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Workplace relationships, psychological capital, employees' performance, accreditation and safety culture: the case of healthcare professionals in Italian acute care settings

Elisabetta Flora Olga Trinchero
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Workplace relationships, psychological capital, employees’ performance, accreditation and safety culture: the case of healthcare professionals in Italian acute care settings

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This thesis is submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

October 2017
Thesis declaration

I certify that the work presented in this thesis is, to the best of my knowledge and belief, original, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

I acknowledge that I have read and understood the University’s rules, requirements, procedures and policy relating to my higher degree research award and to my thesis. I certify that I have complied with the rules, requirements, procedures and policy of the University (as they may be from time to time).

3 November 2017

Elisabetta Flora Olga Trinchero

Date
Abstract

Patient safety is a crucial issue in healthcare organisations all over the world. The Italian healthcare system is not an exception, and there is a growing agenda to increase safety processes of care. The ability to influence safety culture among clinical staff has been widely recognised as one of the main mechanisms that can be used to affect patients’ outcomes. The thesis identifies the lack of viable safety framework models to assess safety culture within the Italian healthcare sector. Hence, it uses three theoretical frameworks – Blau’s (1964) Social Exchange Theory (SET), Positive Organisational Behaviour (POB) (Luthans, Youssef & Avolio 2007) and Cooper’s (2000) framework of safety culture – to operationalise a new comprehensive model of patient safety culture, and to test whether SET factors (supervisor-employee relationships, supervisor-employee relationships safety-related, and engagement) predict accreditation and safety culture in a causal chain. The main theoretical contribution of the research project is that it uses for the first time SET and POB to conceptualise the impact of workplace relationships on accreditation and safety culture in the healthcare sector. Moreover, it delivers a new structured definition of accreditation culture, and it develops new knowledge about the impact of workplace relationships on psychological, behavioural and situational aspects of accreditation and safety culture in the healthcare sector. Finally, the findings provide healthcare managers with an empirically robust model for examining accreditation and safety culture within Italian hospitals. The research results emphasise the role and responsibilities of hospitals’ top and middle management to guide staff involved in the processes of care in the right direction. The research acknowledges limitations regarding the use of self-report surveys to collect data among professionals in the Italian acute care settings. The choice of this research method relies on the willingness to deliver a model that allows hospitals to run internal, functional, and competitive benchmarking of their results, and the feasibility of the approach was paramount in developing the research design. Since
the reliability of this model has been proven using Italian hospitals’ data, further research is needed to re-test it to confirm the generalisability of the model. Finally, future research should also address and improve the ability of the model to fully capture the psychological component of safety culture, that in the proposed model has been assessed using the Katz-Navon, Naveh and Stern (2005) priority of safety construct, adopted from Zohar (2000) (Trinchero, Farr-Wharton & Brunetto 2017).
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List of publications

List of publications included as part of the thesis

The following publications that have been included as part of the thesis have been double-blind reviewed. I warrant that I have obtained, where necessary, permission from the copyright owners to use my published work in which the copyright is held by another party (see the original document, which is included in the thesis appendix). The statements of the contribution of others that summarise and identify the nature and extent of the intellectual input by my co-authors and by me, signed by my supervisor and by me, are included in the thesis appendix.

The premise of the research was presented in 2015 at the 75th Annual Meeting of the Academy of Management as “Trinchero E., Farr-Wharton B. Psychometric Properties Of The Hospital Survey On Patient Safety Culture: Italian Findings”, and is under review in Safety Science as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. How Safe is Safety Culture Analysis? A qualitative review of previous analyses of Hospital Surveys on Patient Safety Culture (HSPOSC), and a best practice template for future replication using Italian data.”

The first step of the research was presented in 2016 at the 76th Annual Meeting of the Academy of Management as “Trinchero E. A Social Exchange Perspective For Achieving Safety Culture In Healthcare Organizations”, and it is currently under review (minor revision status) in the International Journal of Public Sector Management as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. A Social Exchange Perspective for Achieving Safety Culture in Healthcare Organizations.”

The second step of the research has been published as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. 2017. Workplace relationships, psychological capital, accreditation and

**List of additional publications in journals**

The following publications in journals have been double-blind reviewed.


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Trinchero E., Farr-Wharton B., Psychometric Properties of the Hospital Survey on Patient Safety Culture: Italian Findings, AOM 75th Annual Meeting, Vancouver, 7-11 August 2015

Trinchero E., Farr-Wharton B., The Validity and Reliability of the Agency for Healthcare Research and Quality’s Hospital Survey on Patient Safety Culture. Results from Italy, ANZAM Conference, Sydney, 3-5 December 2014


Trinchero E., Brunetto Y., Borgonovi E., Relationships with Managers and Work Harassment: Italian and Australian Nurses’ Experience, IRSPM Conference, Ottawa 9-11 April 2014

Trinchero E., Brunetto Y., Xerri M., Farr-Wharton R., Shacklock K., Borgonovi E., Do Workplace Relationships Make a Difference? Public and Private Sector Italian and Australian Nurses, ANZAM Conference, Hobart, 4-6 December 2013

Trinchero E., Teo S., Workplace Relationships, Work Harassment and Engagement for Nurses in Italy, AOM 73rd Annual Meeting, Orlando, 9-13 August 2013

Trinchero E., Teo S., Brunetto Y., Borgonovi E., Training and Development, Employee Engagement and Job Satisfaction for Italian Registered Nurses: A SET Perspective, IRSPM Conference, Prague, 10-12 April 2013

Trinchero E., Brunetto Y., Borgonovi E., Examining the Antecedents of Engaged Nurses in Italy: Perceived Organisational Support; Satisfaction with
TRAINING AND DEVELOPMENT AND DISCRETIONARY POWER, ANZAM CONFERENCE, PERTH, 5-7 DECEMBER 2012

Trinchero E., Filannino C., Borgonovi E., LEADER-MEMBER EXCHANGE AND AFFECTIVE COMMITMENT, ENGAGEMENT, WELLBEING, INTENTION TO TURNOVER: THE ITALIAN FINDINGS, IRSPM CONFERENCE, ROMA, 11-13 APRIL 2012

Trinchero E., Brusoni M., TRENDS IN SAFETY ASSURANCE ORGANISATIONAL MODELS AND PATIENT SAFETY MANAGERS (PSMs) COMPETENCIES AND PROFILE: AN EMPIRICAL ANALYSIS IN ITALIAN HOSPITALS (POSTER), ISQUA CONFERENCE, HONG KONG, 14-17 SEPTEMBER 2011
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1. Introduction

Safety in healthcare organisations is an emerging concern throughout the world. Since the late twentieth century, beginning with the report *To Err Is Human* (Kohn, Corrigan & Donaldson 1999), the Institute of Medicine (IOM) identified the need to create a *safety culture* within healthcare organisations. As Flin (2007) argues, a growing number of studies are dealing with the analysis of safety climate and culture in high-risk, complex organisations – such as healthcare organisations – as a consequence of the increasing attention gained world-wide by patient safety issues (e.g., among others, in the USA, Andrews et al. 1997; in Australia, Neal, Griffin & Hart 2000; and in the UK, Vincent, Neale & Woloshynowycz 2001). Although the relevance of safety culture for high-risk organisations is increasingly becoming evident, “the concept still has not advanced beyond its first developmental stages” (Guldenmund 2000, p. 216). An evidence-based model embedded in the literature is needed to assess the safety culture within an organisation and the correlation with the safety performance measures (Guldenmund 2000). Furthermore, as Richter and Koch (2004) and Hale (2004) point out, agreeing with Guldenmund, a consensus on the concept of safety culture has not been reached among scholars (e.g. Choudhry, Fang & Mohamed 2007b; Guldenmund 2000; Haukelid 2008). Hence, the study of safety outcomes in healthcare is in its infancy.

However, there is still a debate about the relationship between the concept of organisational culture and the concept of safety culture (e.g. Choudhry, Fang & Mohamed 2007b; Cole, Stevens-Adams & Wenner 2013; Guldenmund 2000). All authors agree about the existence of a relationship between organisational culture and safety culture; however, there is disagreement about whether there is a causal link between safety culture and the organisational system (e.g. Davies et al. 2003; Reason 1997). While Guldenmund (2000)
notes that the first study on safety climate was by Keenan et al. (1951), the first use of the safety culture concept came from the analysis of the nuclear explosion at Chernobyl in 1986 (Choudhry, Fang & Mohamed 2007b; Cole, Stevens-Adams & Wenner 2013; Wiegmann et al. 2002). The International Safety Advisory Group (ISAG) of the International Atomic Energy Agency (IAEA) referred among other things to a poor safety culture as one of the causes of the Chernobyl nuclear accident (International Nuclear Safety Advisory Group 1988). Also pointed out by Choudhry (2007b, p. 996), “the concept of safety culture has not developed theoretically from the organisational culture”. As noted in Trincherò et al. (2015), scientific literature talks about an ongoing debate on how to define safety culture and on the distinction between safety culture and safety climate (e.g. Choudhry, Fang & Mohamed 2007b; Cole, Stevens-Adams & Wenner 2013; Flin 2007; Guldenmund 2000; Scott, T et al. 2003). Moreover, Hofmann and Morgeson (1999) raised attention to the fact that the workplace relationships of employees with management on safety culture had received little attention. Despite the growing relevance of safety issues for healthcare organisations after 1999 and its strong connections to safety culture, Vogus, Sutcliffe and Weick (2010) argue that a decade later, there still appears to be a lack of research about how workplace relationships impact the effectiveness of safety culture within hospitals.

This research project addresses the safety culture issue as an essential characteristic of the organisational environment where safety solutions could effectively be adopted and embedded in the day-to-day activity. In spite of the fact that creating a safety culture is one of the most difficult and critical tasks for healthcare organisations’ top management (Roberts, KH & Rousseau 1989), few Chief Executive Officers invest sufficient time and resources on patient safety culture (Leape & Berwick 2005). In other industries, such as aviation, studies on leadership show clearly the importance of the leadership spreading an effective safety (e.g. Bodega 2002).
Although the majority of healthcare organisations seem to face problems in the process of aligning safety culture with organisational goals, there is still a lack of empirical research about patient safety culture. Therefore, it is important to develop an understanding of the role that organisational management plays, when attempting to develop an environment that fosters safe workplaces and safe practices in healthcare organisations.

Patient safety is a crucial issue in healthcare organisations all over the world, especially with regard to acute care settings, where the patients have the greatest potential to be harmed. The Italian healthcare system is not an exception and there is a growing agenda to increase safety processes of care. The ability to influence safety culture among clinical staff has been widely recognised as one of the main mechanisms that can be used to influence patients’ outcomes. In order to assess the depth and breadth of this issue, a usable, validated and widely accepted instrument is required, because only then will doctors get involved in the matter. This chapter provides an overview of the existing safety theories, and outlines the objectives of the research, the aims of the study and poses the primary research questions. The chapter ends with the potential contributions to the literature and implications for practice.

1.1 A critical review of existing safety theories

In the absence of a theoretically embedded and empirically tested model to address safety within healthcare organisations, this thesis firstly critically reviews and debates the merits of the existing schools of thought about safety within complex organisations. This is then followed by the identification of the gaps in the literature that is addressed in the thesis. The next section analyses the existing safety approaches.

Safety is considered a priority in several high-risk industries nowadays, such as aviation, nuclear and military sectors. Sagan (1993) identifies two main competing schools of thought about safety within complex organisations: the High-Reliability Theory (so-called
HRT, that relies on proper organisational design and management to achieve safety outcomes even in potentially high-risk contexts), and the Normal Accidents Theory (so-called NAT, that considers severe accidents unavoidable within organisations with complex and interdependent processes). The relationship between HRT and NAT can be considered from several viewpoints. Some authors (Perrow 1999; Shrivastava, Sonpar & Pazzaglia 2009; Tamuz & Harrison 2006; Weick 2004) believe that HRT and NAT have complementary perspectives. On the other hand, other researchers (e.g. Weick, Sutcliffe & Obstfeld 1999) consider NAT scholars as critics of HRT, particularly in relation to the relevance of characteristics like redundancy, training, and safety culture. Finally, while HRT focuses on the consequences on the safety of an organisation’s safety culture (Roberts, KH & Rousseau 1989; Weick & Sutcliffe 2007), NAT (Sagan 1993) focuses on the consequences of the safety of system characteristics such as coupling, interactive complexity, and politics. In addition, a different approach compared to NAT and to High-Reliability Organisations (so-called HROs) theory, which is based on systems theory, was developed by researchers (Hollnagel 2002; Leveson 2004; Rasmussen 1997; Woods & Cook 2002) with a background in system engineering and human factors.

Human factor studies traditionally deal with the way the interactions between man and machinery can be planned so that people perform their tasks in the most efficient and the safest way possible (Roberts, KH 2009). The systemic approach assumes that accidents depend on the interaction between system components, and it conceptualises the system as a whole, not as individual components. In other words, this approach focuses on the analysis and design of the whole of the relationship amongst different parts of the system, and how these parts interact and adapt to each other.

The focus of the systemic approach is not only on people’s characteristics (skills, competencies and psychological characteristics) and on teams (coordination, institutional
awareness, sharing of a reference framework), but also on interactions between ‘man and machinery’, environmental layout, and quality of training programs (Rasmussen 1986). The model, based on systems theory, considers accidents as a consequence of an interaction between system components and does not look for a single variable or factor (Rasmussen, Duncan & Leplat 1987). The principle is that the prevention of accidents should be holistic and based on a social and technical approach which mixes the theory of social systems with engineering systems, resulting in a dynamic model that makes organisational systems resilient enough to avoid unacceptable risks (Rasmussen 1997; Reason 1997).

The social systems approach presumes that adopting a systemic and organisational perspective can influence healthcare risks (Reason 2000; Sexton, Thomas & Helmreich 2000). This socio-technical approach highlights some important changes in the nature of systems and technologies that require further studies to develop new models to understand accidents, to prevent them, and to provide risk assessment techniques more suitable for the complexity of the new phenomenon. These changes are: (i) fast technological changes; (ii) changes in the nature of accidents; (iii) decreasing of tolerance for each accident; (iv) increasing of complexity and interconnections; (v) increasingly complex relations between man and automation; and (vi) changes in regulation (Leveson 2004). This approach is based mostly on the complex relations between events (feedback and indirect relations) that should be taken into account to better understand why accidents happen. The systems theory has been developed as an alternative model to the simple linear system models or cause-effect chains model (Heinrich 1959), which considers events as coming from a chain of events each directly linked in a random order. The main criticism of the cause-effect chain’s model is that it does not take into account the impact of technological changes, cognitively complex and distributed decision-making processes, organisational, and cultural factors (Lundberg, Rollenhagen & Hollnagel 2009).
1.1.1 Normal Accident Theory

The normal accident theory (NAT) (Perrow 1984) starts from the idea that accidents are unavoidable (normal) in complex high-risk systems. Perrow (1984) classifies the productive technological environment as comprising four levels: the single component or part (first level); the unit, made by a group of functionally connected individual parts (second level); the subsystem, made up of combined units (third level); and the system, made up of merged subsystems (fourth level). Any unintentional, unplanned and adverse event that causes a process interruption at the first two levels is called an incident, while any failure at the third and fourth level is called an accident. The design of effective engineered safety features (ESF) – for instance, redundant components, and emergency shut-offs – has a key role of limiting the probability that an incident can escalate to an accident. For instance, in Italian hospitals, fire-resistant inner doors are a reliable protection mechanism required to provide a barrier so that flames and smoke cannot easily pass between rooms; hence a fire that develops in one area has less probability of affecting the entire building.

Perrow (1984, 1994) also introduces the concepts of linear/complex interactions (related to: (i) the degree of knowledge and prevision’s competencies of the interactions’ sequence, and (ii) the ability to intercept unplanned and unexpected interactions of the different parts, which might result from frequently changing conditions, high interdependence, dynamic effect, and complex loops) and loose/tight coupling (related to the degree of dependence among system components, such as, for instance, procedures and equipment) as the system properties that influence the probability of accidents. Perrow (1984) highlights that it is the presence of the two factors that generates the risk of catastrophic chains. Using this framework, numerous types of organisations (among others healthcare organisations) could be included, even if they don’t deal with the immediate risk of endangering human life (Davies et al. 2003; Perrow 1984; Weick & Sutcliffe 2001).
NAT’s approach has the advantage of focusing on the organisation instead of on the individuals when dealing with errors, but it also has the disadvantage of not taking into account the “human factor” impact on processes (Shrivastava, Sonpar & Pazzaglia 2009). This led to some concerns among scholars about NAT’s ability to describe an organisation or a socio-technical environment (Shrivastava, Sonpar & Pazzaglia 2009).

Moreover, the intra-system “ambiguities, since one could argue interminably over the dividing line between part, unit, and subsystem” (Perrow 1984, p. 65) offers a framework which is open to misinterpretations (Hopkins, A 1999). Rigorously using Perrow’s definition and classification of accidents, system accidents seems to be extremely rare (Shrivastava, Sonpar & Pazzaglia 2009). Based on these considerations, scholars criticise the relevance of the theory (Hopkins, A 1999; Shrivastava, Sonpar & Pazzaglia 2009).

1.1.2 High-Reliability Theory

Following the High-Reliability Theory (HRT), those organisations that achieve successful performances in complex environments with very low levels of failure are generally called High-Reliability Organisations (Larrabee et al. 2003; Weick & Sutcliffe 2001; Weick & Sutcliffe 2007). Weick and Sutcliffe (2001) state that an organisation can be called a High-Reliability Organisation (HRO) when it operates in a complex environment where an error can have catastrophic consequences, but it has been error-free for thousands of operations (at least 100,000,000). These organisations can operate in highly difficult and often hostile environments, keeping the risk of malfunctions as low as possible, and therefore avoiding catastrophic consequences: their priority is safety, knowing that organisational factors, managerial approaches and behavioural models – that is the cultural context together with the individual human factors – are the main causes of accidents (Shrivastava, Sonpar & Pazzaglia 2009).

Furthermore, HRT scholars (Weick 1987; Weick & Roberts 1993; Weick & Sutcliffe
Weick & Sutcliffe 2007; Weick, Sutcliffe & Obstfeld 1999) introduce the concept of collective mindfulness as a mechanism of group activities coordination and a behaviour based on people’s actions that allow HRO to manage the unexpected. In other words, individuals carry out their tasks (contribution) keeping in mind collective actions system (understanding). Therefore they coordinate their actions according to the representation they have of such a system (subordination).

It is important to notice that collective mindfulness is not a separate or autonomous entity that drives people’s actions. On the contrary, it is the actions themselves that create the collective mindfulness. It develops using the gathering of all shared experiences that come from the members of the group and it shows through a sometimes unconscious coordination of actions of the group. In particular, Weick, Sutcliffe & Obstfeld (1999) suggest that management should pay attention to five factors of mindfulness to increase staff capability to discover and manage unexpected events in order to enhance organisation reliability. They are: (i) preoccupation with failure; (ii) reluctance to simplify interpretations; (iii) sensitivity to operations; (iv) commitment to resilience; and (v) deference to expertise associated with decision-making autonomy to face an emergency. Of these factors, the first three aim at anticipating and preventing unexpected events; the other two aim at minimising unexpected events once they’ve occurred (Weick 2004; Weick, Sutcliffe & Obstfeld 1999).

However, the HRT has three main flaws. The first one is that it can only be used in retrospect. The second one is that the definition of operation is not clear: even in the aviation sector, commonly used as an example of HRO, there is still an open debate about the meaning of the operation, and some authors believe that ‘operation’ refers to an entire flight. However, others use the term to refer to only one of several flight processes, and further still, others use the term to mean one of the elementary operations carried out by all individuals involved (e.g. O’Neil & Kriz 2013; Rochlin, La Porte & Roberts 1987). The third one is that
the definition of reliability is not explicitly defined (e.g. Hopkins, A 2007; Wolf 2001), although HRT scholars refer to that as “the ability to maintain and execute error-free operations” (Shrivastava, Sonpar & Pazzaglia 2009, p. 1363).

Moreover, Scott (1994) argues that there is a lack of connection between HRT and mainstream organisation theory, and Schrivastava et al. (2009) attribute that to the lack of a theoretical anchor, questioning the assumption of the applicability of micro-level cognition process at the macro-level done by HRT scholars (e.g. Weick & Sutcliffe 2001; Weick, Sutcliffe & Obstfeld 1999). Therefore, the weaknesses of this approach lead to the present research, which aimed to develop an evidence-based, empirically-tested safety model suitable for healthcare settings, developed and tested for Italian acute care hospitals.

1.1.3 Healthcare organisations and HRO

Aviation companies, air traffic control systems, nuclear plants, petrochemical processing, energy production and distribution systems are examples of organisations which are characterised by both interactive complexity and tight coupling, and have proven to be able to function as an HRO organisation. Based on the work of Reason (1997), all these companies do not belong to a specific sector, but they all share the same characteristics. Namely, the HRO organisations have to manage an increasingly complex technology; have the need for an appropriate use of knowledge; have the need for specialised management; require the presence of a variety of specialised skills and high operational competencies; and require a widespread strong non-authoritative and no blame culture, that encourages communication and sharing of opinions (Reason 1997).

Healthcare organisations can also be defined as highly risky organisations. Their activities, which take place in a very complex environment where models are often uncertain and stochastic, can lead to accidents that can put human lives at risk. They are complex organisations that operate with tight coupling, and the cost of an error or operational failure is
several orders of magnitude higher than the benefit coming from the lesson learned (Reason, Carthey & de Leval 2001). Examples are the loss of human lives, and the psychological consequences for the people involved in the accident, as recently detailed in a large analysis of the medical malpractice phenomenon in Italy (Bonetti et al. 2016).

As a first step, it is relevant to look at similarities and differences between High-Reliability Organisations and healthcare organisations. Accepting the definition of HRO, and considering it as a desirable framework, then it can be used also for healthcare organisations, even if there is a debate as to whether healthcare organisations are HROs (Tamuz & Harrison 2006). As stated, healthcare provision is a highly complex sector and is subject to the risk of error: it carries out 24 hours of activities; it requires a high level of specialisation; processes are often complex and competencies are cross-curricular. Thus, errors can have catastrophic consequences (Trinchero & Lega 2016). These characteristics make some authors (Gaba 2000; Leape & Berwick 2005; Meyer, AD 1982; Tamuz & Harrison 2006; Thomas & Helmreich 2002) consider whether the healthcare sector is more complex or unpredictable than the organisation that flies aircraft carriers because possibly the working conditions are less predictable. These authors challenge the assumption that healthcare organisations can be analysed through the HRT lens, because of the working environment, the complexity, the unpredictability, and the possibility of failure and its consequences in the healthcare sector being very different from other industries.

Hence a gap has formed between healthcare organisations and HROs because hospitals are often professional bureaucracies (Mintzberg 1979), where norms and routines are learned through a process of professional socialisation and authority runs through professional hierarchies (Tamuz & Harrison 2006). Furthermore, using the HRO framework, in certain environments and under certain circumstances (such as facing an emergency or managing an unexpected outcome) a shift in decision-making authority is expected, and such
a shift is not possible in a hospital system (Meyer, AD 1982).

Hospitals are not usually the best places for developing an integrated and shared culture of understanding about reliability, because whilst they work in an extremely complex environment, unlike HROs, hospital managers pursue a wide range of objectives, very often conflicting: clinical aims and medical practices can be very different to the safety and quality aims of hospital management (Gaba 2000). Hence it seems that the HRO’s framework has limited applicability in the healthcare domain.

Hospitals very often have different coexisting sub-cultures that mirror the complexity of the healthcare system in general (Sexton & Klinect 2001; Singer et al. 2003). This is because different groups of professionals with different, but complementary, bodies of knowledge operate side by side within hospitals. Furthermore, some beliefs and professional norms clash with norms that are specific to HROs (Thomas & Helmreich 2002). Some examples of where the clashes occur are in relation to: (i) clinical expertise, that promotes professional hierarchies and individual responsibility rather than a ‘non-punishing’ learning based on teamwork (Tucker, AL & Edmondson 2003); (ii) policies that do not support error reporting systems; and (iii) a system that does not encourage people to discuss and learn from mistakes (Gaba 2000).

Moreover, as Lingard (2004) argues, many technical and social aspects in a hospital are redundant, but this does not always mean an improvement in safety and reliability. Studies about human factors have identified the potential human fallibility because people are not rational machines: instead, they operate with cognitive limits and they can fail in uncertain situations. However, the aim of organisations is to plan reliable systems based on catering for unreliable elements. Redundancy of some elements is, therefore, a possible organisational strategy, which can avoid the possibility of failure of a single element. The possibility of making a decision using multiple and independent channels can produce, in
theory, a totally reliable system, even if each element of the organisation is subject to failure (Catino 2006; Sagan 1993). As a matter of fact, if more than one element follows the same process simultaneously, there is a higher chance of detection of a problem in a shorter time than the time needed by only one control system. Redundancy of units, which perform exactly the same task and overlap, can enhance system reliability.

However, if redundancy is a way to reduce the above-mentioned dangers, it can create, on the other hand, a less straightforward system for the workers. Furthermore, if redundancy enhances system safety, and workers perceive this, it can also push workers to increase production to more dangerous levels. In other words, while enhancing the safety level of a single operation, it can unintentionally enhance the overall danger level of the entire system (Catino 2006). For example, using checklists, very often suggested as a step during which complex and difficult processes can be verified (such as before surgery, i.e. timeout checklist), can be essential to reduce error margins, but it can also slow down decision-making processes and concrete actions that doctors and nurses must take in complex and emergency conditions, thereby threatening patient safety (Trinchero & Lega 2016). A balance is often chosen such that tools and procedures are used to reduce error margins, but never at the expense of slowing down or compromising the entire system (Haugen et al. 2013), and in turn, this further identifies the limit of HRO as a framework for ensuring safety outcomes in healthcare organisations.

While there is evidence of the healthcare sector comprising so-called ‘high-reliability teams’ (such as certain teams in the surgery room), researchers argue that healthcare organisations as a whole are not true High-Reliability Organisations (Gauthier, Davis & Schoenbaum 2006). Following Resar (2006), the healthcare system, compared to proven HRO, has a low level of reliability due to the following reasons: (i) processes are seldom planned based on having specific and complex reliability objectives; (ii) a relatively tolerant
attitude in terms of operational autonomy creates uncontrolled areas, intrinsically dangerous, of variation from the standard norms; (iii) improving actions that aim to guarantee patient safety are often hindered by excessive workload. Furthermore, there is often not enough time to consolidate the changes.

Considering what has been said so far, comparisons between healthcare organisations and HRO should be done very carefully. The so-called ‘proven’ HRO works on the basis of adequate models of the entire system, meaning the people, procedures and organisation, technology and physical environment operating to achieve the objectives of an HRO (Canato et al. 2004), in order to anticipate and manage unpredictable situations. This is not easily achievable within a healthcare system. However, professional staff (i.e. nurses and doctors), as in all HROs, deal with very similar problems, such as: (i) unpredictability and variety of situations and problems to be faced; (ii) importance of knowledge based on experience and intuition; (iii) limited possibility to anticipate and plan; and (iv) need to take action, change things and make decisions on the spot (Reason, Carthey & de Leval 2001). In order to work effectively on patient safety, many healthcare organisations all over the world are trying to implement some of the HRO characteristics, as these organisations have proven ability to be very reliable even in complex environments (e.g. Van Stralen et al. 2008). For instance, as Roberts (2009) points out, Leonard, Graham and Bonacom (2004) introduced into a healthcare setting HRO values and tools such as surgical briefing, critical event training and simulation, and standardised communication among staff.

1.1.4 Healthcare organisations and safety culture

Some of the building blocks of the HRT can be useful in creating a safer environment within the healthcare sector. The most relevant seems to be the aptitude to create a pervasive safety culture within the organisation as a step forward towards reducing unreliability or towards gradual safety institutionalisation (Weick, Sutcliffe & Obstfeld 1999). In the past few
years, the promotion of a culture of safety has become, in the developed countries, one of the key issues in the healthcare sector (Spurgeon et al. 2017). Improvement of patient safety has become a priority worldwide, and the Institute of Medicine (IOM) in the last almost 20 years has issued recommendations so that the healthcare system works towards an improvement of the culture of patient safety in hospitals.

For this reason, research has examined how to improve the culture and climate of safety in hospitals (Kohn, Corrigan & Donaldson 1999). The safety culture of an organisation has been defined by the Advisory Committee on the Safety of Nuclear Installation (ACSNI) as:

the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety management (ACSNI 1993, p. 23).

With the aim of investigating safety culture and climate within healthcare organisations, and in particular on patient safety, research was conducted at the end of the '90s. Two reports: the US “To err is human” (Kohn, Corrigan & Donaldson 1999), and the English “An organisation with a memory” (Department of Health 2000) show the key role of organisational culture in preventing unpredictable events, errors or accidents. It is generally thought that a positive safety culture can significantly reduce errors and accidents within healthcare organisations (Nieva & Sorra 2003). However, patient safety improvement is a tough challenge, because it requires several complex changes in the organisational dimensions involved in the healthcare system. Improvements of patient safety require substantial changes in working processes (Campbell & Thompson 2004; Chamberlain-Webber 2004). Following Sorra and Dyer (2010), patient safety culture refers to management and staff values, beliefs, and norms about what is important in healthcare organisation, how staff are expected to behave, what attitudes and actions are appropriate, and what processes
and procedures are rewarded and punished with regard to patient safety.

1.2 Overview, objectives and research questions

In the followings section, the aims of the study are presented and the structure of the research is outlined, with a particular focus on the premise, the first, and the second step of the research. Then a justification of the study is detailed, along with the contributions to literature and implications for practice.

1.2.1 Aim of the study

The thesis identifies the lack of viable safety framework models to assess safety culture within the Italian healthcare sector. Hence, it uses three theoretical frameworks – Blau’s (1964) Social Exchange Theory (SET), Positive Organisational Behaviour (POB) (Luthans, Youssef & Avolio 2007) and Cooper’s (2000) framework of safety culture – to operationalise a new comprehensive model of patient safety culture, and to test whether SET factors (supervisor-employee relationships, supervisor-employee relationships safety-related, and engagement) predict accreditation and safety culture in a causal chain (see Figure 1-2).

Social Exchange Theory (SET) is based on the premise that when one party creates an advantage for another party, an implicit obligation for forthcoming reciprocity is created (Blau 1964; Gouldner 1960). SET argues that workplace relationships benefit not only the employee (by improving access to resources, information, respect), but also the organisation and patient (the patient benefits from better treatment given by healthcare professionals who can access help in diagnosing patient needs). Consequently, a better understanding of the impact of social exchange relationships (Leader-Member-Exchange – LMX, LMX safety-related – Safety LMX, and engagement) on employees’ behaviours can provide a lens for understanding safety culture. LMX has been defined as
(a) a system of components and their relationships (b) in both members of a dyad (c) involving interdependent patterns of behavior and (d) sharing mutual outcome instrumentalities and (e) producing conceptions of environments, cause maps, and value” (Scandura, T.A., Graen & Novak 1986, p. 580).

Engagement at work has been defined as the employees’ obligation to fulfil their role to recompense the resources received from the organisation (Kahn 1990).

In the last years some scholars have used a SET framework to examine organisational safety issues (DeJoy et al. 2010; Didla, Mearns & Flin 2009; Hofmann & Morgeson 1999; Hofmann, Morgeson & Gerras 2003; Kath, Marks & Ranney 2010; Mearns & Reader 2008; Michael et al. 2005; Michael et al. 2006; Tucker, S et al. 2008), although mostly not in the healthcare sector (Brunetto, Farr-Wharton & Shacklock 2011a; Mark, Hughes & Jones 2004), and especially not in the Italian healthcare sector.

POB has been selected, since it provides a framework for examining the impact of individuals’ personal attributes on behaviours and outcomes (Luthans, Youssef & Avolio 2007), including safety outcomes (Eid et al. 2012). POB refers to “the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today’s workplace” (Luthans 2002, p. 59). The psychological capacities that meet those criteria are hope, efficacy, resilience, and optimism, and have been defined as psychological capital (PsyCap) (Luthans, Luthans & Luthans 2004). The PsyCap variable is explained in details in Chapter 3. In line with Eid et al. (2012) and their approach to embedding psychological characteristics studied by Luthans, Youssef and Avolio (2007) for HRO’ industries such as offshore oil and gas, this study also includes them in the examination of the safety culture within the healthcare sector.

Together SET and POB theoretical frameworks provide relevant variables as a platform on which Cooper’s variables can be embedded. Accreditation and safety culture are
operationalised using Cooper’s (2000) model of safety culture, which is in turn based on Bandura’s (1986) model of reciprocal determinism (which means that employees’ work practices are influenced by an interplay of management policies, directives, and role modelling, as well as the environment in which they operate and vice versa). Consequently, the model comprises three dimensions: psychological, behavioural and situational, which Cooper (2000) argues captures safety culture. In particular, the psychological aspect of safety captures the socio-emotional state (feelings) of employees, the behavioural aspect captures the safety behaviours, and the situational aspect captures the policies, procedures, management structures and responsibilities related to safety outcomes. This model has also been used to capture accreditation culture.

This thesis addresses a void in the literature by assessing the reliability of one the most used tools assessing safety culture within healthcare organisations, and operationalising a new comprehensive model of patient safety culture and by testing whether SET factors (supervisor-employee relationships, supervisor-employee relationships safety related and engagement) and POB predict accreditation and safety culture in a causal chain amongst healthcare professionals in acute healthcare settings.

Figure 1-1 – Aim of the study

The thesis incorporates publications, and the research project presented has the following structure:

- a premise, which was presented in 2015 at the 75th Annual Meeting of the Academy of Management as “Trinchero E., Farr-Wharton B., Psychometric Properties Of The Hospital Survey On Patient Safety Culture: Italian Findings”, and is under review in Safety Science as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. How Safe is Safety Culture Analysis? A qualitative review of previous analyses of Hospital Surveys on Patient Safety
Culture (HSPOSC), and a best practice template for future replication using Italian data”;

- a first step, which was presented in 2016 at the 76th Annual Meeting of the Academy of Management as “Trinchero E., A Social Exchange Perspective For Achieving Safety Culture In Healthcare Organizations”, is currently under review (revise and resubmit status) in the International Journal of Public Sector Management as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. A Social Exchange Perspective for Achieving Safety Culture in Healthcare Organizations”;


The premise of the research aims to assess the low reliability, using Italian hospitals’ data, of the US’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture (HSPOSC) (Nieva & Sorra 2003), one of the most frequently applied, and industry-accessible, tools for interrogating hospitals’ safety culture worldwide.

The first step of the research investigates how LMX and engagement affect the situational, psychological, and behavioural aspects of safety culture. Hence, the research question guiding data collection is:

**Research Question 1: What is the impact of LMX upon healthcare professionals’ perception of engagement, and in turn, upon the quality of psychological, behavioural and
The second step of the research investigates how Safety LMX and PsyCap affect accreditation culture as a second order variable (comprising situational, psychological and behavioural components variables) and safety culture as a second order variable (comprising situational, psychological and behavioural components variables). Hence, the research questions guiding data collection are:

**Research Question 2:** What is the impact of LMX safety-related on accreditation culture in Italian acute care hospitals?

**Research Question 3:** What is the impact of Positive Organisational Behaviour (Psychological capital) on accreditation culture in Italian acute care hospitals?

**Research Question 4:** What is the impact of accreditation culture on safety culture in Italian acute care hospitals?

### 1.2.2 Contributions to literature and implications for practice

This research project will develop new theoretical and methodological knowledge. Moreover, it will deliver a more comprehensive blueprint for understanding the role of workplace relationships and employee attributes on safety outcomes and this new evidence-based knowledge can be used to improve managerial practice.

In terms of the development of new theoretical knowledge, this is the first time that both SET and POB have been used to conceptualise the impact of workplace relationships and individual attributes on accreditation and safety culture in the healthcare sector. Hence, this PhD study extends the use of SET and POB as a platform on which Cooper’s conceptual framework is embedded. Individually, SET and POB provide a platform on which safety processes are embedded (to a varying degree). Together, they provide a more comprehensive lens for examining the impact of individual attributes and workplace processes on
psychological, behavioural and situational aspects of accreditation and safety culture in the healthcare sector.

In terms of the development of new conceptual framework, this research will develop new knowledge about specific factors that capture the impact of workplace relationships and psychological capital on the psychological, behavioural and situational aspects of accreditation and safety culture in the healthcare sector. Moreover, it delivers a new structured definition of accreditation culture; and in turn, its impact on safety behaviour.

Additionally, in terms of the development of new methodological tools, this study will test the validity and reliability of the tool that is most commonly used in healthcare organisations around the world: the so-called ‘Hospital Surveys on Patient Safety Culture’ (HSPOSC) instrument, funded by the US Agency for Healthcare Research and Quality (AHRQ) (Nieva & Sorra 2003).

Finally, with respect to the implications for evidence-based best practice, the finding of this research project will provide healthcare managers with an empirically robust model for examining accreditation and safety culture within Italian hospitals in particular, thereby adding new information about how healthcare managers can improve compliance of safety behaviour among healthcare professions. This has not been done before and therefore this research will provide a starting point for further research to assist hospitals to increase their understanding and commitment to safety.

1.3 Summary

The first chapter outlined broadly the main safety theories, and presented the objectives of the research, the aims of the study and posed the primary research questions, ending with the potential contributions to the literature and implications for practice. For a synthetic and comprehensive view of the research questions, see Table 1-1.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>RQ 1</td>
<td>What is the impact of LMX upon healthcare professionals’ perception of engagement, and in turn, upon the quality of psychological, behavioural and situational aspects of safety culture in Italian acute care hospitals?</td>
</tr>
<tr>
<td>RQ 2</td>
<td>What is the impact of LMX safety-related on accreditation culture in Italian acute care hospitals?</td>
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<tr>
<td>RQ 3</td>
<td>What is the impact of Positive Organisational Behaviour (psychological capital) on accreditation culture in Italian acute care hospitals?</td>
</tr>
<tr>
<td>RQ 4</td>
<td>What is the impact of accreditation culture on safety culture in Italian acute care hospitals?</td>
</tr>
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</table>
2. Theoretical framework

2.1 Introduction

This chapter presents the theoretical frameworks that have been used and the concepts that have been analysed in the thesis. This thesis uses three theoretical frameworks – Blau’s (1964) Social Exchange Theory (SET), Positive Organisational Behaviour (POB) (Luthans, Youssef & Avolio 2007), and Cooper’s (2000) framework of safety culture – to operationalise a new comprehensive model of accreditation and safety culture, and to test whether SET factors (supervisor-employee relationships and engagement) and POB predict accreditation and safety culture in a causal chain, within healthcare organisations.

SET focuses on the benefits from positive social interaction within an organisation between employees, managers and the organisation itself, based on the principle of mutual reciprocity, which can potentially generate long-term benefits for all the stakeholders (Cropanzano & Mitchell 2005). When interactions between colleagues are not based on trust and respect, employees undertake tasks at work based on the economic contract between themselves and their employer. In contrast, when effective interaction occurs in the workplace, the benefits for the employee, the supervisor and the organisation, far exceed those outlined in the economic contract.

Positive organisational behaviour is “the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today’s workplace” (Luthans 2002, p. 59). Implementing positive psychological staff capacities is relevant to high-risk organisations to achieve safer performances because practices consistent with POB actively encourage safe behaviour (Eid et al. 2012).
Cooper’s (2000) model of safety culture argues that safety culture comprises three dimensions: psychological (capturing employees’ attitudes and perceptions about safety policies), behavioural (capturing “observable ongoing safety-related behaviours”), and situational (capturing “safety management system audits/inspections”). Cooper (2000) argued that in combination, the three dimensions provided a means of measuring and benchmarking safety culture across industries. The implication of this research is that there are real benefits for all stakeholders from embedding effective workplace relationships within healthcare organisations. The criticism of the framework is that when used alone, it fails to capture how the workplace relationships and individual attributes impact employees’ safety culture (Trinchero, Farr-Wharton & Brunetto 2017).

2.2 Social Exchange Theory

“Social Exchange Theory (SET) is among the most influential conceptual paradigms for understanding workplace behaviour” (Cropanzano & Mitchell 2005, pp. 874-5) and “may well have the potential to provide a unitary framework for much of organisational behaviour”. SET focuses on the benefits derived from interaction within an organisation between employees, managers and the organisation itself, based on the principle of reciprocity, which can possibly create a continuum of high-quality relationships that generate long-term benefits for all the stakeholders.

Existing SET literature shows that numerous researchers have studied the impact of supervisor-employee and organisation-employee social interaction and exchange on organisational safety issues (DeJoy et al. 2010; Didla, Mearns & Flin 2009; Hofmann & Morgeson 1999; Hofmann, Morgeson & Gerras 2003; Kath, Marks & Ranney 2010; Mearns & Reader 2008; Michael et al. 2005; Michael et al. 2006; Tucker, S et al. 2008) – but mostly not in the healthcare sector, and especially not in Italy. An exception is Brunetto et al. (2016)
research, which examines the impact of nurses’ supervisor support on nurses’ safety performance in the Australian healthcare sector.

### 2.2.1 The SET evolution through the last century

Malinowski (1932) states that the principle of reciprocity has its roots within the theory of conformity because it refers to a system of mutual and contingent obligations between people within an exchange of equivalent benefits or gratification (that is services or goods), based on “folk beliefs” rules. As Parsons (1951, p. 21) argues, “reciprocity is inherent in the nature of social interactions”, and the base principle is that as long as the exchanges continue to occur in a balanced way, then the relationship continues.

Gouldner (1960, p. 169) points out that Parsons uses “reciprocity” as synonymous of “complementarity”, while “complementarity connotes that one’s rights are another’s obligations, and vice versa [and] reciprocity […] connotes that each party has rights and duties”. Furthermore, Gouldner (1960, p. 171) proposes the following universal, interconnected basic rules of the norm of reciprocity: “people should help those who have helped them, and people should not injure those who have helped them”. After identifying that the rules of reciprocity are learned in childhood, he has explored the concepts of (functional) reciprocity, mutual contingency, and functional autonomy within the exchange process, defining reciprocity as a transaction that stabilises patterns. Moreover, Gouldner (1960) focuses on employee behaviour in workplace-based reciprocity, observing that working relationships based on reciprocity that evolve positively over time will develop behaviour that, within an organisation, benefits employees, management, and the organisation itself.

Homans (1961, p. 13) defined processes of social association “as an exchange of activity, tangible or intangible, and more or less rewarding or costly, between at least two
persons”. The extrinsic benefits of the exchange process decrease with the number of the exchanges (Homans 1961). Starting from Gouldner’s (1960) and Homans’ (1961) theory of reciprocity, Blau (1964) developed a more in-depth understanding of social exchange theory.

While Homans (1961) focused on the analysis of the psychological principles that inform how the individual behaves, Blau (1964) focused his studies on the reciprocal processes that constitute exchanges and on the unspecified time period when future exchange might take place. Blau (1964, p. 89) conceptualised the principles of (direct) social exchange as follows: “an individual who [voluntarily] supplies rewarding services to another obligates him. To discharge this obligation, the second must furnish benefits to the first in turn.” Blau’s (1964) focus is not only on the reward, but also on the extrinsic benefits of the exchange process. Those studies build the framework of social exchange theory.

Sahlins (1972), then, introduces the concept of the “process of reciprocity”, providing a basis for the theoretical explanation of the differences between social and economic exchange. More specifically, Sahlins’ research identifies a continuum of balanced exchange that starts from an ideal situation of balanced reciprocity based on a completely undefined exchange without expectation [social exchange relationship] and ends with an ideal situation of balanced reciprocity based on a direct and formalised exchange [economic exchange relationship].

Referring to resources exchanged, the resource theory (Foa & Foa 1974; Foa & Foa 1980) identified six different categories of resources (love, status, information, money, goods, and services) that are usually classified by researchers in two groups: economic and socio-emotional outcomes. It is possible to find a correlation between the degree of particularism (versus universalism) and of concreteness (versus symbolism) of the benefits exchanged and the exchange process characteristic (such as the expected rewarding time). While economic
exchange relationships are usually agreements characterised by a definite and short period of time and a formalised exchange of economic resources, social exchange relationships are durable interactions that last over time and as such, comprise socio-emotional resources.

According to McClintock and Liebrand (1988), within workplace social exchange processes, the four social values that mainly influence employee behaviour and expectation are altruism, cooperation, individualism, and competition. Altruism has been defined as the desire to achieve others’ benefits (Organ 1988). Cooperation has been defined as the desire to achieve common benefits. Individualism has been defined as the desire to achieve personal benefits (Smith, CA, Organ & Near 1983). Competition has been defined as the desire to achieve more benefits than others (Smith, CA, Organ & Near 1983). Together, each of these processes explain (to a varying extent), the quality of the resulting relationships, and – importantly – their impact on employee outcomes.

While Molm (1994) indicates interdependence as an essential trait of social exchange, Paese and Gilin’s (2000) research focuses on the impact of a certain condition of exchange (such as disclosure of information) in relation to the exchange itself. The degree of disclosure of information within the process of exchange seems to impact on the counterparts’ attitude to be collaborative, on their disposition to share reliable information, and on their level of profit requested to accept and close the negotiation process.

Studying reciprocity within an organisation, Maurer et al. (2002) test an employee decision-making process based on reciprocity, which generates a three-dimensional “perceived beneficiary” system for employees, a supervisor and the organisation itself. Furthermore, Uhl-Bien and Maslyn (2003) argue that work relationships based on mutual reciprocity are developed on social exchange rather than economic exchange, confirmed by Dabos and Rousseau’s (2004) research, that introduces the concept of “cooperative
exchange” between employees or between employees and the organisation.

Focusing on the social exchange relationship in work settings, Cropanzano and Mitchell (2005) classified different employees-stakeholders social exchange relationships (such as direct supervisor, colleagues, working organisation, clients, suppliers) that affect behaviour. Cropanzano and Mitchell (2005) emphasised that exchange rules are expected to be able to impact on economic and socio-emotional outcomes: based on defined exchange rules, those interdependent relationships can develop into trusting, loyal, and mutual commitment. Hence, the fact that mutual and reciprocal exchange between employee, supervisor and the organisation itself happens in a continuum of time within the organisation, represents the effective framework to foster a resource “that keeps giving” (Cropanzano & Mitchell 2005), supporting order and stability within the organisation (Bernerth et al. 2007). More explicitly, employees with a high perception of satisfaction of their workplace exchange are expected to fulfil their obligations to their colleagues, supervisor, and organisation (Shaw et al. 2009). Schaefer (2009) classifies the resources exchanged by their duplicability or transferability.

Following Lin and Huang (2010), who underscore the relevance of the perception of equity in a social exchange process within an organisation and its impact on employees’ job performances, the current research intends to use the framework provided by the SET to draw a conceptual roadmap for strategically embedding effective safety behaviour among staff.

Summarising, the interdependence of a social exchange process can be (i) an implicit reciprocity, that involves the cultural expectation that people get what they deserve (Gouldner 1960) or the cultural mandate that people should behave as prescribed (Moore 1903/2004) or (ii) an explicit agreement about the value of the relationship to different parties (Cook, Emerson & Gillmore 1983). For the purpose of this study, it is important to test how
interactions among people can build a strong patient safety culture. Studying social exchange processes within healthcare organisations all over the world in general, and in Italy in particular, can provide an avenue for better understanding how to build effective working relationships and in turn, improve individual and group safety behaviours.

2.3 Positive Organisational Behaviour

Positive Organisational Behaviour’s (POB) research has been developed from a new approach to human psychology (Bakker & Schaufeli 2008). Positive psychology tries “to begin to catalyse a change in the focus of psychology from pre-occupation only with repairing the worst things in life to also building positive qualities” (Seligman & Csikszentmihalyi 2000, p. 5). Luthans et al. (2007) have raised the attention of the relevance of a positive managerial attitude to human resources management within contemporaneous organisations. In particular, they propose increased resources for managers in order to improve employee outcomes.

Luthans and Avolio's (2009) POB framework was initially inspired by Auguste Comte, the positivist philosopher, who believed that “their faith in science was not as a viable livelihood, intellectual pursuit or amusing endeavour, but as the best way toward knowledge that would improve the human condition” (Bailey & Eastman 1994, p. 515). As examined by Eid et al. (2012), POB may positively affect safety outcomes in high-risk industries, such as healthcare organisations, and so it has been included in the model.

In recent years, scholars involved in positive organisational studies posed the conceptual framework of the so-called positive organisational scholarship (POS) research field (Cameron, Dutton & Quinn 2003). POS is defined as:

… the study of that which is positive, flourishing, and life-giving in organisations. Positive refers to the elevating processes and outcomes in organisations.
Organisational refers to the interpersonal and structural dynamics activated in and through organisations, specifically taking into account the context in which positive phenomena occur. Scholarship refers to the scientific, theoretically derived, and rigorous investigation of that which is positive in organisational settings (Cameron & Caza 2004, p. 731).

POB focuses on employees’ psychological conditions and mindset affecting their performance within the organisation (Luthans 2002), while POS focuses on organisational conditions affecting whether the employee flourishes (Cameron & Caza 2004). The new research discipline “categorizes previous research and provides an organising frame for current and future research on positive states, outcomes, and generative mechanisms” (Roberts, LM 2006, pp. 292-3). Luthans and Avolio (2009) have stated that although positive workplace concepts are old, the settings in which they are embedded are radically changed from the past. So the positive constructs in POB, following this improvement, need to be examined.

POB framework, starting from Fredrickson (2001), enhances the positivity within Organisational Behaviour previous research (Luthans & Avolio 2009). The key assumptions expected of all constructs within POB framework are that they must be based on theory, research, and valid measurement, open to development, and have performance impact. In particular, POB focuses on those variables that can be taught within organisations, hence, even those employees with low levels can be upskilled, with resultant improvement in outcomes (Luthans & Avolio 2009).

Recently, POB researchers have indicated that positive organisational experiences can affect organisational outcomes more than the negative ones (Bakker & Schaufeli 2008). Ramlall (2008) shows an empirically tested relationship between positive employee characteristics and performance using POB framework. Moreover, POB influences safety perceptions among High-Reliability Organisations’ employees (Eid et al. 2012; Hystad,
2.4 Cooper’s framework of safety culture

In 1993, the Advisory Committee on the Safety of Nuclear Installations (ACSNI) defined the safety culture of an organisation as:

the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety management (ACSNI 1993, p. 23).

Following on from this is the definition provided by Choudhry, Fang and Mohamed (2007a, p. 211), who, starting from the ACSNI work, defined safety culture as:

… the product of individual and group behaviors, attitudes, norms and values, perceptions, and thoughts that determine the commitment to, and style and proficiency of, an organization’s system and how its personnel act and react in terms of the company’s on-going safety performance in construction site environments.

Further, numerous debates and ambiguities exist in examining the impact of workplace relationships on safety culture. Also, Choudhry, Fang and Mohamed (2007b, p. 994) argue that “unresolved debate persists as to whether an organisation has or is a culture”. Research about organisational culture suggests that the way forward is to identify the level of safety that can be achieved in a specific environment, and at the same time to build an organisational system that can let people work at that level of safety (e.g. Cole, Stevens-Adams & Wenner 2013; Guldenmund 2000; Hale et al. 2010). In fact, it is only possible to talk about reduction of safety accidents because it is misleading to think that a system involving humans could be infallible (e.g. Rasmussen 1997; Reason 2000; Reason, Carthey & de Leval 2001). Safety culture is important for the latter aspect with several studies showing the relationship between employee safety practices and culture within organisations (e.g. Avallone & Farnese 2005; Bodega 1996; Schein 1992).

To measure and analyse safety culture, Cooper (2000, 2002) has developed a
reciprocal theoretical and practical framework of safety culture based on Social Cognitive Theory (Bandura 1986) (see Figure 2-1). Cooper (2000, p. 131) discusses “the creation of a safety culture as a super-ordinate goal, which is achieved by developing and pursuing multiple sub goals” such as enhancing employees’ safety commitment. The model developed by Cooper (2000, 2002) comprises:

(i)  *Subjective internal psychological factors*, including beliefs, values, attitudes, and perceptions that can be measured at individual level and then aggregated at group or organisational level using safety climate surveys, such as Zohar's (1980) safety climate questionnaire;

(ii) *Observable on-going safety-related behaviours*, that can be assessed using peer observations, self-report measures and/or outcome measures (Cooper et al. 1994; Komaki, Barwick & Scott 1978; Sulzer-Azaro 1987);

(iii) *Objective situational features*, related to the working environment (Peponis 1985), and connected to organisations policies, operating procedures, management systems, control systems, communication flows, and workflow systems (Thompson & Luthans 1990), that can be measured using safety management system audits/inspections.

The Cooper (2000, 2002) model of safety culture includes three dimensions: situational (seizing the organisational safety structure), psychological (seizing staff perceptions about safety), and behavioural (seizing staff safety behaviours). Cooper (2000, 2002) stated that these three dimensions offered the possibility to assess and compare safety culture within different organisations and contexts.

The advantage of his model of safety culture is that, while it is strongly embedded in the theory, it offers a clear and concrete managerial model to relate to organisational safety culture. Cooper’s model has never been operationalised to be used to assess the safety culture
within a healthcare organisation.

Figure 2-1 – Reciprocal model of safety culture (Cooper 2002, p. 34)

Starting from the model of Cooper (2000, 2002), Human-Engineering (2005, p. 4) proposed the three aspect approach to safety culture presented in Figure 2-2.

Figure 2-2 – Three aspect approach to safety culture developed by Human-Engineering (2005, p. 4) based on Cooper (2000, 2002)
This research project intends to fill this gap, operationalising Cooper’s model of safety culture for acute care hospitals, using Italian data, as part of a comprehensive model of safety culture, starting with Zohar’s (2010) assumptions about somewhat conflicting managerial priorities and professional cultures. In broad terms, Zohar (2010) argues that the solution is for active management involvement in determining safety priorities and subsequent managerial procedures and actions, whilst still being open to understanding that employees are individuals with their own values, fragilities, and limits.

To conceptualise the situational dimension of safety culture (comprehending the policies, procedures, management directions that the organisation puts in place to achieve safety outcomes), a leading assumption was that

management assessments of patient safety policies and practices in their organisations … [were] … represented by formal policies and standard operating practices… provid[ing] the leadership in healthcare organisations with information about the status of official organisational practices (Nieva & Sorra 2003, p. 9).

Katz-Navon et al. (2005) also debated that the situational dimension has to seize staff feelings on guidelines and procedures that the organisations implement to increase the safety of specific processes and of the entire patient journey. Meyer, JP, Allen and Smith (1993) assessed organisational safety target and safety priorities through the analysis of the investment in employees’ safety training. Moreover, DeJoy et al. (2004) underlined that the three main factors usually studied in relation to accident rates were a) safety activities of management and safety personnel, b) anticipation of hazards and c) safety training, and they found that the better they were, the lower was their accident rate. This means that employee attitudes and behaviours result from top management policies, procedures and funding for safety training (see DeJoy et al., 2004; Zohar, 2010). The results of previous research endorse the ability of safety procedures and safety training to be expressions of the top management commitment to safety and, consequently, those factors have been used to assess the
situational dimension of safety culture. It is relevant to note that the psychological and the behavioural dimensions of safety culture are developed on the platform offered by the situational dimension.

*To conceptualise the psychological dimension of safety* (comprehending staff attitudes and perceptions about the value of the safety goals, standards, policies and procedures), the fundamental factor acknowledged has been the managerial priority of safety (Katz-Navon, Naveh & Stern 2005). It captures staff feeling about the relevance and priority that safety has for their direct supervisor, because, as posed by Choudhry, Fang and Mohamed (2007b, p. 1000), “while safety culture is about good safety attitudes, it is also about good safety management established by organisations”. The psychological dimension of safety culture is expected to predict the behavioural dimension of safety culture, according to results of previous studies which confirm that management priorities significantly impact the safety behaviour of employees (see Choudhry et al., 2007; Katz-Navon et al., 2005), although this needs to be tested in healthcare settings in Italy.

*To conceptualise the behavioural dimension of safety culture* (comprehending activities and behaviours connected to safety), the main factors that have been included are safety compliance behaviour (Neal & Griffin 2006) and an in-role safety performance (Brunetto et al. 2016; Williams & Anderson 1991). Safety compliance behaviour assesses the employees’ compliance to the organisations’ safety working procedures, while in-role safety performance assesses employees’ tasks and behaviours related to their specific role within the organisation. The behavioural dimension of safety culture is expected to be influenced by the situational and psychological dimensions because, according to Neal and Griffin (2006), employees’ safety behaviours are related to their feelings about the organisations’ expectations and rewarding system of safety practices. Hence this is an important variable to be included in the model.
Together, the three aspects of safety culture capture many of the important activities impacting patient safety. The missing ingredient from past models, including those of Cooper, is that they are not able to capture the intangible aspects of human beings, which influence perceived action and knowledge about safety. In such conceptualisation, this part is provided by examining the impact of the interaction of SET and POB factors, on Cooper’s (2000) safety culture dimensions. The model proposed for this thesis is that SET and POB variables are the predictors of safety culture. The advantage of using the three theoretical frameworks is that it addresses many of the shortcomings identified in the previous models by capturing the impact of workplace variables, as well as individual psychological attitudes and behaviours that influence whether risky or safe behaviour takes place.

2.5 Summary

The second chapter presented the three theoretical frameworks that have been used and the concepts that have been analysed in the thesis – Blau’s Social Exchange Theory (SET), Positive Organisational Behaviour (POB), and Cooper’s framework of safety culture – to operationalise a new comprehensive model of accreditation and safety culture, and to test whether SET factors (supervisor-employee relationships and engagement) and POB predict accreditation and safety culture in a causal chain, within healthcare organisations.
3. Literature review

3.1 Introduction

This chapter presents the review of the literature of the variables that the research intends to investigate, using the lens of the three frameworks adopted – Blau’s (1964) Social Exchange Theory (SET), Positive Organisational Behaviour (POB) (Luthans, Youssef & Avolio 2007), and Cooper’s (2000) framework of safety culture. The research intends to examine the perception of the quality of Leader-Member Exchange (LMX), the perception of the quality of the new variable LMX safety-related (Safety LMX), and the perception of the quality of staff psychological capital (PsyCap) within healthcare organisational relationships, and their impacts on employees’ perceptions of the quality of their engagement, and, in turn, on the quality of the psychological, behavioural and situational aspects of accreditation and safety culture. So, the chapter presents the analysis of the variables LMX, Safety LMX, PsyCap, and engagement, and then discusses safety and accreditation culture.

3.2 Leader-Member Exchange

One way of examining the supervisor-subordinate relationship is via a Leader-Member Exchange (LMX) lens. LMX is a typical SET variable because it explains the benefits of workplace relationships. The LMX theory focuses on the two-way relationship between supervisors and subordinates, and on increasing organisational success by creating positive relations between the leader and subordinates. LMX theorises that supervisors treat different employees differently. In particular, leaders usually have special relationships with an inner circle of employees, who often get high levels of responsibility, extra knowledge and access to resources (Settoon, Bennett & Liden 1996). As a result, some employees experience a high-quality of ‘social exchange’ between supervisors and themselves, which leads to a high-quality LMX relationship. This group is often called the “in-group”, and these
employees experience a high-quality of ‘social exchange’ between supervisors and
themselves, which grows into trusting relationships and, over time, leads to high-quality
LMX relationships. In return, they work harder, are more committed to task objectives, share
more administrative duties and are committed and loyal to their leader.

Within such an environment, LMX theory posits that there is a mutually beneficial
exchange of support, information, trust, participation in decision-making and respect between
supervisors and the employees in the in-group (Mueller & Lee 2002), and this is likely to
increase trust (e.g. among nurses Chen, CV et al. 2008), and to promote teamwork and role
clarity (Brunetto, Farr-Wharton & Shacklock 2011a), engagement and wellbeing (Brunetto,
Farr-Wharton & Shacklock 2012; Brunetto, Teo, et al. 2012), and empowerment (Brunetto,
Shacklock, et al. 2012) among employees. The job satisfaction of in-group members is high
and they perform effectively in their jobs; conversely, subordinates in the “out-group” are
given low levels of choice or influence and put constraints on the support given to the leader.
Due to the favouritism that the in-group members receive from their leaders, they are found
to perform their jobs better and develop positive attitude towards their jobs in comparison to
the members of the out-group (Brunetto, Farr-Wharton & Shacklock 2011b).

Recently, research studies have examined the influence of LMX on safety-related
employees’ behaviour. Hofmann and Morgeson’s (1999) research (within a manufacturing
facility that produces commercial heating and air conditioning systems in the USA) suggests
that LMX is significantly related to safety communication, safety commitment, and accidents.
Hofmann, Morgeson and Gerras’s (2003) research (within a military unit charged with
transporting heavy equipment, including combat equipment, in the USA) has found a
mediating role of safety climate between LMX and the safety citizenship role definition.

Michael et al.’s (2005) research results (within wood manufacturing in the USA)
indicate that management commitment to safety is positively related to job satisfaction, organisational commitment, and job-related performance, and that there is a negative relationship between commitment to safety and employee withdrawal behaviours. Later Michael et al. (2006, p. 469) research studies (within wood products manufacturing facilities in Pennsylvania) identified that:

the influence of LMX is greater than that of safety communication in predicting safety-related events. Neither LMX nor safety communication was significantly related to OSHA recordables [Occupational Safety and Health Administration database of safety-related events]. Results also demonstrated that employee job satisfaction and demographic variables such as gender and age have safety implications.

The research results of Mearns and Reader (2008) (within offshore oil and gas installations in the North Sea) indicate that high perceptions of employees of LMX are positively and significantly related to high perceptions of employees’ Safety Citizenship Behaviour. Effective organisational social exchanges can lead to further outcomes related to employee safety behaviours that overcome the standard compliance. Moreover, supervisor support on safety issues seems to positively affect safety performance behaviours, such as assisting colleagues and reporting adverse events (Mearns & Reader 2008).

Tucker et al.’s (2008, p. 319) research studies (within a large unionised urban transport company in England) have found that “perceived co-worker support for safety fully mediates the relationship between perceived organisational support for safety and employee safety voice”. Didla, Mearns and Flin (2009, p. 475), in their research (within UK-based oil and gas production company), state that “a positive safety culture was an influential factor in encouraging people to participate in SCBs [Safety Citizenship Behaviour], in addition to the innate human need for self-preservation”.

Kath, Marks and Ranney’s (2010, p. 643) research results (within mechanical employees of the Canadian Pacific Railway) indicate that
when all factors were considered simultaneously using dominance analysis [a method that assesses the predictive power of each variable as compared to all potential nested models of predictors (Azen & Budescu 2003; Budescu & Azen 2004)], the dominant factor predicting upward safety communication was perceived management attitudes toward safety, followed by job demands interfering with safety and then leader-member exchange.

DeJoy et al.’s (2010) research studies (within a large national retailer in the USA) have found that (i) Occupational Safety and Health Policies and Programmes affect safety climate and organisational commitment, with a mediator role of perceived organisational support; (ii) safety climate impacts on perceived safety at work and self-reported adverse events, although does not affect organisational commitment outcomes (i.e., employee withdrawal or vitality); and (iii) organisational commitment impacts on withdrawal behaviours (i.e. turnover intention, absenteeism and tardiness), employee vitality and perceived safety at work, although does not affect work accidents.

Hence numerous research outcomes have identified the important role of workplace relationships on safety outcomes in many industries, except healthcare. Therefore, there has been extensive research examining the impact of LMX on safety issues, but not in healthcare settings, where several studies have examined the link between some workplace relationships and outcomes, but few have examined safety outcomes (see Figure 3-1).

<table>
<thead>
<tr>
<th>Reference</th>
<th>Industry</th>
<th>Country</th>
<th>Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hofmann and Morgeson, 1999</td>
<td>Manufacturing facility heating and air conditioning</td>
<td>the USA</td>
<td>Safety communication, Safety commitment, Accidents</td>
</tr>
<tr>
<td>Hofmann et al., 2003; Tucker et al., 2008; Kath et al., 2010</td>
<td>Transportation Industry</td>
<td>the USA, England and Canada</td>
<td>Safety climate, Safety citizenship, Safety communication</td>
</tr>
<tr>
<td>Michael et al., 2005, Michael et al. 2006</td>
<td>Wood manufacturing</td>
<td>the USA</td>
<td>Safety commitment, Safety job performances, Accidents</td>
</tr>
<tr>
<td>Mearns and Reader, 2008; Didla et al., 2009</td>
<td>Offshore oil and gas installations</td>
<td>North Sea and UK</td>
<td>SCB, Safety performance outcomes (assist colleagues, reporting)</td>
</tr>
<tr>
<td>DeJoy et al., 2010</td>
<td>Retail Industry</td>
<td>the USA</td>
<td>Perceived organisational support, Safety commitment, Safety climate</td>
</tr>
</tbody>
</table>

Figure 3-1 – Past research linking SET with safety issues in various industries
3.3 Leader-Member Exchange safety-related

Among scholarly research, which has studied safety within the organisation, the management ability to influence safety employees’ behaviours has often been correlated with leadership commitment to safety and with leadership aptitude to effectively communicate the organisational priorities about safety to the staff. The quality of LMX enhances knowledge-sharing and participation in decision-making within teams (Birdi et al. 2008), and decreases role ambiguity associated with reduced levels of adverse events and near misses (Dawson, West & Yan 2008). A high level of satisfaction with the quality of LMX relationship and teamwork enhances employees’ role clarity, that in turn, positively influences the organisation’s performance (Brunetto, Farr-Wharton & Shacklock 2011a; Johlke & Duhan 2000). Moreover, leader-member relationships influence staff priorities and affect staff compliance with the implementation of new organisational practices (Bouckenooghe 2010).

Based on those considerations, a new concept of LMX safety-related (Safety LMX) has been developed and tested (Trincherò, Farr-Wharton & Brunetto 2017). It focuses on the leader’s support and sustenance to employees with the ultimate goal to reach the organisation safety target through communication (Hofmann & Morgeson 1999) and managerial safety practices (Katz-Navon, Naveh & Stern 2005).

3.3.1 Safety communication

Supervisors and subordinates need to communicate effectively to complete tasks. The more the communication is systematic and straightforward, the more likely the communication is effective and this is a significant factor affecting safety performance (Vredenburgh 2002). A positive supervisor-subordinate communication environment enhances the problem-solving ability of employees, which improves their attitude and promotes long-term reciprocal behaviour and constructive relationships that increase their
safety mindsets via effective safety communication and behaviour (Fairhurst 1993; Fairhurst & Chandler 1989; Fairhurst, Rogers & Sarr 1987; Hofmann, Morgeson & Gerras 2003). Supervisor-subordinate feedback practice is critical to enhancing safety practices among employees, which behaviour affects safety outcomes (Vredenburgh 2002). Moreover, supervisor-subordinate safety communication increases employees’ knowledge of safety matters like safety procedures and guidelines, consequences of insecure conduct, safety equipment usage, and emergency practices (Michael et al. 2006). Hofmann and Stetzer (1998) and Hofmann and Morgeson (1999) indicate that high levels of employee-supervisor communication increase employee’s willingness to be more open to “speak up” their safety concerns. Laurence (2005) observes the relevance of safety communication and policies in a mining setting, and Mullen (2005) tried to find “speak up” predictors.

On the contrary, low level of satisfaction with communication is a main cause of behaviours that produce high levels of employees’ role ambiguity (Johlke & Duhan 2000; Rhoads, Singh & Goodell 1994), modest safety performance rate (Hofmann & Morgeson 1999), and low efficiency and morale (Alexander, Helms & Wilkins 1989). Hence, effective communication is the tool to achieve clarity, efficiency and high safety performance.

### 3.3.2 Managerial safety practice

Previous research indicates that organisational commitment is affected by the perception of the supervisor-subordinate relationship that employees have (Brunetto, Farr-Wharton & Shacklock 2012; Brunetto, Teo, et al. 2012; Rodwell et al. 2009). Michael et al.’s (2006) research on blue-collar production workers, following previous research on white-collar or service industry employees, concludes that lower level supervisors can complement the role of a firm’s upper management (e.g., commitment to safety) in influencing safety performance. Top management teams at manufacturers should therefore strongly consider how to integrate supervisors into
the firm’s overall safety program (Michael et al. 2006, p. 475).

Further, Hofmann and Morgeson (1999) argue that LMX fosters safety commitment. A positive relationship between management commitment to safety and (i) job satisfaction; (ii) organisational commitment; (iii) job-related performance, is emphasised by Michael et al. (2005). Conversely, the relationship between commitment to safety and employee withdrawal intention is negative (Michael et al. 2005). Research elaborated by DeJoy et al. (2010) has drawn the following conclusions: (i) HRM organisational policies impact on safety climate and organisational commitment, being a mediator of perceived organisational support; (ii) although not having an impact on the outcome of organisational commitment (i.e. employee withdrawal or vitality), safety climate affects safety levels and adverse events’ self-reporting; and (iii) withdrawal behaviours, employee vitality, and safety levels, are influenced by organisational commitment (i.e. turnover intention; absenteeism, and lateness).

### 3.4 Engagement

Engagement among employees is welcomed by organisations because it enhances their passion for the job and increases their ability to work harder to meet goals (Macey et al. 2009; May, Gilson & Harter 2004; Slåtten & Mehmetoglu 2011). In the SET framework, employees’ engagement has been considered a variable dependent on workplace relationships (Brunetto et al. 2014; May, Gilson & Harter 2004). It is the supervisors’ concern to be able to influence, direct, and guide employees in order to let them behave accordingly within the organisations’ strategies, policies, guidelines and operational standard. That is why LMX has been found to be able to strongly predict employees’ engagement (Brunetto et al. 2014). Among psychologist scholars, engagement has been analysed at the other end of the spectrum of burnout. The presence of a safe environment that supports employees’ training, development and autonomy, increases their engagement, while highly taxing positions—physically, mentally, and emotionally exhausting – increase their burnout (Nahrgang,
Moreover, employees’ burnout is a predictor of unsafe behaviour and adverse events, while engagement enhances employees’ safety compliance and their involvement in safety activities, increasing the organisations’ safety performance (Vinodkumar & Bhasi 2010).

Therefore, LMX’s perceptions of Italian healthcare employees are expected to be found to be significantly and positively related to their engagement, providing new information about healthcare sector employees. Hence, the following hypothesis is posed:

*Hypothesis 1: High LMX is associated with high engagement for healthcare professionals.*

### 3.5 Individual psychological characteristics affecting safety culture

As stated in the second chapter, Positive Organisational Behaviour (POB) is “the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement” (Luthans 2002, p. 59). Starting from this definition, Luthans, Youssef and Avolio (2007) have selected four psychological characteristics suitable to be included in this framework: hope, optimism, resilience and self-efficacy.

As Luthans, Youssef and Avolio (2007) and Eid et al. (2012) resolved, hope indicates the willingness and engagement to achieve defined targets; optimism explains the individual’s anticipation of a positive consequence from one’s own actions; resilience is the aptitude to counteract major problems; and lastly, self-efficacy states the individual’s confidence and has been shown to predict performance (Bean & Eaton 2002). Together, they represent the so-called “psychological capital” (PsyCap), a human’s positive psychological state of development that persons can count on to reach their goals (Eid et al. 2012; Luthans,
Psycap should be assessed in HROs because it positively affects safety focused behaviours, promoting greater safety awareness (Eid et al. 2012). Eid et al.’s (2012) research tested the usefulness of psychological characteristics of the PsyCap construct for high-risk organisations. Following the statements of Eid et al. (2012), it seems likely that “hope” is important for the staff to implement innovative technical strategies to increase the level of safety within the processes because unless they believe this goal, they can’t really be expected to implement it. “Optimism” is relevant for the staff to believe in their ability to affect the process and the outcome, according to the organisation’s safety goal, avoiding determinism and fatalism. “Resilience” is central for the staff to challenge adverse situations and to succeed in high-risk environments. “Self-efficacy” is fundamental for the staff to feel confident to possess the right competencies to recognise potential areas of clinical risks, and the required professionalism and self-confidence to report adverse events and near misses.

Hence Eid et al. (2012) believed that the PsyCap’s construct is useful to the leader to use in influencing employees’ safety behaviour in organisations seeking safe processes. This is in line with previous Avey et al. (2010; 2008) research that found a positive relationship between individuals’ PsyCap, work attitudes and behaviours, and performance indicators. Therefore, it is likely that PsyCap has a role to play in understanding and improving safety culture.

Also, Brunetto et al.’s (2016) research results confirm the key role of PsyCap in enhancing professionals’ compliance with safety standards, behaviours and tasks decided on by their organisation within the healthcare sector, and in enhancing the value of the organisation’s investment in safety training. In a study of nurses’ safety behaviours in Australian hospitals, PsyCap, together with satisfaction with safety training and managerial
support for safety priorities, has been found to be able to predict approximately a third of nurses’ in-role safety performance (Brunetto et al. 2016). For those reasons, the variable psychological capital (PsyCap) is expected to be correlated with Safety LMX. Hence, the following hypothesis is posed:

*Hypothesis 2: High PsyCap is associated with high Safety LMX for healthcare professionals.*

### 3.6 Safety culture

Although the relevance of safety culture for high-risk organisations is clearly established, the debate about the definition of the concept is yet to be resolved among scholars (Choudhry, Fang & Mohamed 2007b; Guldenmund 2000; Haukelid 2008). Moreover, Choudhry et al. (2007b, p. 994) argue that “unresolved debate persists as to whether an organisation has or is a culture”. To better understand the safety culture concept, it is relevant to briefly outline the review of the main studies on organisational culture and climate, because, as Sawacha et al. (1999) point out, organisational characteristics affect site operations.

#### 3.6.1 Organisational climate and culture

Organisational culture and climate have been studied in the 1970s and 1980s (Guldenmund 2000) by social, personnel and organisational psychologists, sociologists, anthropologists and political scholars. Literature reviews on this topic have been published during the last 40 years (e.g. Choudhry, Fang & Mohamed 2007b; Glick 1985; Guldenmund 2000; James, L.R. & Jones 1974; Kuenzi & Schminke 2009; Schein 1992; Schneider 1975; Van Hoewijk 1988). There are several definitions of organisational culture and climate, partly based on the aim of each study, partly on the different methodologies used to measure them (e.g. Bodega 1996; Choudhry, Fang & Mohamed 2007b; Guldenmund 2000; Schein 1995).
On this topic, Denison (1996) argues that, while in the past, organisational climate studies have been characterised by the use of quantitative research methods and organisational culture studies by the use of qualitative research methods, nowadays this distinction is not so clear. In fact, among scholars, the use of quantitative research methods to analyse organisational culture is growing (Denison 1996). Denison (1996, p. 624) states that:

[c]ulture refers to the deep structure of organisations, which is rooted in the values, beliefs, and assumptions held by organisational members. […] Climate, in contrast, portrays organisational environments as being rooted in the organisation’s value system, but tends to present these social environments in relatively static terms, describing them in terms of a fixed (and broadly applicable) set of dimensions. Thus, climate is often considered as relatively temporary, subject to direct control, and largely limited to those aspects of the social environment that are consciously perceived by organisational members.

In the 1970s, as Guldenmund (2000) points out in his review of the climate and culture literature, scholars referred to this research area as “organisational climate”, while in the 1980s they addressed the concept as “organisational culture” (cf. Table 3-1 for a brief summary of the evolution of those concepts). Guldenmund (2000, p. 221) concludes, that

[t]he term organisational climate was coined to refer to a global, integrating concept underlying most organisational events and processes. Nowadays, this concept is referred to by the term organisational culture whereas the term organisational climate has come to mean more and more the overt manifestation of culture within an organisation. Therefore, climate follows naturally from culture or, put another way, organisational culture expresses itself through organisational climate.

Table 3-1 – Brief summary of organisational climate and culture definition evolution

<table>
<thead>
<tr>
<th>Reference</th>
<th>Definition of organisational climate and culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones and James (1979, p. 205)</td>
<td>Organisational climate is “a set of perceptually based, [descriptive] psychological attributes”. This concept, following Schneider’s (1975) distinction, is different (but interrelated) from affective attributes, such as job-related satisfaction.</td>
</tr>
<tr>
<td>Ekvall (1983)</td>
<td>Organisational climate is the result of shared behaviour and opinions by organisation components. With organisational culture (shared beliefs and values), social structure (informal organisation), and work relations (supervisor-subordinate relationship), it composes the organisational system.</td>
</tr>
<tr>
<td>Uttal (1983, p. 68)</td>
<td>Organisational culture is “shared values (what is important) and beliefs (how things work) that interact with a company’s people, organisational structures and control systems to produce behavioral norms (the way we do things around here)”.</td>
</tr>
<tr>
<td>Author(s)</td>
<td>Quote</td>
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<tr>
<td>Glick (1985, p. 612)</td>
<td>“The minor substantive differences between culture and climate may prove to be more apparent than real”, as based on the applied methodology: while organisational climate research has grown from a social psychological perspective and has been studied with a quantitative approach, organisational culture is embedded in anthropology and has been studied with a qualitative approach.</td>
</tr>
<tr>
<td>De Cock, Bouwen and de Witte (1986)</td>
<td>Organisational climate is the awareness of the consistency of the processes characterising an organisation, while organisational culture is the fundamental and latent significance and value attributed to the coherence of such processes.</td>
</tr>
<tr>
<td>Hofstede, GR (1986)</td>
<td>Organisational climate is a lower and middle management issue related to job satisfaction, while organisational culture is a top management issue.</td>
</tr>
<tr>
<td>Van Hoewijk (1988, p. 9)</td>
<td>Organisational climate embraces “several correlating views, habits and the atmosphere”, while organisational culture is still undefined.</td>
</tr>
<tr>
<td>Schein (1992, p. xi)</td>
<td>“The concept [of organisational culture] is hard to define, hard to analyze and measure, and hard to manage”.</td>
</tr>
<tr>
<td>Schein (1992, p. 8)</td>
<td>Organisational culture is a complex concept and is related to “observed behavioral regularities when people interact (language, customs and traditions, rituals), group norms, espoused values, formal philosophy, rules of the game, climate, embedded skills, habits of thinking/mental models/linguistic paradigms, shared meanings and ‘root’ metaphors or integrating symbols”.</td>
</tr>
<tr>
<td>Schein (1992, p. 9)</td>
<td>Organisational culture is “a pattern of basic assumptions – invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration; that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”.</td>
</tr>
<tr>
<td>Schein (1992, p. 230)</td>
<td>Organisational “climate will be a reflection and manifestation of cultural assumptions”.</td>
</tr>
</tbody>
</table>

According to Guldenmund (2000), it is possible to define the following features of organisational culture, most of which are relevant also to organisational climate: (i) it is a holistic construction (Berends 1996; Guion 1973; James, L. R. 1982): this means that culture is an abstract concept rather than a tangible phenomenon; (ii) it is relatively stable: De Cock, Bouwen and de Witte (1986) have argued that organisational culture must have been stable for at least five years; (iii) it is multifaceted and multidimensional (Guion 1973; Jones & James 1979): the debate is still open on this topic; (iv) it is shared among people or groups of people (Schein 1992): culture is mutual; (v) it is made up of different aspects: this means that within the same organisation different cultures or climates can coexist; (vi) it constitutes practices (Hofstede, GR 1991); and (vii) it is functional (Schneider 1975), because it provides a reference frame for behaviour. To sum up, organisational culture is a reasonably stable, multifaceted, holistic vision (belief system), socialised within the organisation providing the framework that can explain or can be explained by observed behaviours (Choudhry, Fang &
As previously said, the concept of organisational culture has been differently defined, and measured (e.g. Jung et al. 2009; Martins & Treblanche 2003), and there is still no agreement among scholars on definition, dimensions, and measures to be used to address it (e.g. Alavi, Kayworth & Leidner 2006). The definition of organisational culture adopted in this study is Schein’s (1992, p. 9), who defines organisational culture as a pattern of shared basic assumptions that a group has learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems.

Schein (1985) considers organisational culture to be the result of the union of three levels of culture – artefacts, values, and basic assumptions (principles), discussed as follows:

- **Artefacts**: the set of everything that is visible in the organisation such as behaviours, procedures, processes, physical spaces, objects; it is made up of all the creations and artefacts that are part of the culture (Schein 1985). It can include the histories and rituals because the artefacts make up the majority of the symbolic universe of an organisation (Schein 1985). Artefacts are not so difficult to identify, they are in fact rather evident; however, it could be difficult to understand their meaning, the way in which they are linked, what models they reflect (Schein 1985). Artefacts can be defined as (Schein 1985): (i) organisational structure, meaning organisational chart and relations; (ii) procedures, meaning formalised processes; (iii) production technologies and support, meaning equipment and systems; (iv) information systems, meaning information flow and the key relationships within the networks.

- **Values**: the set of all the guidelines that the organisation uses to define operational behaviours (Schein 1985). Every cultural message mirrors the individual values of a single person, and every time a group faces a new challenge, the first solution found
can only be defined as a value, because there is not yet a common ground to decide how to face reality. If the first solution found is successful, the value slowly begins its transformation process to become a belief and in the end a principle. When a set of values is taken for granted they become part of that set of ideas to which people unconsciously refer. Not every value is, however, transformed to a principle; only the values that can receive social approval and that are effective in problem solving are transformed. Accordingly, values (Avallone & Farnese 2005) can be defined as: (i) quality assurance; (ii) innovation assurance; (iii) acceptance of difficult and specific goals; (iv) teamwork; (v) acceptance of personal responsibility for specific actions; (vi) sharing of operational values.

- Basic Assumptions: the set of ideas within the unconscious that explains the way people interpret reality and, based on these ideas, employees find possible areas of intervention in the world (Schein 1985). They form the basis of actions, but rarely are discussed, because – especially if they are socially regarded as being important – it would be impossible for a certain group to act differently from those principles, and those principles cannot be compared or discussed (Schein 1985). Instead, the principles (ideas) are visible in behaviours, especially in relation to: (i) relationships between organisation and environment; (ii) concepts of reality and truth that can be analysed as existence of an objective reality (facts that have a unique interpretation) or as reality as interpretation (facts that are constructed during the interpretation process); (iii) beliefs in human nature; (iv) value and meaning of work, such as the relevance of individual contribution to a job or the relevance of having a job for a human being; (v) cohabitation styles and personal relationships, such as cooperation or competition, individualism or integration, appreciation of norms, competencies, consensus, authority (Schein 1985).
To summarise: basic assumptions are taken for granted so they cannot be consciously recognised – they are considered the true essence of culture – while the other two levels are thought to derive from them (Schein 1985) (see Figure 3-2).

Schein’s approach looks at organisations in an integrated way, describing, if not fully understanding, not only the visible mechanisms (artefacts), but also the possible relationships amongst them, and the systems of symbols that are present in an organisation at a cognitive level (Bruner 1996; Vygotskij 1987). If artefacts are indeed the only tangible objects known, the organisational action should be analysed, referring also to the thinking process, that is to say, elaboration abilities, building abilities and symbolic abilities that can be found in a specific organisation (Bruner 1996; Vygotskij 1987).

3.6.2 Antecedents and outcome of organisational culture

Following Hofstede’s (1980) study that analysed cultural values and their impacts on employees’ collective behaviours, Konovsky and Pugh (1994) focused their research on the (positive) relationship between effective supervisor-subordinate social exchanges and subordinates’ organisational culture. While trust is an organisational culture antecedent (Cropanzano & Mitchell 2005; Whitener et al. 1998), a supportive culture seems to be positively related to employees’ ability to gain information, benefits, and rewards (Das &
Teng 1998). Hence, a supportive organisational culture should offer organisational management a path to implement values and principles to improve (i) professionals’ organisational commitment (Lok & Crawford 2004), (ii) innovative behaviour (Lizardo 2006; Maqsood, Walker & Finegan 2007; Martins & Treblanche 2003; Williams & Anderson 1991), (iii) process efficiency and effectiveness (Denison & Mishra 1995). However, Adler and Kwon (2002) call for empirical research on this topic.

Although widely recognised as one of the most challenging tasks (e.g. Langan-Fox & Tan 1997; Roberts, KH & Rousseau 1989) for top management, it is a key function of top managers to strategically influence the organisational culture so as to guarantee its alignment with organisational goals, and increase the effectiveness of the organisation itself (Martins & Treblanche 2003). Success at implementing cultural strategies has been positively related to producing increased clarity of policies and strategies, more effective knowledge of them among employees (Langan-Fox & Tan 1997), the efficacy of communicating those strategies across the organisation, and managerial effectiveness to implement them (Smith, ME 2003).

### 3.6.3 Safety climate and culture

According to Choudhry (2007b, p. 996), “the concept of safety culture has not developed theoretically from the organisational culture”. Actually, according to Guldenmund (2000), the first study on safety climate is by Keenan et al. (1951), and the first use of the safety culture concept is related to the nuclear explosion at Chernobyl in 1986 (Choudhry, Fang & Mohamed 2007b; Cole, Stevens-Adams & Wenner 2013; Wiegmann et al. 2002). The International Safety Advisory Group – ISAG – of the International Atomic Energy Agency – IAEA – referred, among other things, to a poor safety culture as a co-cause of the Chernobyl nuclear accident (International Nuclear Safety Advisory Group 1988). Moreover, the debate on the distinction between climate and culture is still open and a clear and unambiguous
definition is lacking, as shown in Table 3-2 (Choudhry, Fang & Mohamed 2007b; Guldenmund 2000).

**Table 3-2 – Summary of safety climate and safety culture definition evolution**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Definition of safety</th>
<th>Climate</th>
<th>Culture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zohar (1980)</td>
<td>Moral perceptions that workers share regarding their working environment</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Glennon (1982a, 1982b)</td>
<td>Employees’ perceptions of the numerous features of their organisation that have a direct impact on their behaviour to reduce or remove the danger. Safety climate is a particular type of organisational climate</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Brown and Holmes (1986)</td>
<td>A set of perceptions or beliefs of individuals or groups about a certain object</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Lutness (1987)</td>
<td>Not clearly defined</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Cox and Cox (1991)</td>
<td>It mirrors attitudes, beliefs, perceptions, values that workers share relating to safety</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Dedobbeleer and Beland (1991)</td>
<td>Moral perceptions that people have regarding their working activities</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>International Safety Advisory Group (1991)</td>
<td>It is that assembly of characteristics and attitudes in organisations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pidgeon (1991)</td>
<td>All the beliefs, norms, attitudes, roles, social behaviours and techniques that minimise exposure to risky situations for front-line workers, managers, clients and external audience (Pidgeon 1991). It happens when an organisation brings together large numbers of people and imbues them for a sufficient time with a sufficient similarity of approach, outlook, and priorities to enable them to achieve collective, sustained responses which would be impossible if a group of unorganised individuals were to face the same problem (Turner &amp; Pidgeon 1997, p. 46)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>ACSNI (1993, p. 23)</td>
<td>The product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety management</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Ostrom, Wilhelmsen and Kaplan (1993)</td>
<td>The idea that beliefs and behaviours of an organisation, when they become practices, policies, and procedures, can influence organisational performance in terms of safety</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Safety Research Unit (1993)</td>
<td>Not clearly defined</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Cooper and Philips (1994)</td>
<td>It is about sharing the perceptions and beliefs that workers have regarding safety in their working environment</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Niskanen (1994)</td>
<td>It is a set of attributes that can be perceived while carrying out everyday working activity and can be generated through specific policies</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coyle, Sleeman and Adams (1995)</td>
<td>Objective measurement of attitudes and perceptions about safety themes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berends (1996)</td>
<td>Collective mental program for safety done by organisational members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geller, Roberts and Gilmore (1996)</td>
<td>In a Total Safety Culture everyone is responsible for safety and pursues it on a daily basis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lee, TR (1996)</td>
<td>It is the result of group and individual values, of attitudes, perceptions, competencies, behavioural models that define the effort, the managing style towards safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cabrera, Isla and Vilela (1997)</td>
<td>Shared perceptions of members of an organisation regarding their working environment and, more specifically, their safety policies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Williamson et al. (1997)</td>
<td>It is a concept that describes safety ethics inside an organisation or working place, and it reflects workers’ beliefs towards safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kennedy and Kirwan (1998)</td>
<td>An abstract concept, which is underpinned by the amalgamation of individual and group perceptions, thought processes, feelings, and behaviours, which in turn gives rise to the particular way of doing things in the organisation. It is a sub-element of the overall organisational culture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooper (2000)</td>
<td>Safety cultures result from the effective interaction of organisational elements such as environmental structures and processes within the organisation, attitudes and perceptions of workers, and safety-related behaviours of individuals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glendon and Stanton (2000)</td>
<td>Comprises attitudes, behaviours, norms, values, personal responsibilities, as well as human resources, features such as training and development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guldenmund (2000)</td>
<td>Those aspects of the organisational culture which will impact on attitudes and behaviour related to increasing or decreasing risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hale (2000)</td>
<td>Refers to “the attitudes, beliefs, and perceptions shared by natural groups as defining norms and values, which determine how they act and react in relation to risks and risk control systems”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glendon and Litherland (2001)</td>
<td>Workers’ perceptions of the main characteristics of their organisation that have a direct impact on their behaviour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvey et al. (2001, p. 616)</td>
<td>Learned behaviour and those beliefs in the necessity, practicality and effectiveness of controls, attitudes and risk perception which make people think safely and trust in safety measures or characteristics and attitudes in organisations which result in safety issues being a priority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mohamed (2003)</td>
<td>A sub-facet of organisational culture, which affects workers’ attitudes and behaviour in relation to an organisation’s on-going safety performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DeJoy et al. (2004, p. 81)</td>
<td>[S]afety culture tends to focus on the deeper and less readily accessible core values and assumptions of the organisation regarding safety</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
and human resources

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fang, Chen and Louisa (2006)</td>
<td>A set of prevailing indicators, beliefs and values that the organisation owns in safety</td>
<td>X</td>
</tr>
<tr>
<td>Choudhry, Fang and Mohamed (2007a, p. 211)</td>
<td>The product of individual and group behaviours, attitudes, norms and values, perceptions, and thoughts that determine the commitment to, and style and proficiency of, an organisation’s system and how its personnel act and react in terms of the company’s on-going safety performance in construction site environments</td>
<td>X</td>
</tr>
<tr>
<td>Singer et al. (2009, p. 400)</td>
<td>The values shared among organisation members about what is important, their beliefs about how things operate in the organisation, and the interaction of these with work unit and organisational structures and systems, which together produce behavioural norms in the organisation that promote safety</td>
<td>X</td>
</tr>
<tr>
<td>Vogus, Sutcliffe and Weick (2010, p. 61)</td>
<td>Safety culture encompasses the shared values, attitudes, and behavioural norms that determine the degree to which all organisational members direct their attention and actions toward minimising patient harm during delivery of care</td>
<td>X</td>
</tr>
</tbody>
</table>

As Guldenmund (2000, p. 235) well summarises,

most researchers have defined either safety climate or safety culture in their publications as well as why they want to explore it. […] The purpose of these studies is often quite practical, although theoretical motives are also put forward. The accent on either perceptions, beliefs or attitudes as well as one or another aggregate (e.g. “molar”, “group”, “summary”) suggests a self-administered questionnaire research paradigm.

Within the safety literature, safety climate is frequently considered as a proxy measure of culture since it can be assessed effortlessly and cost-effectively through surveys methods (Glendon, Clarke & McKenna 2006; Guldenmund 2007). Building on Schein’s definition of organisational culture, DeJoy et al. (2004, p. 81) argue that “[s]afety culture tends to focus on the deeper and less readily accessible core values and assumptions of the organisation regarding safety and human resources”. Therefore this is the position taken in this thesis. Of
greater importance is the lack of valid instruments able to be used to collect empirical data about safety culture. This issue is explored below in some detail.

Using Schein’s (1992) definition of organisational culture, culture is made up also of artefacts, which include procedures, processes, technologies, which in turn affect behaviours. Therefore, assuming safety culture to be a function of organisational culture, because behaviour at work affects safety behaviour and the action taken in relation to safety, so organisational culture can be argued to determine safety culture (Guldenmund 2000). Safety culture can then be defined as the union of those aspects of the organisational culture that has an impact on attitudes and behaviours, linked to an increase or a reduction of risks connected with one’s job (Guldenmund 2000). Starting from those assumptions, Guldenmund (2000) analyses safety culture using the three levels of Schein’s (1992) organisational culture framework, which can be examined separately (see Figure 3-3).

![Figure 3-3 – Guldenmund (2000) and Schein’s (1992) safety culture conceptualisation](image-url)
The inner level is represented by the principles that lie deeply in a person’s unconscious and can be found throughout the organisation. The following level is that of values, which can become attitudes. At the end, the third level is that of artefacts, that is to say, all tangible and visible things (see Table 3-3).

**Table 3-3 – Framework to analyse organisational and safety culture (Guldenmund 2000; Schein 1992)**

<table>
<thead>
<tr>
<th>Levels of Culture</th>
<th>Visibility</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artefacts</td>
<td>Visible, but difficult to grasp the underlying culture</td>
<td>Meetings, dress code, inspection reports, personal equipment, bulletins, billboards</td>
</tr>
<tr>
<td>Values/attitudes</td>
<td>Relatively explicit and conscious</td>
<td>Attitudes, policies, training manuals, procedures, reporting systems of error, job descriptions.</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liveware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic assumptions</td>
<td>Mostly implicit, they are obvious for group members; invisible, they belong to the unconscious</td>
<td>They must be guessed from artefacts and values, as well as from observation</td>
</tr>
<tr>
<td>Nature of reality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of human beings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of human activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of human relations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The strength of Schein’s approach is in the fact that it blends together safety, climate and culture, overcoming the existing debate of those notions, so strictly linked and yet still so confused. The weakness of Schein’s approach seems to be the fact that it blends together the individual and the organisational level of safety culture, and a way of overcoming this weakness is to use the Cooper’s (2000) framework of analysis, previously discussed.

### 3.6.4 Antecedents and outcome of safety culture

At the turn of the century, Guldenmund states (2000, p. 238) that

> [t]he element missing in many publications on safety culture is an explicit, theoretical model outlining the manner in which safety culture is thought to be embedded in the whole of an organisation’s practices and system structure.
Moreover, he argues (2000, p. 253) that only a few studies attempted to determine “a relationship between safety performance measures and safety culture or climate assessments”.

Since then, Fernandez-Muniz, Montes-Peon, and Vazques-Ordas (2007) found that (i) managers’ commitment enhances employee involvement and safety management systems; (ii) safety management systems enhance employee involvement and safety performance; and (iii) employee involvement enhances safety. Vinodkumar and Bhasi (2010) argue that (i) safety knowledge and safety motivation mediate the impact of safety training (key safety management practice), safety communication, safety rules and procedures, safety compliance and safety participation; (ii) management commitment impacts positively on safety compliance, (iii) workers’ involvement positively impacts on safety participation, and (iv) safety promotion policies positively impact on safety participation. Nahrgang, Morgeson, and Hofmann (2011) found that: (i) job demands (risks and hazards, physical demands, and complexity) have a positive effect on burnout and a negative effect on engagement; (ii) job resources (knowledge, autonomy, supportive environment: social support, leadership, safety climate) have a negative effect on burnout and a positive effect on engagement; (iii) burnout has a positive effect on safety outcomes (accidents and injuries, adverse events, and unsafe behaviour); (iv) engagement has a negative effect on safety outcomes; (v) safety climate positively affects climate and negatively affects accidents and injuries.

More recently, some scholars have started to apply Social Exchange framework to organisational safety issues. In particular, Hofmann and Morgeson’s (1999) research results (within a manufacturing facility that produces commercial heating and air conditioning systems in the USA) suggest that POS is significantly related to safety communication and LMX to safety communication, safety commitment, and accidents. The research of Hofmann, Morgeson and Gerras (2003) (within a military unit charged with transporting heavy
equipment, including combat equipment, in the USA) tests the mediator role of safety climate between LMX and the safety citizenship role definition. Michael et al.’s (2005) research results (within wood manufacturing in the USA) indicate that management commitment to safety is positively related to job satisfaction, organisational commitment, and job-related performance, and negative relationship between commitment to safety and employee withdrawal behaviours. Michael et al.’s (2006, p. 469) research results (within wood products manufacturing facilities in Pennsylvania) suggest that

the influence of LMX is greater than that of safety communication in predicting safety-related events. Neither LMX nor safety communication was significantly related to OSHA [Occupational Safety and Health Administration] recordables. Results also demonstrated that employee job satisfaction and demographic variables such as gender and age have safety implications.

As noted in par. 3.2, the research results of Mearns and Reader (2008) (within offshore oil and gas installations in the North Sea) indicate that high perceptions of employees of LMX are positively and significantly related to high perceptions of employees’ Safety Citizenship Behaviour. Effective organisational social exchanges can lead to further outcomes related to employee safety behaviours that overcome the standard compliance. Moreover, supervisor support on safety issues seems to positively affect safety performance behaviours, such as assisting colleagues and reporting adverse events (Mearns & Reader 2008).

Tucker, S et al. (2008, p. 319) (within a large unionised urban transport company in England) found that “perceived co-worker support for safety fully mediates the relationship between perceived organisational support for safety and employee safety voice”. Didla, Mearns and Flin’s (2009, p. 475) research (within a UK-based oil and gas production company) found that “a positive safety culture was an influential factor in encouraging people to participate in SCBs, in addition to the innate human need for self-preservation”.

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Kath, Marks and Ranney’s (2010, p. 643) research results (within mechanical employees of the Canadian Pacific Railway) indicate that

when all factors were considered simultaneously using dominance analysis, the dominant factor predicting upward safety communication was perceived management attitudes toward safety, followed by job demands interfering with safety and then leader-member exchange.

As noted in par. 3.2, DeJoy et al.’s (2010) research studies (within a large national retailer in the USA) have found that (i) Occupational Safety and Health Policies and Programmes affect safety climate and organisational commitment, with a mediator role of perceived organisational support; (ii) safety climate impacts on perceived safety at work and self-reported adverse events, although does not affect organisational commitment outcomes (i.e., employee withdrawal or vitality); and (iii) organisational commitment impacts on withdrawal behaviours (i.e. turnover intention, absenteeism and tardiness), employee vitality and perceived safety at work, although does not affect work accidents.

One of the implications is that a positive safety culture requires “communication founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventative methods” (ACSNI 1993, p. 23). Starting from the evidence that the majority of organisations seem to face problems in the process to align culture with organisational goals, and the lack of empirical research about organisational culture, it is important to develop an understanding of the role that organisational culture engages, when attempting to develop an environment that fosters workplace (employee) and patient safety.

As previously reviewed, the concepts are similar to the research of Hofmann, Morgeson and Gerras (2003), that examined the case for a military unit in the USA, and Mearns and Reader (2008), that examined the case for offshore oil and gas installations in the North Sea. The missing ingredient from past models has been the analysis of the interaction
of SET factors on Cooper’s (2000) safety culture dimensions. Therefore, LMX’s perceptions of Italian healthcare employees are expected to be found significantly and positively related to the three aspects of safety culture (situational, psychological and behavioural) stated by Cooper (2000), that capture many of the important aspects impacting patient safety. Figure 3-4 represents the interactions of SET factors and Cooper’s (2000) safety culture dimensions.

Figure 3-4 – Variables’ relationships to be tested

3.6.4.1 Situational dimension of safety culture

As previously discussed, safety procedures and safety training have been identified as two of the key factors affecting safety within the working environment and connected with organisational policies and operational processes, and therefore are included within the situational dimension of safety culture.

Safety procedures

Safety procedures have been defined by Katz-Navon, Naveh and Stern (2005, p. 1076) as the “employees’ shared perceptions of the level of detail in an organisation’s safety procedures”. Katz-Navon, Naveh and Stern (2005), assessed safety procedures in healthcare organisations and proved their ability to affect safety performance. As previously noted, in the healthcare sector the staff’s compliance with the organisation’s procedures does not
guarantee by itself the patient safety, because of the specific characteristics of the processes of care. It is also to be noted that in healthcare organisations a certain flexibility has to be maintained to face the unpredictability of the conditions, and so too many and too exhaustive and rigid procedures are inefficient tools (Cropanzano & Byrne 2001). Additionally,

management assessments of patient safety policies and practices...[are]...represented by formal policies and standard operating practices...[and]...provide the leadership in healthcare organisations with information about the status of official organisational practices. (Nieva & Sorra 2003, p. 9).

Nonetheless, the inclusion in the model of this variable to assess the situational dimension of an organisation’s safety culture relies on its ability to measure “what an organisation has” in terms of effort to prevent adverse events. In fact, the variable “Safety procedures” that assess the knowledge among the staff on the presence of extensive and detailed safety procedures, is a good proxy for the effort made by an organisation to increase the governance of staff behaviour.

**Safety training**

Along with safety procedures, staff training about safety is a key managerial tool to enhance employees’ competencies and abilities to increase patient safety (DeJoy et al. 2010). The relevance of safety training within a safety culture model is well analysed by Pellicer and Molenaar (2009), which explicitly encourages Cooper to insert the variable into his model. In regard to procedures (previously analysed), training is also an effective way to communicate to the staff the organisation’s targets and priorities (Meyer, JP, Allen & Smith 1993). Within healthcare organisations, staffs’ perception of the quality of the training offered by certain organisations has been proven to be affected by the quality of the supervisor-employee relationship (Brunetto, Farr-Wharton & Shacklock 2012), and by the quality of the perceived organisational support (Trinchero, Brunetto & Borgonovi 2013).
3.6.4.2 Psychological dimension of safety culture

As previously discussed, the perception of the safety priority among staff has been identified as the key factor able to capture the psychological dimension of safety culture in an organisation. HROs’ strategy for error control is based on the high prioritisation of safety and on the stress of the managerial practices that guarantees safety (Katz-Navon, Naveh & Stern 2005, 2009; Reason 1997).

Safety priority

Safety priority assesses staff’s’ perceived expectation about the relevance of safety (Katz-Navon, Naveh & Stern 2005). In order to affect safety performance, the employee’s perception of the priority of safety for the organisation should be coherent with the employee’s perception of the priority of safety for the direct supervisor. Priority of safety influences employees’ motivation to be safety accountable and responsible (Katz-Navon, Naveh & Stern 2005, 2009; Zohar 2002). In healthcare organisations, a high safety priority increases safety performance, because of the higher amount of resources dedicated to safety and the lower role conflict experienced by doctors (Katz-Navon, Naveh & Stern 2009). When the perception of safety priority among employees is too low, the safety procedures are seen to be redundant and bureaucratic (red tape) and ignorable without effects (Falbruch & Wilpert 1999).

3.6.4.3 Behavioural dimension of safety culture

“The components of performance represent the behaviours that individuals perform at work” (Neal & Griffin 2002, p. 202). Borman and Motowidlo (1993) identified two categories of safety behaviours based on the difference between task and contextual performance: safety compliance behaviours - following safety rules and regulations, i.e. core activities to provide workplace safety (DeJoy et al. 2004) - and safety participation
behaviours - activities that support a safety environment (for example, performing a mandatory safety task, backing up colleagues in safety problems, and presence at safety meetings). As formerly mentioned, safety compliance and in-role safety performance have been identified as two of the key factors affecting staff behaviours about safety within the working environment, and therefore are included within the behavioural dimension of safety culture. SET can explain the relationship between engagement, safety priority, and safety behaviours: evidence suggests that engaged employees reciprocate positive workplace relationships by performing at their best (Tsui et al. 1997), and when the organisation values safety, they reciprocate by following the established safety procedures (Hofmann & Morgeson 1999).

**Safety compliance**

Safety compliance has been defined as “the core activities that individuals need to carry out to maintain workplace safety” (Neal & Griffin 2006, p. 947). Compliance to an organisation’s standards and use of the required personal protections are examples of safety compliance behaviours (Neal & Griffin 2006). Leader-member relationships impact on the employees’ perceptions of the relevance of the organisation’s procedures and increase their engagement to act according to those procedures and to perform safety behaviours (Neal & Griffin 2006; Zohar & Luria 2004).

**In-role safety performance**

In-role safety performance assesses the extent to which staff adopt the safety behaviours expected by the organisation (Brunetto et al. 2016; Williams & Anderson 1991). Supervisors’ commitment to safety, organisational policy, procedures, and training affect employees’ perceptions of in-role safety performance (Clarke 2013; Katz & Kahn 1978), while, management commitment to safety practice affects employees’ safety behaviour.
(Katz-Navon, Naveh & Stern 2005). Furthermore, “simultaneous occurrence of two or more role expectations such that compliance with one would make compliance with the other more difficult” (Katz & Kahn 1978, p. 204) causes role conflict, that decreases employees’ performance.

Hence, the following hypotheses are posed:

**Hypothesis 3:** High LMX is associated with high perception of the situational dimensions of safety culture for healthcare professionals.

**Hypothesis 4:** High LMX is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.

**Hypothesis 5:** High LMX is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.

Consequently, the engagement perceptions of Italian healthcare employees are expected to be significantly and positively related to their safety culture, providing new information about healthcare sector employees. Hence, the following hypotheses are posed:

**Hypothesis 6:** High engagement is associated with high perception of the situational dimensions of safety culture for healthcare professionals.

**Hypothesis 7:** High engagement is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.

**Hypothesis 8:** High engagement is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.

Moreover, the situational safety culture perceptions of Italian healthcare employees
are expected to be significantly and positively related to their safety behaviour, providing new information about healthcare sector employees. Hence, the following hypotheses are posed:

**Hypothesis 9:** High perception of the situational dimensions of safety culture is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.

**Hypothesis 10:** High perception of the situational dimensions of safety culture is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.

**Hypothesis 11:** High perception of the psychological dimensions of safety culture is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.

**Hypothesis 12:** High Safety LMX is associated with high safety culture for healthcare professionals.

Finally, as people with higher levels of psychological capital are more driven (i.e. they present higher levels of self-efficacy), and more able to push through organisational challenges, performing in a safer way (Eid et al. 2012), PsyCap is expected to predict individual’s inclinations towards safety culture. Hence, the following hypothesis is posed:

**Hypothesis 13:** High PsyCap is associated with high safety culture for healthcare professionals.

### 3.7 Accreditation culture

Pomey et al. (2005) and Pomey et al. (2010) refer to the accreditation process within
healthcare organisations as a broadly and widely recognised third-party quality assurance approach, designed to ensure a predefined level of quality and safety standards among the different healthcare settings. The belief that informs this approach is that the compliance of an organisation’s processes to achieve certain evidence-based standards should also increase the quality and the safety of that organisation’s performances and outcomes, although those relationships have not been empirically proven (Greenfield & Braithwaite 2009; Miller et al. 2005).

Based on the principles that to increase the quality and safety of an organisation’s system is also an efficient way to develop better quality and safety so as to increase organisational outcomes, most of the national healthcare systems worldwide have implemented a mandatory accreditation system with the intention of assessing and controlling the level of quality of care within the healthcare organisation across countries (so-called “institutional accreditation systems”).

There is also a large development of agencies (mainly not-for-profit institutions) that provide a voluntary accreditation process to those healthcare organisations that would like to be assessed to prove attainment of an excellent standard of processes in care delivery (so-called “excellence accreditation systems”) (Braithwaite et al. 2010; Braithwaite et al. 2006). In Italy, where the research project presented in the thesis was carried out, an institutional national accreditation system has been developed, to inform each of the 21 Italian regional accreditations systems how to assess the quality of the processes of care of both public and private healthcare organisations (Brusoni et al. 2007).

Starting from the evidence that an organisation’s accreditation system has the strength to impact the healthcare staff values, beliefs and behaviours about quality and safety (Martin 2013; Morris 2012), the idea of the hidden presence of an accreditation culture able to
influence the safety culture has arisen. Beginning with the ACSNI (1993) definition of safety culture, and using a literature deductive approach and an experience inductive approach to translate the construct, the accreditation culture has been defined as “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s compliance management system” (Trinchero, Farr-Wharton & Brunetto 2017, p. 6). For those reasons, the accreditation culture is expected to influence the safety culture of an organisation.

Moreover, because the effort that the staff is going to deliver to meet the accreditation standard is influenced by their leader’s support and by their leader’s example, with the ultimate goal to reach the organisation safety targets, Safety LMX (Trinchero, Farr-Wharton & Brunetto 2017) is expected to be impact on the staff accreditation culture. And, as staff with higher levels of psychological capital are more motivated to follow the organisation’s safety rules in spite of the day-to-day difficulties (Eid et al. 2012), PsyCap is expected to predict individuals’ inclinations to implement the type of behaviours likely to promote a positive accreditation culture.

Hence, the following hypotheses are posed:

**Hypothesis 14:** High Safety LMX is associated with high accreditation culture for healthcare professionals.

**Hypothesis 15:** High PsyCap is associated with high accreditation culture for healthcare professionals.

**Hypothesis 16:** High accreditation culture is associated with high safety culture for healthcare professionals.
3.8 Summary

The third chapter presented the review of the literature of the variables that the research intends to investigate. The chapter presented the analyses of the following variables: Leader-Member-Exchange (LMX), LMX safety-related (Safety LMX), psychological capital (PsyCap), engagement, and the psychological, behavioural and situational dimensions of accreditation and safety culture. As well, the chapter presented the hypotheses of this thesis. For a synthetic and comprehensive view of the hypotheses to be tested, see Table 3-4.

Table 3-4 – Hypotheses to be tested

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>High LMX is associated with high engagement for healthcare professionals.</td>
</tr>
<tr>
<td>H2</td>
<td>High PsyCap is associated with high Safety LMX for healthcare professionals.</td>
</tr>
<tr>
<td>H3</td>
<td>High LMX is associated with high perception of the situational dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H4</td>
<td>High LMX is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H5</td>
<td>High LMX is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H6</td>
<td>High engagement is associated with high perception of the situational dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H7</td>
<td>High engagement is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H8</td>
<td>High engagement is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H9</td>
<td>High perception of the situational dimensions of safety culture is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H10</td>
<td>High perception of the situational dimensions of safety culture is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H11</td>
<td>High perception of the psychological dimensions of safety culture is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H12</td>
<td>High Safety LMX is associated with high safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H13</td>
<td>High PsyCap is associated with high safety culture for healthcare professionals.</td>
</tr>
<tr>
<td>H14</td>
<td>High Safety LMX is associated with high accreditation culture for healthcare professionals.</td>
</tr>
<tr>
<td>H15</td>
<td>High PsyCap is associated with high accreditation culture for healthcare professionals.</td>
</tr>
<tr>
<td>H16</td>
<td>High accreditation culture is associated with high safety culture for healthcare professionals.</td>
</tr>
</tbody>
</table>
4. Methodology

4.1 Introduction

The aim of this chapter is to specify the knowledge claim (or theoretical perspective), the strategy of inquiry (or methodology), and the research methods proposed for this study following Crotty’s model (1998) to examine the safety culture of healthcare professionals. The most widely used research paradigms, strategies of inquiry, and research methods are presented and discussed to clarify and substantiate the research design that has been adopted for the present study. Information about the survey design, the identification of the research panel, the survey submission and data analysis are also provided.

4.2 Research paradigms

The research paradigm of this study is presented and discussed. A scientific paradigm (Neuman 2011, p. 94) is

a whole system of thinking [that] includes basic assumptions, the important questions to be answered or puzzles to be solved, the research techniques to be used, and examples of what good scientific research is like.

As Babbie argues (2004, p. 37), the selection of research paradigm is relevant because it “shapes the kinds of observations we are likely to make, the sorts of facts we seek to discover, and the conclusions we draw from those facts”. Thus these issues are addressed in this chapter.

4.2.1 Post-positive knowledge claim

Post-positivism is a 19th-century research paradigm (Smith, S 2000) that challenges the positivist approach about the possibility to achieve an “absolute truth of knowledge” (Creswell 2003, p. 7), by studying the behaviour of human beings. “Post-positivism reflects a deterministic philosophy in which causes probably determine effects or outcomes” and it is
reductionist, reducing “the ideas into small, discrete sets of ideas to test, such as the variables that constitute hypotheses and research questions” (Creswell 2003, p. 7). Positive

ivism assumes an objective and tangible point of view and trusts deductive rational thinking to develop universal laws, that are not affected by context, time and values (Alcoff 2010). Positive

といった propositions need to satisfy four specific requests (Lee, AS 1991): (i) falsifiability (level of details sufficient to be invalidated through empirical testing); (ii) logical consistency (formal logic of the different elements, and compatibility of the predictions); (iii) relative explanatory power in comparison to the competing theories; (iv) survivability (ability to challenge any criticism through empirical testing with quantitative data). The universal laws should be suitable to be verified with empirical data (Johnson, P & Duberley 2000). Large samples and validated formalised hypotheses allowed scholars to generalise their results in relation to other settings on the basis of statistical probability (Lincoln & Guba 2000), and predict behaviour on comparable topics in different environments with a level of confidence (Cavana, Delahaye & Sekaran 2001). Positivists assume that it is necessary to provide a reasonable description for each theoretical proposition, although it is impossible to prove any of them (Babbie 2004). Johnson, RB and Onwuegbuzie (2004) argue that positivists’ formalised and rigorous research protocols provide accurate and quantitative data, and decrease the potential effect of a researcher’s bias, offering a rapid and cost-effective method of studying large sample. Finally, Neuman (2011) argues that positivism has a dualistic nature, identifying the distinction between observable facts and ideas, values or theories about them.

4.2.2 Socially constructed knowledge claim

Interpretivism and its variants such as constructivism, phenomenology and grounded theory (Neuman 2011), challenge positivism’s adequacy to study human social interactions, recognising that individuals develop subjective meanings of their experiences (Lewis-Beck,
Interpretivists adopt multiple, subjective, socially constructed views, relying on the statements that knowledge is built on individuals’ perception, with setting, time and values related (Lewis-Beck, Bryman & Futing Liao 2004). Following Crotty (1998), constructivism’s main assumptions are that (i) “[h]uman beings construct meanings as they engage with the world they are interpreting”; (ii) “[h]umans engage with their world and make sense of it based on their historical and social perspectives; (iii) “[t]he basic generation of meaning is always social, arising in and out of interaction with a human community (Creswell 2003, p. 9). Interpretivists are focused on understanding specific contexts rather than generating universal laws (Lincoln & Guba, 2000). As Cavana (2001, p. 8) argues, interpretivist theories inductively create “a rich and complex description of how people think, react and feel under certain contextually specific situations”.

4.2.3 Pragmatic knowledge claim

Charles Sanders Peirce (1839-1914), William James (1839-1910), John Dewey (1859-1952), and George Herbert Mead (1863-1931) are the fathers of classical pragmatism, following on from which, in recent times, Richard Bernstein, Donald Davidson, Nelson Goodman, Hilary Putnam and Richard Rorty have been described as neo-pragmatists, which means that they embrace literary criticism and critical theory (Baert 2011; Johnson, RB & Onwuegbuzie 2004).

Peirce, James, and Dewey were all interested in examining practical consequences and empirical findings to help in understanding the import of philosophical positions and, importantly, to help in deciding which action to take next as one attempts to better understand real-world phenomena (including psychological, social, and educational phenomena) (Johnson, RB & Onwuegbuzie 2004, p. 17).

As Baert (2011, p. 26) argues, “[m]ost pragmatist philosophers – old and new – share a number of key ideas, which makes it possible to talk about a pragmatist movement.” Following Baert (2011) through, pragmatism’s common tendencies are: (i) the humanist
perspective, that is “a particular perspective according to which cognitive, ethical and aesthetic claims, including claims about those claims, are intertwined with human projects and are predominantly human creations” (Baert 2011, p. 26); (ii) an anti-foundationalist stance, supposing that “philosophical reflection cannot achieve this position of neutrality because it is, like other intellectual accomplishments, a human activity; and as a human activity, a social activity; and as a social activity, a situated activity” (Baert 2011, p. 27). Hence, every kind of knowledge, such as scientific knowledge, should be considered as capturing only parts of reality. Moreover, Baert (2011, p. 30) argues that “a pragmatist-inspired perspective explores the intricate relationship between method and cognitive interests and refuses to take for granted that explanation and prediction are the only legitimate cognitive interests.” Hence, most pragmatists believe that knowledge claims result from events, circumstances and effects rather than precursor conditions, as happens in postpositivism (Creswell & Plano Clark 2007). On this topic, Johnson, RB and Onwuegbuzie (2004, p. 16) argue that

> [t]he pragmatic rule or maxim or method states that the current meaning or instrumental or provisional truth value [...] of an expression [...] is to be determined by the experiences or practical consequences of belief in or use of the expression in the world.

Concluding with Creswell (2003 p. 12):

> for the mixed methods researcher, pragmatism opens the door to multiple methods, different worldviews, and different assumptions, as well as to different forms of data collection and analysis in the mixed methods study.

### 4.3 Strategies of inquiry

Within the claim selected, a specific strategy of inquiry must be chosen between those frequently used in the social sciences, providing definite guidelines for procedures in a research approach and design (Creswell 2003). Those are strategies associated with the quantitative approach, strategies associated with the qualitative approach and strategies
associated with the mixed methods approach (Creswell 2003). The *quantitative approach* is characterised by a structured and closed research design that aims at finding standard, objective, hard data (Creswell 2003), and have been associated with inquiry strategies of experiments (Keppel 1991) and surveys (Babbie 1990). The *qualitative approach* is an open design, built along the research, where data are rich, profound, soft. The objective is not to have standardised and generalised results (as in the quantitative method), rather to achieve understanding and interpretation of reality (Creswell 2003). Such research approaches rely on the following main strategies of inquiry (Creswell 2003, pp. 14-5): (i) “Ethnographies, in which the researcher studies an intact cultural group in a natural setting over a prolonged period of time by collecting, primarily, observational data”; (ii) “Grounded theory, in which the researcher attempts to derive a general, abstract theory of a process, action, or interaction grounded in the views of participants in a study”; (iii) “Case studies, in which the researcher explores in depth a program, and event, and activity, a process, or one or more individuals”; (iv) “Phenomenological research, in which the researcher identifies the “essence” of human experiences concerning a phenomenon, as described by participants in a study”; (v) “Narrative research, a form of inquiry in which the researcher studies the lives of individuals and asks one or more of those individuals to provide stories about their lives”. Hence, the decision to use one strategy of inquiry in place of another depends on the particular study that has to be conducted.

### 4.3.1 Mixed methods

Using both quantitative and qualitative methods together has advantages and disadvantages and this is probably why researchers started in the 19th century to combine the two methodologies in a *mixed methods approach* (Creswell 2003; Oke 2007). Johnson, RB and Onwuegbuzie (2004, p. 17) define mixed methods research as “the class of research where the researcher mixes or combines quantitative and qualitative research techniques,
methods, approaches, concepts or language into a single study.” Although some theorists argue that qualitative and quantitative methods are incompatible (Howe 1988), as Sale, Lohfeld and Brazil (2002) point out, healthcare research comprises numerous research streams that regularly combine quantitative and qualitative methods (Caracelli & Greene 1993; Caracelli & Riggin 1994; Casebeer & Verhoef 1997; Datta 1997; Droitcour 1997; Greene & Caracelli 1997; House 1994; Morgan 1998; Morse 1991; Tashakkori & Teddlie 1998). Johnson and Onwuegbuzie (2004, pp. 14-5) argue

> [t]he goal of mixed methods research is not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies.

The mixed methods approach can be used for the following main reasons (Creswell 2003): (i) to triangulate data sources to find convergence across quantitative and qualitative methods (Jick 1979); (ii) to use the results of one method to improve the other one (Greene, Caracelli & Graham 1989); (iii) to nest one method within the other one to increase the deepness of the analysis (Tashakkori & Teddlie 1998); (iv) to support marginalised groups of people (Mertens 2003). Creswell (2003, p. 16) illustrates three main strategies associated with the mixed methods approach: (i) “Sequential procedures, in which the researcher seeks to elaborate on or expand the findings of one method with another method”. (ii) “Concurrent procedures, in which the researcher converges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. (iii) “Transformative procedures, in which the researcher uses a theoretical lens as an overarching perspective within a design that contains both quantitative an qualitative data.” The choice of right procedure is related to the research question, because different research questions require different research design.

### 4.4 Considerations on the choice of the knowledge claim and the strategy of inquiry

For the purpose of this thesis, the postpositive paradigm has been chosen because the
research approach has been considered consistent with the requirements of Lee, AS (1991). In this case, the theoretical framework informed the methodological framework, data was collected and tested based on established protocols, and then pattern-matching was used to test the validity of the findings based on past research. This means that the theories have been verified with empirical data (Johnson, P & Duberley 2000). Large samples and validated formalised hypotheses allowed generalisation of the results in other settings on the basis of statistical probability (Lincoln & Guba 2000), and the findings were used to predict behaviour with a level of confidence (Cavana, Delahaye & Sekaran 2001).

The choice of the research paradigm of the proposed study followed those main considerations: (i) starting from the vast body of knowledge of social exchange theory, BOP, and safety culture literature, a deductive approach seems more appropriate than an inductive approach (Creswell 2003); (ii) literature meta-analyses on this field of research reveal that positivist approaches are preponderant, although some interpretivist studies have been reviewed (Choudhry, Fang & Mohamed 2007b; Cropanzano & Mitchell 2005; Graen & Uhl-Bien 1995; Guldenmund 2000). The choice of the strategy of inquiry of the proposed study followed Creswell (2003, 2007) in allowing the social research problem to guide the choice of the specific research approach: quantitative method design has been selected with a concurrent procedure. This study intends to survey a large number of healthcare staff in Italian acute care hospitals.

4.5 Research methods

Within the specific strategy of inquiry identified, research methods to collect and analyse data have to be selected (Creswell 2003). This paragraph examines the methods that the research intends to use to collect the data, followed by a brief presentation of the principal instruments used in the last years to collect data on the topic of this study.
4.5.1 Survey method

The research method chosen to collect quantitative data from a large sample of staff from acute care hospitals on the variables to be assessed to investigate the research questions is the survey method. The survey method has been selected for this research as a rapid and cost-effective tool able to collect accurate quantitative, numerical data from large samples (Creswell 2003; Johnson, RB & Onwuegbuzie 2004), and as a method that offers the opportunity to generalise findings (Johnson, RB & Onwuegbuzie 2004). More details are provided later in the chapter.

4.5.2 Considerations regarding the choice of the research method

As previously analysed, the distinction between climate and culture is blurred, and based on different research traditions: culture researchers tend to prefer qualitative methodologies; conversely, researchers on climate prefer quantitative methodologies, in particular, the use of surveys (e.g. Choudhry, Fang & Mohamed 2007b; Flin et al. 2000; Guldenmund 2000; Zohar 2010). Besides these differences, one convincing distinction is the following: while culture is rooted in the deepest values and in the norms that influence the actions and thoughts of an individual and can be seen through the artefacts (objects and actions), climate is a partial description of culture, obtained from personal perceptions (Tourangeau, Rips & Rasinski 2000).

Climate is the most superficial level of culture: this is why it is possible to say that safety climate is made up of the same components of safety culture, such as managerial behaviour, safety perception from members of the organisation that can be measured by using the survey method (Tourangeau, Rips & Rasinski 2000). The survey instrument does not take into account direct observation of any artefact, analysing people’s perceptions, expressed in the answers to the questionnaires (Hopkins, A 2006; Neuman 2011). Therefore a survey on safety culture cannot tell us anything about behaviours, but can only measure perceived
behaviours by respondents. Hence, it is useful to reflect on the possibility of measuring safety culture (that is artefacts, values, and principles) by surveys only (e.g. Davies et al. 2003; Nieva & Sorra 2003). As above, all those methods have some limitations.

Schein (2000) believes that surveys alone cannot identify well-hidden values and principles, and it is only by using thorough interviews that the values and the principles of the members of an organisation can emerge. According to Schein (2000), scores from surveys on safety culture can be related to several indices of organisational performance. Moreover, observation of artefacts can tell us information only about the past, while a careful and systematic content analysis of interviews data will provide information that is close to what exists at a cognitive level, which is relevant because elements of it could influence future behaviours (Kets De Vries & Miller 1984; Varchetta 1993, 2007; Von Foerster 1996). Thus, observation is important, but its limitation is that cannot fully convey the thought behind the action. The “thought” does not refer only to the present and to the actions being carried out (that can be analysed by observation); however, this is the place where new ideas are embedded that are likely to influence future actions (Bruner 1996).

The last issue to discuss is the instrument’s efficacy. The efficacy of a survey refers to the ability of chosen indicators to represent the entire semantic area of the concept which is being analysed (Corbetta 1999). In the case of the present research, it is relevant to find the best tool (or toolkit) that will obtain information about an issue on which the academic community is divided. This is probably why literature highlights a wide range of methods to find out information about patient safety in the healthcare sector. Each method refers to a different definition of the concept of safety culture, with the use of different indicators to measure it. The debate is still open and it will be a long time before we get to a unique and scientifically agreed definition about the culture of patient safety. Between them, the role of a questionnaire may be used more to highlight the cognitive aspects, which would otherwise
remain hidden. This could give the researcher the possibility to infer, even if with a high level of uncertainty, the basis on which an evidence-based decision could be reliably made (Bruner 1996; Tourangeau, Rips & Rasinski 2000; Vygotskij 1987; Weick & Roberts 1993).

As summarised so well by Guldenmund (2000, p. 235):

> [g]iven the fact that most researchers focus on beliefs, perceptions and attitudes, these relevant aspects are then the objects of those mental processes. With regard to these aspects, questions are formulated, which are then pre-tested in a pilot study on a relevant population. If the pilot study goes satisfactorily, the questionnaire can be distributed among the target population. The results of this survey are then subjected to certain standard analysis methods like factor analysis (FA) or principal components analysis (PCA) (Tabachnick & Fidell 1989; Tatsuoka & Lohnes 1988), where linear relations between the questions or variables are assumed, or techniques like HOMALS or PRINCALS (Van de Geer 1993a, 1993b), where such linearity is not assumed. These analyses result in factors, principal components or dimensions […].

### 4.5.3 Safety climate and culture surveys

Safety climate and culture surveys are more and more frequently used by many healthcare organisations, and there are several measurement tools that have been developed for this aim (Flin et al. 2006; Sexton et al. 2006). So, it could be useful to look at some of the main surveys that have so far been used to measure safety climate and culture (Singla et al. 2006).

a. “The Stanford/PSCI Culture Survey” (Singer et al. 2003) is used to measure safety culture and climate in different hospitals and with different people involved.

b. “The Safety attitudes questionnaire” (Sexton et al. 2006) is an easy and quick tool to use since the survey is really short. It is been tested in many countries. However, it is not clear why certain potentially relevant dimensions have not been explored. It is a good tool if one needs to reduce the number of questions to follow changes over time.

c. “The Hospital Survey on Patient Safety Culture” (Nieva & Sorra 2003; Sorra &
Dyer 2010). This is a tool that can capture the relevance of safety issues to the staff within a healthcare organisation. One of the main objectives of the tool is to give staff feedback to reinforce their awareness about the importance of patient safety and of a positive safety culture. It is for public use and therefore a freely available safety culture survey (Nieva & Sorra 2003), funded by the Agency for Healthcare Research and Quality (AHRQ), and one that hospitals can administer on their own to assess patient safety culture from the perspective of their employees. The instrument has been used previously in Italian acute care hospitals (Brusoni et al. 2009). The use of this tool can have multiple purposes from an individual organisation’s perspective, but can also allow the healthcare organisations’ managers to compare themselves against those in the USA. However, as the AHRQ underlines, the usefulness of safety culture assessment data depends on: (i) involving key stakeholders; (ii) using effective data collection procedures; (iii) implementing action planning and initiating change. There are twelve dimensions of values offered: Supervisor/Manager Expectations and Actions Promoting Patient Safety, Staffing, Management Support for Patient Safety, Organisational Learning-Continuous Improvement, Feedback and Communication About Error, Communication Openness, Frequency of Events Reported, Non-punitive Response to Errors, Handoffs and Transitions, Overall Perceptions of Patient Safety, Teamwork within and across units.

There are some differences in the focus of the research of the tools examined and on its effectiveness in understanding the phenomena studied. In particular, “The Stanford/PSCI Culture Survey” and “The Hospital Survey on Patient Safety Culture” are aimed at a wider range of hospital wards and respondents. Therefore, the items used in the questionnaire are necessarily more general, less focused on the specific competencies of each professional role and group. A tool such as “The Hospital Survey on Patient Safety Culture” has in theory a great potential to plan managerial tools of intervention, compared to the more limited tools,
such as “The Safety Climate Survey”, which is more limited in its research objectives and is less precise in the possibility to find critical areas that need specific intervention. However, shorter questionnaires can be completed in less time and have, therefore, a higher response rate compared to longer questionnaires. The survey prepared by Sexton is structured for operational units, therefore items reflect the specific contents of each specific unit. On the other hand, the Sorra and Nieva survey is a unique questionnaire, despite the differences among the operational units. Furthermore, Sexton’s questionnaire is more oriented towards safety climate than safety culture. On the other hand, the Sorra and Nieva questionnaire seems to be easier to translate into tangible management tools. The general aims, the contents, the target population, the measures, results validation, data availability, and the points of strength and weakness of each tool are reported in Table 4-1 (Fleming 2005).

Table 4-1 – Aims, contents, target population, measures, results validation, data availability, points of strength and weakness (Fleming 2005)

<table>
<thead>
<tr>
<th>Tool</th>
<th>Stanford/PSCI culture survey</th>
<th>Safety attitudes questionnaire</th>
<th>The Hospital Survey on Patient Safety Culture – Agency for Healthcare Research and Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim and tool description</strong></td>
<td>To measure and understand patient safety culture behaviours and organisational culture and how such behaviours vary from one hospital to another, from one unit to another, from one professional to another.</td>
<td>To obtain information about safety perceptions of front-line workers and managerial engagement towards safety. To show possible differences among departments. Its repetition over time allows the establishment of intervention programs and verification of its impact. It is, therefore, a tool that can help to develop, enhance and monitor changes in safety culture.</td>
<td>To help hospitals in determining the level of engagement of their cultural components in highlighting the importance of patient safety; how hospitals encourage open dialogue and discussion of errors; how they create an environment of continuous learning and improvement, rather than simply a culture of guilt and punishment.</td>
</tr>
<tr>
<td><strong>Construction and development</strong></td>
<td>Adapted from five previous American questionnaires (aviation and healthcare).</td>
<td>-</td>
<td>Developed from literature on errors, failures, reporting systems; on existing surveys on safety culture; on interviews with hospital staff and management.</td>
</tr>
<tr>
<td><strong>Tool</strong></td>
<td><strong>Stanford/PSCI culture survey</strong></td>
<td><strong>Safety attitudes questionnaire</strong></td>
<td><strong>The Hospital Survey on Patient Safety Culture – Agency for Healthcare Research and Quality</strong></td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Dimensions and items</strong></td>
<td>16 dimensions – 30 items.</td>
<td>Non identified dimensions – 19 items.</td>
<td>12 dimensions – 42 items gathered in 4 sub-groups: unit level, hospital level, variable outcomes, other measures.</td>
</tr>
<tr>
<td><strong>Test and application</strong></td>
<td>15 hospitals in California, sample of 6,312, response rate of 47.4%.</td>
<td>Several hospitals both in the USA and in Europe.</td>
<td>Pilot in 12 hospitals in 2003 in the USA.</td>
</tr>
<tr>
<td><strong>History of tests and results</strong></td>
<td>After the first draft 82 items; with the final draft 30 items plus socio-demographic data, leaving at least 1-2 items per dimension.</td>
<td>Results of the second survey show an improvement in staff perception of safety culture, in relation to error reduction, shifts system.</td>
<td>The psychometric analysis (reliability analysis, correlations analysis and variance) provides solid empiric evidence that supports the 12 dimensions and 42 items.</td>
</tr>
<tr>
<td><strong>Validation</strong></td>
<td>Pilot test, internal consistency and dimensional test. The five factors highlighted (organisation, department, production, reporting and research of help, awareness) are different from other dimensions. No external validation.</td>
<td>Pilot test, consistency tests. No other information available on validation.</td>
<td>-</td>
</tr>
</tbody>
</table>
| **Elements measured** | • Organisation  
• Department  
• Production  
• Reporting/seeking help  
• Shame/self-awareness | • Teamwork  
• Safety climate  
• Job satisfaction  
• Stress recognition  
• Perceptions of management  
• Working conditions | • Supervisor/Manager expectations and actions  
• Organisational learning  
• Teamwork within units  
• Communication openness  
• Feedback and communication about error  
• Non-punitive response to error  
• Staffing  
• Hospital management support for patient safety  
• Teamwork across hospital units  
• Hospital handoffs and transitions  
• Self-reported outcome variables |
<table>
<thead>
<tr>
<th>Tool</th>
<th>Stanford/PSCI culture survey</th>
<th>Safety attitudes questionnaire</th>
<th>The Hospital Survey on Patient Safety Culture – Agency for Healthcare Research and Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Practicality</strong></td>
<td>Rather short, 30 items.</td>
<td>Accompanied by guidelines; easy to complete and manage; it provides a good sample of data on which it is possible to carry out statistical analysis.</td>
<td>Long questionnaire.</td>
</tr>
<tr>
<td><strong>Job orientation</strong></td>
<td>It tries to cover all hospital personnel and different qualifications.</td>
<td>Specifically for front-line workers.</td>
<td>It tries to cover all hospital personnel and different qualifications.</td>
</tr>
<tr>
<td><strong>Setting appropriate for use</strong></td>
<td>General</td>
<td>Multiple units</td>
<td>General</td>
</tr>
<tr>
<td><strong>Common dimensions covered</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- leadership</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- policies and procedures</td>
<td>Partial</td>
<td>Partial</td>
<td>Partial</td>
</tr>
<tr>
<td>- staffing</td>
<td>Partial</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- communication</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- reporting</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Psychometrics performed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Items analysis</td>
<td>Partial</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- Cronbach’s alpha</td>
<td>No</td>
<td>0.68-0.81</td>
<td>0.63-0.83</td>
</tr>
<tr>
<td><strong>How used in studies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- intra institutional comparisons</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>- inter institutional comparisons</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Documentation and availability</strong></td>
<td>Documentation published (Singer et al., 2003). Results have been made available directly by the authors.</td>
<td>Developed in collaboration with Texas Centre of Patient Safety Research and Practice, University of Texas (Sexton, J.B., Helmreich, R., Thomas, E.) and Johns Hopkins hospital (Peter Pronovost). <a href="http://www.uth.tmc.edu/schools/med/imed/patientsafety/surveyandtools.htm">http://www.uth.tmc.edu/schools/med/imed/patientsafety/surveyandtools.htm</a></td>
<td>Documentation published (Sorra &amp; Nieva, 2004). <a href="http://www.ahrq.gov/qual/hospculture/">www.ahrq.gov/qual/hospculture/</a></td>
</tr>
</tbody>
</table>
After a critical analysis of the AHRQ’s instrument (Trinchero & Farr-Wharton 2015), using a qualitative meta-analysis of previous studies, and more sophisticated statistical tests for validity and reliability of the tool using data collected from Italian acute care hospitals, very few applications of the tool have delivered reliable findings. And so, previous results concerning the true nature of safety culture in assessed hospitals can be considered spurious. In order to have a better representation as to the true nature of patient safety culture in hospitals a more effective and reliable measure needs to be developed and immediate attention should be given to this by researchers. A more reliable statistical measure will help compare and improve safety culture and patient care globally. Hence, starting from the knowledge that the development of such a scale is of paramount importance, this thesis’s project has designed and tested a new model informed by the literature to assess safety culture among staff. It is tested within Italian acute care hospitals.
4.6 Design, population setting, sample

This research uses a cross-sectional design to gather data from healthcare professionals in Italian acute care hospitals to operationalise and test a new comprehensive model of safety culture within healthcare organisations, and test whether SET factors (LMX, Safety LMX, Engagement) and POB factors (PsyCap) predict accreditation and safety culture in a causal chain.

As previously discussed, the technique that will be used is surveying. Data will be collected using a survey-based, self-report strategy.

The premise of the research is that the present assessment tool of patient safety culture has low reliability. The present method used to test Italian hospitals data is the US’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture (HSPOSC) (Nieva & Sorra 2003). HSPOSC is one of the most frequently applied, and industry-accessible, tools for interrogating hospitals’ safety culture worldwide. Hence, an important task was to analyse the reliability of the tool presently being used. Using a survey approach, the following steps were followed:

The first step of the research investigates how LMX and engagement affect the situational, psychological, and behavioural aspects of safety culture.

The second step of the research investigates how Safety LMX and PsyCap affect accreditation culture as a second order variable (comprising situational, psychological and behavioural components variables) and safety culture as a second order variable (comprising situational, psychological and behavioural components variables).

The study uses a positivist methodological approach to empirically test a model using Structural Equation Modelling (IBM SPSS Amos Version 22 Software).
4.6.1 Survey design

The survey’s design process comprises the following actions, according to the measures used. The measures are generated from the literature and have been presented using statements to be rated on a 6-point Likert-type scale, with 1 = strongly disagree, ranging to 6 = strongly agree. The fine-tuning for the Italian context of internationally validated measures to assess the following variables have been done using the measures’ back translation (McGorry 2000) and face validity (Neuman 2011), conducted through a panel of experts chosen from well-known Italian hospitals. The pilot test has also been conducted using focus groups with senior managers of healthcare professionals of the hospitals’ sample to ensure the instrument is able to provide a valid and reliable measure (Neuman 2011). According to Neuman (2011, p. 314), “respondents should quickly grasp each questions’ meaning as […] intended, answer completely and honestly, and believe that their answers are meaningful”. The measures have also been tested using focus groups with senior managers of healthcare professionals of the hospitals’ sample to ensure that the instrument is industry relevant.

The variables tested are listed above:

a) Demographic Information. Although the anonymity of the respondents has been guaranteed, the demographic information questions presented in Table 4-2 have been included.

Table 4-2 – Demographic Information

<table>
<thead>
<tr>
<th>English Items</th>
<th>Italian Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your year of birth?</td>
<td>Anno di nascita</td>
</tr>
<tr>
<td>What is your gender?</td>
<td>Sesso</td>
</tr>
<tr>
<td>What is your highest educational qualification?</td>
<td>Quale è il titolo di studio più elevato che ha conseguito?</td>
</tr>
<tr>
<td>How long have you worked since completing training?</td>
<td>Anni di esperienza</td>
</tr>
<tr>
<td>What type of ward are you mainly in?</td>
<td>Area o Dipartimento di appartenenza</td>
</tr>
<tr>
<td>What is your position?</td>
<td>Ruolo attualmente ricoperto</td>
</tr>
<tr>
<td>Employment Contract</td>
<td>Contratto di lavoro</td>
</tr>
</tbody>
</table>
b) **Leader-Member Exchange - LMX** (Graen & Uhl-Bien 1995). The Italian version of the seven-item Leader-Member Exchange Scale – LMX-7 – used (Trinchero, Borgonovi & Farr-Wharton 2014), is presented in Table 4-3. The first item of this scale was removed to enhance overall model fit, leaving a composite reliability coefficient of .95 and an average variance estimate of .76.

Table 4-3 – LMX-7 (Graen & Uhl-Bien 1995; Trinchero, Borgonovi & Farr-Wharton 2014)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>My supervisor is satisfied with my work</td>
<td>Il mio referente è soddisfatto del mio lavoro</td>
<td>LMX1</td>
</tr>
<tr>
<td>My supervisor understands my work problems and needs</td>
<td>Il mio referente capisce le problematiche e i bisogni del mio lavoro</td>
<td>LMX2</td>
</tr>
<tr>
<td>My supervisor recognises my potential</td>
<td>Il mio referente riconosce il mio potenziale</td>
<td>LMX3</td>
</tr>
<tr>
<td>My supervisor is willing to use her/his power to help me solve work problems</td>
<td>Il mio referente vuole utilizzare il suo potere organizzativo per aiutarmi a risolvere i problemi di lavoro</td>
<td>LMX4</td>
</tr>
<tr>
<td>My supervisor would be willing to help in her/his own time</td>
<td>Il mio referente è disponibile ad impiegare il suo tempo per aiutarmi</td>
<td>LMX5</td>
</tr>
<tr>
<td>I have enough confidence in my supervisor that I would defend and justify her/his decision if s/he were not present to do so</td>
<td>Ho così fiducia nel mio referente che difenderei e giustificherei le sue decisioni in sua assenza</td>
<td>LMX6</td>
</tr>
<tr>
<td>I have a good working relationship with my supervisor</td>
<td>Ho una buona relazione di lavoro con il mio referente</td>
<td>LMX7</td>
</tr>
</tbody>
</table>

Table 4-3 – LMX-7 (Graen & Uhl-Bien 1995; Trinchero, Borgonovi & Farr-Wharton 2014)


c) **Safety component of the supervisor-employee relationship - Safety LMX** (Trinchero, Farr-Wharton & Brunetto 2017) was captured using a high-order factor that combines:

a. six of seven items from the leader-member exchange unidimensional scale (LMX-7) (the first item of this scale was removed to enhance overall model fit), developed by Graen and Uhl-Bien (1995);

b. two items from Hofmann and Morgeson’s (1999) seven-item safety communication scale. Kath, Marks, and Ranney (2010) used Hofmann and Morgeson’s instrument with a good internal consistency (.86);

It possesses good reliability with a composite reliability of .94, and an average variance extracted score of .71 (see Table 4-4).

Table 4-4 – Safety LMX (Trinchero, Farr-Wharton & Brunetto 2017)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>My supervisor understands my work problems and needs</td>
<td>Il mio referente capisce le problematiche e i bisogni del mio lavoro</td>
<td>LMX2</td>
</tr>
<tr>
<td>My supervisor recognises my potential</td>
<td>Il mio referente riconosce il mio potenziale</td>
<td>LMX3</td>
</tr>
<tr>
<td>My supervisor is willing to use their power to help me solve work problems</td>
<td>Il mio referente vuole utilizzare il suo potere organizzativo per aiutarmi a risolvere i problemi di lavoro</td>
<td>LMX4</td>
</tr>
<tr>
<td>My supervisor would be willing to help in their own time</td>
<td>Il mio referente è disponibile ad impiegare il suo tempo per aiutarmi</td>
<td>LMX5</td>
</tr>
<tr>
<td>I have enough confidence in my supervisor that I would defend and justify their decision if they were not present to do so</td>
<td>Ho così fiducia nel mio referente che difenderei e giustificherei le sue decisioni in sua assenza</td>
<td>LMX6</td>
</tr>
<tr>
<td>I have a good working relationship with my supervisor</td>
<td>Ho una buona relazione di lavoro con il mio referente</td>
<td>LMX7</td>
</tr>
<tr>
<td>My supervisor openly accepts ideas for improving safety</td>
<td>Il mio referente è disposto ad accettare suggerimenti per migliorare la sicurezza dei pazienti</td>
<td>Safety Communication (Hofmann &amp; Morgeson 1999) Item 4</td>
</tr>
<tr>
<td>My supervisor encourages open communication about safety</td>
<td>Il mio referente incoraggia una comunicazione aperta sul tema della sicurezza</td>
<td>Safety Communication (Hofmann &amp; Morgeson 1999) Item 6</td>
</tr>
<tr>
<td>My supervisor monitors us more closely when a team member violates a safety rule</td>
<td>Il mio referente innalza il livello di controllo se qualcuno viola le procedure che impattano sulla sicurezza dei pazienti</td>
<td>Managerial Safety Practices (Katz-Navon, Naveh &amp; Stern 2005) Item 2</td>
</tr>
<tr>
<td>My supervisor considers safety performance in performance evaluations and in promotion reviews</td>
<td>Il mio referente tiene conto del rispetto delle procedure che impattano sulla sicurezza dei pazienti nella valutazione individuale dello staff</td>
<td>Managerial Safety Practices (Katz-Navon, Naveh &amp; Stern 2005) Item 3</td>
</tr>
</tbody>
</table>
d) The employees’ engagement was measured using four items (items EE6, EE7, EE8, and EE9 displayed in Table 4-5) from Schaufeli and Bakker (2003), originally a nine-item scale. The Italian version of the nine-item employees’ engagement scale used (Trinchero, Borgonovi & Farr-Wharton 2014; Trinchero, Brunetto & Borgonovi 2013; Trinchero, Farr-Wharton & Borgonovi 2017) is presented in Table 4-5. The reduced scale has reasonable internal reliability as indicated by the composite reliability coefficient of .88 and an average variance estimate of .65.

Table 4-5 – Employees’ engagement (Schaufeli & Bakker 2003; Trinchero, Borgonovi & Farr-Wharton 2014; Trinchero, Brunetto & Borgonovi 2013; Trinchero, Farr-Wharton & Borgonovi 2017)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>At my work, I feel bursting with energy</td>
<td>Il lavoro mi dà energia</td>
<td>EE1</td>
</tr>
<tr>
<td>I find the work that I do full of meaning and purpose</td>
<td>Trovo che il lavoro che faccio sia pieno di significato e abbia uno scopo</td>
<td>EE2</td>
</tr>
<tr>
<td>Time flies when I’m working</td>
<td>Quando sto lavorando il tempo vola</td>
<td>EE3</td>
</tr>
<tr>
<td>When I get up in the morning, I feel like going to work</td>
<td>Quando mi sveglio, sono contento di andare a lavorare</td>
<td>EE4</td>
</tr>
<tr>
<td>I am enthusiastic about my job</td>
<td>Sono entusiasta del mio lavoro</td>
<td>EE5</td>
</tr>
<tr>
<td>I am immersed in my work</td>
<td>Sono completamente calato nel mio lavoro</td>
<td>EE6</td>
</tr>
<tr>
<td>I persevere, even when things do not go well</td>
<td>Sono perseverante nel lavoro anche quando le cose non vanno bene</td>
<td>EE7</td>
</tr>
<tr>
<td>I am proud of the work that I do</td>
<td>Sono orgoglioso del lavoro che faccio</td>
<td>EE8</td>
</tr>
<tr>
<td>I feel happy when I am working intensely</td>
<td>Sono felice quando lavoro intensamente</td>
<td>EE9</td>
</tr>
</tbody>
</table>
e) To measure PsyCap, the shortened scale of Luthans, Youssef and Avolio (2007) has been utilized (Brunetto et al. 2016). The Italian version of the PsyCap scale used is presented in Table 4-6 (Trinchero, Farr-Wharton & Brunetto 2017). It possessed good reliability with a composite reliability of .91, and an average variance extracted score of .72. The first item of this scale was removed to enhance overall model fit, leaving a composite reliability of .94 and an average variance estimate of .71.

Table 4-6 – PsyCap (Brunetto et al. 2016; Luthans, Youssef & Avolio 2007; Trinchero, Farr-Wharton & Brunetto 2017)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel confident in representing my work area in meetings with management</td>
<td>Sono sicuro di saper ben rappresentare la mia area di lavoro negli incontri con la direzione</td>
<td>PsyCap 1</td>
</tr>
<tr>
<td>I feel confident contributing to discussions about my workplace’s strategy</td>
<td>Sono in grado di dare un contributo alla discussione sulle strategie che riguardano la mia attività</td>
<td>PsyCap 2</td>
</tr>
<tr>
<td>I feel confident helping to set targets/goals in my work area</td>
<td>Sono sicuro di poter contribuire nella definizione degli obiettivi per la mia area di attività</td>
<td>PsyCap 3</td>
</tr>
<tr>
<td>Right now I see myself as being pretty successful at work</td>
<td>Al momento ritengo di avere un discreto successo nel mio lavoro</td>
<td>PsyCap 4</td>
</tr>
<tr>
<td>I can think of many ways to reach my current work goals</td>
<td>So identificare diverse modalità per raggiungere i miei attuali obiettivi di lavoro</td>
<td>PsyCap 5</td>
</tr>
<tr>
<td>At this time, I am meeting the goals that I have set for myself</td>
<td>Attualmente, sto raggiungendo gli obiettivi che mi sono prefissato</td>
<td>PsyCap 6</td>
</tr>
<tr>
<td>I usually manage difficulties, one way or another, at work</td>
<td>In un modo o nell’altro, riesco solitamente a gestire i problemi di lavoro</td>
<td>PsyCap 7</td>
</tr>
<tr>
<td>I can get through difficult times at work because I’ve experienced difficulty before</td>
<td>La mia esperienza pregressa mi aiuta a gestire le difficoltà sul lavoro</td>
<td>PsyCap 8</td>
</tr>
<tr>
<td>I feel I can handle many things at a time at this job</td>
<td>Credo di saper gestire più attività contemporaneamente connesse al mio lavoro</td>
<td>PsyCap 9</td>
</tr>
<tr>
<td>When things are uncertain for me at work, I usually expect the best.</td>
<td>Solitamente ho una attitudine positiva nei momenti di incertezza al lavoro</td>
<td>PsyCap 10</td>
</tr>
<tr>
<td>I always look on the bright side of things regarding my job</td>
<td>Sono sempre portato ad enfatizzare gli aspetti migliori del mio lavoro</td>
<td>PsyCap 11</td>
</tr>
<tr>
<td>I’m optimistic about what will happen to me in the future as it pertains to work</td>
<td>Sono ottimista rispetto a ciò che mi potrà accadere nel mio lavoro</td>
<td>PsyCap 12</td>
</tr>
</tbody>
</table>

f) The situational component of safety culture (Trinchero 2016) was captured by three of the four-item Katz-Navon, Naveh and Stern (2005) safety procedures’ scale adapted from Brunsson and Jacobsson (2000) and employees’ satisfaction with (safety) training adapted
by Brunetto et al. (2016) from Meyer, JP, Allen and Smith (1993). As a higher-order variable, the combined scale has reasonable internal reliability as indicated by the composite reliability coefficient of .77 and an average variance estimate of .62.

Table 4-7 – Situational component of safety culture (Trinchero 2016)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my unit, the safety procedures are relate to all work-related issues</td>
<td>Nella mia unità operativa ci sono procedure per la sicurezza dei pazienti per ogni attività</td>
<td>Safety Procedures 2</td>
</tr>
<tr>
<td>In my unit, the safety procedures are detailed</td>
<td>Nella mia unità operativa le procedure per la sicurezza dei pazienti sono molto dettagliate</td>
<td>Safety Procedures 3</td>
</tr>
<tr>
<td>In my unit, safety procedures are extensive</td>
<td>Nella mia unità operativa le procedure per la sicurezza dei pazienti riguardano tutte le situazioni di rischio potenziale</td>
<td>Safety Procedures 4</td>
</tr>
<tr>
<td>The hospital places the right amount of emphasis or importance on training on patient safety issues</td>
<td>L’ospedale pone la giusta enfasi sull’importanza della formazione per la sicurezza dei pazienti</td>
<td>Safety Training 1</td>
</tr>
<tr>
<td>I am happy with the training opportunities provided for me in this hospital on patient safety issues</td>
<td>Sono contento delle opportunità di formazione per la sicurezza dei pazienti messe a disposizione per me in questo ospedale</td>
<td>Safety Training 2</td>
</tr>
<tr>
<td>There are lots of training opportunities provided for me in this hospital on patient safety issues</td>
<td>Ci sono molte opportunità di formazione per la sicurezza dei pazienti messe a disposizione per me in questo ospedale</td>
<td>Safety Training 3</td>
</tr>
<tr>
<td>The training on patient safety issues I have received so far has helped me to do my job more safely</td>
<td>La formazione per la sicurezza dei pazienti che ho ricevuto fino ad ora mi ha aiutato a svolgere il mio lavoro in modo più sicuro per il paziente</td>
<td>Safety Training 4</td>
</tr>
<tr>
<td>I am satisfied with the training on patient safety issues I have received so far</td>
<td>Sono soddisfatto della formazione per la sicurezza dei pazienti che ho ricevuto fino ad oggi</td>
<td>Safety Training 5</td>
</tr>
<tr>
<td>My hospital gives me lots of opportunities to develop my competence on safety issues</td>
<td>Il mio ospedale mi fornisce molte opportunità di accrescere le mie competenze sulla sicurezza</td>
<td>Safety Training 6</td>
</tr>
</tbody>
</table>

g) The psychological component of safety culture (Trinchero 2016) was captured by four of the seven-item scale of Katz-Navon et al.’s (2005) priority of safety scale adapted from (Zohar 2000). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .92 and an average variance estimate of .74.
Table 4-8 – Psychological component of safety culture (Trinchero 2016)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>In my unit whenever pressure builds up, the preference is to do the job as</td>
<td>Nella mia unità operativa quando siamo sotto pressione, si decide di fare il lavoro</td>
<td>Safety Priority 2</td>
</tr>
<tr>
<td>fast as possible, even if that means compromising on safety</td>
<td>più velocemente possibile, persino se ciò significa scendere a compromessi con la</td>
<td></td>
</tr>
<tr>
<td></td>
<td>sicurezza dei pazienti</td>
<td></td>
</tr>
<tr>
<td>In my unit safety rules and procedures are ignored</td>
<td>Nella mia unità operativa le procedure per la sicurezza dei pazienti vengono ignorete</td>
<td>Safety Priority 3</td>
</tr>
<tr>
<td>In my unit ignoring safety is acceptable</td>
<td>Nella mia unità operativa è accettato non curarsi della sicurezza dei pazienti</td>
<td>Safety Priority 4</td>
</tr>
<tr>
<td>In my unit it does not matter how the work is done as long as there are no</td>
<td>Nella mia unità operativa non importa come viene svolta l’attività, basta che non</td>
<td>Safety Priority 6</td>
</tr>
<tr>
<td>accidents</td>
<td>ci siano incidenti</td>
<td></td>
</tr>
</tbody>
</table>

h) The behavioural component of safety culture (Trinchero 2016) was captured using a high-order factor that combined a safety compliance scale (Neal & Griffin 2006) and in-role (safety) performance (Brunetto et al.’s (2016) version of Williams and Anderson’s (1991) conceptual framework) to analyse the extent to which staff adopt safety behaviours expected by the organisation (see Table 4-9). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .93 and an average variance estimate of .87.

Table 4-9 – Behavioural component of safety culture (Trinchero 2016)

<table>
<thead>
<tr>
<th>Original items</th>
<th>Italian validated items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>I complete my work tasks safely</td>
<td>Porto a termine le mie attività in modo sicuro</td>
<td>IRSP 1</td>
</tr>
<tr>
<td>I fulfil safety responsibilities specified in my job description</td>
<td>Mi assumo le responsabilità sulla sicurezza proprie del mio ruolo</td>
<td>IRSP 2</td>
</tr>
<tr>
<td>I perform safety tasks that are expected</td>
<td>Nello svolgimento della mia attività, rispetto le procedure per la sicurezza</td>
<td>IRSP 3</td>
</tr>
<tr>
<td>I meet formal safety performance requirement of my job</td>
<td>Garantisco l’adesione alle procedure sulla sicurezza formalmente richieste</td>
<td>IRSP 4</td>
</tr>
<tr>
<td>I use all the necessary safety equipment to do my job</td>
<td>Uso tutte le necessarie protezioni per svolgere la mia attività</td>
<td>Safety Compliance 1</td>
</tr>
<tr>
<td>I use the correct safety procedures for carrying out my job</td>
<td>Seguo correttamente le procedure per la sicurezza dei pazienti per svolgere la mia</td>
<td>Safety Compliance 2</td>
</tr>
<tr>
<td></td>
<td>attività</td>
<td></td>
</tr>
<tr>
<td>I ensure the highest levels of safety when I carry out my job</td>
<td>Assicuro il più alto livello di sicurezza dei pazienti quando faccio il mio lavoro</td>
<td>Safety Compliance 3</td>
</tr>
</tbody>
</table>
i) *The accreditation culture’s measure* (Trinchero, Farr-Wharton & Brunetto 2017) has been developed from Cooper’s (2000) model. It comprises a six-item scale used to capture the situational component of accreditation culture (e.g. “My hospital promotes training initiatives on accreditation”, for the complete variable see Table 4-10); a six-item scale used to capture the psychological component of accreditation culture (e.g. “I believe that knowledge of the accreditation standards might change staffs’ way of working”, for the complete variable see Table 4-11); and a four-item scale used to capture the behavioural component of accreditation culture (e.g. “I report to my hospital board the non-compliance with accreditation standards”, for the complete variable see Table 4-12). The measure has good reliability with a composite reliability score of .81, and an average variance extracted score of .59.

<table>
<thead>
<tr>
<th>English items</th>
<th>Italian original items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>My hospital board promotes training initiatives on institutional accreditation</td>
<td>La direzione del mio ospedale promuove iniziative formative sul tema dell’accreditamento</td>
<td>SitAC 1</td>
</tr>
<tr>
<td>My hospital board verifies compliance to the accreditation standards</td>
<td>La direzione del mio ospedale verifica l’adesione agli standard di accreditamento</td>
<td>SitAC 2</td>
</tr>
<tr>
<td>My hospital board is willing to listen to me about the issues related to compliance with the accreditation standards</td>
<td>La direzione del mio ospedale è disponibile ad ascoltarmi sui problemi legati al rispetto degli standard di accreditamento</td>
<td>SitAC 3</td>
</tr>
<tr>
<td>My hospital board assess the compliance of accreditation standards</td>
<td>La direzione del mio ospedale mette in atto verifiche per valutare l’applicazione degli standard di accreditamento</td>
<td>SitAC 4</td>
</tr>
<tr>
<td>My hospital board organises meetings on the accreditation system</td>
<td>La direzione del mio ospedale organizza momenti di approfondimento sul sistema di accreditamento</td>
<td>SitAC 5</td>
</tr>
<tr>
<td>My hospital board asks me to report non-compliance with accreditation standards</td>
<td>La direzione del mio ospedale mi sollecita a segnalare le non conformità agli standard di accreditamento</td>
<td>SitAC 6</td>
</tr>
</tbody>
</table>
Table 4-11 – Psychological component of accreditation culture (Trinchero, Farr-Wharton & Brunetto 2017)

<table>
<thead>
<tr>
<th>English items</th>
<th>Italian original items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that it is very useful to participate in training initiatives on the accreditation system</td>
<td>Ritengo che partecipare ad iniziative di formazione sul sistema di accreditamento sia molto utile</td>
<td>PsyAC 1</td>
</tr>
<tr>
<td>I think that compliance with accreditation standards guarantees patient safety</td>
<td>Penso che il rispetto degli standard di accreditamento garantisca la sicurezza del paziente</td>
<td>PsyAC 2</td>
</tr>
<tr>
<td>I believe that the accreditation system is created to reduce the risks for the patient</td>
<td>Credo che il sistema di accreditamento sia nato per diminuire i rischi per il paziente</td>
<td>PsyAC 3</td>
</tr>
<tr>
<td>I think that the assessment of the accreditation standards is useful to improve clinical pathways’ safety</td>
<td>Penso che le iniziative di valutazione degli standard di accreditamento siano utili per migliorare la sicurezza dei processi diagnostico assistenziali</td>
<td>PsyAC 4</td>
</tr>
<tr>
<td>I believe that knowledge of the accreditation standards might change staff’s’ way of working</td>
<td>Sono convinto che la conoscenza degli standard di accreditamento possa cambiare il modo di lavorare degli operatori</td>
<td>PsyAC 5</td>
</tr>
<tr>
<td>I think that the knowledge of the accreditation standards have reduced the possibility of mistakes in my work</td>
<td>Credo che la conoscenza dei requisiti di accreditamento abbia ridotto la possibilità di errori nel mio lavoro</td>
<td>PsyAC 6</td>
</tr>
</tbody>
</table>

Table 4-12 – Behavioural component of accreditation culture (Trinchero, Farr-Wharton & Brunetto 2017)

<table>
<thead>
<tr>
<th>English items</th>
<th>Italian original items</th>
<th>Item ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>I participate in training initiatives that are proposed to me on the accreditation issue</td>
<td>Partecipo alle iniziative formative che mi vengono proposte sul tema dell’accreditamento</td>
<td>BehAC 1</td>
</tr>
<tr>
<td>I keep updated on the accreditation requirements</td>
<td>Mi tengo aggiornato sui requisiti di accreditamento</td>
<td>BehAC 2</td>
</tr>
<tr>
<td>I report to my hospital board the non-compliance with accreditation standards</td>
<td>Segnalo alla direzione del mio ospedale le non conformità agli standard di accreditamento</td>
<td>BehAC 3</td>
</tr>
<tr>
<td>I ensure sharing opportunities among my staff on accreditation issues</td>
<td>Creo momenti di condivisione tra il mio staff sui temi dell’accreditamento</td>
<td>BehAC 4</td>
</tr>
</tbody>
</table>

4.6.2 Identification of the research panel, survey submission, and data analysis

In the following sections, the Italian context, with particular focus on the public and private not-for-profit healthcare sector, has been presented, along with the research panel, survey submission process and data analysis of the three steps of the research. Particularly, the research panel, survey submission process and data analysis of the research premise is
presented in par. 4.6.2.2, the research panel, survey submission process and data analysis of the first step of the research is presented in par. 4.6.2.3, and the research panel, survey submission process and data analysis of the second step of the research is presented in par. 4.6.2.4.

4.6.2.1 The Italian context

The Italian Health System is made up of 21 Regional Systems (see Table 4-13); each of them has developed its own Accreditation System, which addresses quality issues for the HCOs belonging to the Region (Ferrè & Ricci 2011). In 1995, the introduction of the DRG\(^1\)-based reimbursement system for public and private acute care accredited hospitals led to a general revision of the managerial system and a decline of hospital technical efficiency within the entire Italian healthcare sector (Barbetta, Turati & Zago 2004; Berta et al. 2010; Trinchero, Brunetto & Borgonovi 2013).

Table 4-13 – Italian GDP and population (ISTAT 2016)

<table>
<thead>
<tr>
<th>Region Description</th>
<th>2015 GNP (millions of euro)</th>
<th>2016 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italy</td>
<td>1 642 443.8</td>
<td>60 665 551</td>
</tr>
<tr>
<td>North (Piemonte, Valle d’Aosta / Vallée d’Aoste, Liguria, Lombardia, Trentino Alto Adige / Südtirol, Veneto, Friuli-Venezia Giulia, Emilia-Romagna)</td>
<td>915 653.5</td>
<td>27 754 578</td>
</tr>
<tr>
<td>Centre (Toscana, Umbria, Marche, Lazio)</td>
<td>354 166.4</td>
<td>12 067 803</td>
</tr>
<tr>
<td>South and Islands (Abruzzo, Molise, Campania, Puglia, Basilicata, Calabria, Sicilia, Sardegna)</td>
<td>371 291.7</td>
<td>20 843 170</td>
</tr>
<tr>
<td>Extra-region</td>
<td>1 332.3</td>
<td>-</td>
</tr>
</tbody>
</table>

In the Italian healthcare sector, the public and the private sector are strongly interrelated. Italy is experiencing a gradual unification of public sector healthcare

\(^1\) Diagnosis-Related Group
organisations, comprising 121 local health districts, 71 public acute care hospitals, and 38 hospital hubs (mostly in the North of Italy, and in the metropolitan area of Rome and Milan). In Italy, in 2015, the healthcare sector’s total expenditure was 149 billion euros, with 42 billion euros coming from the private for-profit and not-for-profit sector (almost 30% of the total expenditure). Within Italy, almost 70 per cent of hospital beds are provided by public sector hospitals, while the remaining 30 per cent is provided by private for-profit and not-for-profit hospitals, all generally accredited within their own Regional System. Private for-profit and non-profit organisations provide 26 per cent of the services within the National Healthcare Service (CERGAS-Bocconi 2016). The situation is similar in the Lombardy region, where the first step of this research was carried out.

4.6.2.2 The research panel, survey submission process and data analysis of premise of the research

The premise of the research is the assessment of the low reliability, using Italian hospitals’ data, of the US’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture (HSPOSC) (Nieva & Sorra 2003). Survey data was collected in 2013 from all clinical staff working in three public and one private acute care hospitals in the North of Italy. The sample captured the total staff population of the chosen acute care hospitals. Data was collected using a survey-based, self-report strategy (Ghauri & Grønhaug 2002). After involving the hospitals’ quality managers, surveys and the survey’s rationale were sent by email to staff, supported by a note explaining the research and confirming the anonymity. Data for this step of the research was collected from 911 staff - Registered Nurses (N=369), Physicians (N=226), Health Technicians (N=141), Biologists (N=55), Enrolled Nurses (N=58), Administrative staff (N=49), Physiotherapists (N=6), Pharmacists (N=5), Dieticians (N=2). A test of common method bias was conducted using Harman’s Single Factor Test (Harman 1976). It requires to perform an exploratory factor
analysis on all the model’s items, assuming that the presence of a single factor accounting for the majority of covariance among variables implies the presence of CMV (Podsakoff et al. 2003). In the model, each item explained less than 28% of the variance, which suggests a low possibility of common method bias (Harman 1976).

4.6.2.3 The research panel, survey submission process and data analysis of the first step of the research

The first step of the research investigates how LMX and engagement affect the situational, psychological, and behavioural aspects of safety culture. Survey data was collected in March 2015 from all clinical staff working in one of the best-known Italian private acute care hospitals in the North of Italy. The sample comprised the total clinical staff population of the chosen acute care hospital. Data were collected using a survey-based, self-report strategy (Ghauri & Grønhaug 2002). After involving the hospital’s clinical risk manager, the HR manager, the health profession’s hospital director, surveys and the survey’s rationale were sent to clinical staff by email, supported by a note explaining the research and confirming the anonymity. Data was collected using the Qualtrics’s surveys online platform (http://www.qualtrics.com). Data for this step of the research was collected from 648 clinical employees working in one Italian acute care hospital (redemption rate 42%). The survey was administered online to 1,523 clinical staff and, of the 712 surveys submitted, 9% were not fully completed, and these entries were deleted. Of 648 clinical staff, 250 were registered nurses, 226 were doctors, 54 were healthcare staff such as biologists, dieticians, pharmacists, psychologists, 38 were health technicians, and 80 were nursing assistants. The sample comprised 421 females and 227 males, of whom 96 (14.8%) had been in the job for less than three years, 101 (15.6%) had been in the job for between three and six years, 143 (22.1%) had been in the job for between six and ten years, 186 (28.7%) had been in the job between ten and fifteen years and 122 (18.8%) had been in the job more than fifteen years.
Quantitative data has been analysed using Structural Equation Modelling (IBM SPSS Amos Version 22 Software). In broad terms, Structural Equation Modelling (SEM) employs regression, path, and confirmatory factor models to explain variables’ and constructs’ interactions, to verifying quantitatively the reliability of a theoretical model (Schumacker & Lomax 2010).

As the analysis utilised higher-order constructs in the final model, reliability and model fit was assessed in the lower-order structure model, higher-order structure model, and in the final measurement model. The model fit for the lower-order model was good. The CMIN was over degrees of freedom (CMIN/DF) at 2.263, with an acceptable range for this statistic between 2.0 and 5.0 (Tabachnick & Fidell 2007; Wheaton et al. 1977). The goodness of fit index (GFI) was at .921, acceptable over .9 (Hooper, Coughlan & Mullen 2008), the comparative fit index (CFI) at .974, acceptable over .9 (Bentler 1990), and RMSEA at .044, acceptable under .08, good under .05 (Hooper, Coughlan & Mullen 2008).

Similarly, the higher-order model was equally acceptable, with CMIN/DF at 2.293, GFI at .919, CFI and .973 and RMSEA at .045. The final, measure model was acceptable with CMIN/DF at 2.230, GFI at .915, CFI at .970 and RMSEA at .044. Common methods variance was examined using Harman’s Single Factor Test. One factor was explained by 32% of the variance, indicating that there is a low chance of common method bias (Harman 1976).

4.6.2.4 The research panel, survey submission process and data analysis of the second step of the research

The second step of the research investigates how Safety LMX and PsyCap affect accreditation culture as a second order variable (comprising situational, psychological and behavioural components variables) and safety culture as a second order variable (comprising situational, psychological and behavioural components variables). Data (N=1125) was
collected in 2015 from doctors working in Italian public and private not-for-profit hospitals, using a survey-based, self-report strategy (Ghauri & Grønhaug 2002). After involving the scientific board of most Italian medical scientific societies through the Italian Federation of Medical-Scientific Societies (FISM), electronic surveys were sent to associated doctors by email, supported by a note explaining the research and confirming the anonymity. The sample was the total population of associated doctors. The electronic surveys, and the note explaining the research and confirming the anonymity, were sent using Qualtrics’ surveys online platform (http://www.qualtrics.com).

Again, quantitative data was analysed using Structural Equation Modelling (IBM SPSS Amos Version 22 Software). To develop and validate the new measure (i.e. accreditation culture), and undertake confirmatory factor analysis to ensure the reliability of all measures used in the analysis, the reliability assessment framework of Hinkin (1998) and Ping (2004) was used. Once a valid model with the total sample was delivered, a cross-validation process was undertaken, as advocated by Hair et al. (2010), and the reliability of all measures remained constant (i.e. above the required .7, and within .10 of the reliability score for the larger sample size). Three control variables were used: gender, role, and organisation. Of the sample, 30.4% were female and 69.6% were male. 28.5% were doctors with a professional role (clinicians), 26.9% were doctors with some managerial responsibilities, and 44.6% were doctors directing hospital units or departments. Of the sample, 54.7% worked in public hospitals, 7.9% worked in private (accredited) hospitals, 3.9% worked in public research hospitals, 3.0% worked in private research hospitals, 26.1% worked in local health authorities (which are public). Analysis yielded that the organisation where the person was employed had a very small but significant effect on their safety culture (.021*).

To ensure the data was completed with consideration by the participants, a common
methods variance test using Harman’s Single Factor Test was undertaken. One factor explained 23.1% of the variance, indicating that there is a low chance of common method bias. The higher-order measurement model used in the analysis had acceptable fit, with CMIN/DF at 2.293 (acceptable under 5), CFI at .973 (acceptable over .9) and RMSEA at .045. The final measurement model was acceptable with CMIN/DF at 2.640, CFI at .955 and RMSEA at .038 (acceptable under .08, good under .05).

4.7 Summary

This research uses a cross-sectional design to gather data from healthcare professionals in Italian acute care hospitals to operationalise and test a new comprehensive model of safety culture within healthcare organisations. In particular, the study tests whether SET factors (LMX, Safety LMX, Engagement) and POB factors (PsyCap) predict accreditation and safety culture in a causal chain. For the purpose of this thesis, the postpositive paradigm has been chosen, and, as a strategy of inquiry, a quantitative method design has been selected. The research method chosen to collect quantitative data from a large sample of staff from acute care hospitals on the variables to be assessed to investigate the research questions is the survey method. Data will be collected using a survey-based, self-report strategy. The study uses a positivist methodological approach to empirically test a model using Structural Equation Modelling (IBM SPSS Amos Version 22 Software).
5. The premise of the research

The premise of the research was presented in 2015 at the 75th Annual Meeting of the Academy of Management as “Trinchero E., Farr-Wharton B., Psychometric Properties Of The Hospital Survey On Patient Safety Culture: Italian Findings” (see Appendix 9.8) and is currently under review in Safety Science as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. How Safe is Safety Culture Analysis? A qualitative review of previous analyses of Hospital Surveys on Patient Safety Culture (HSPOSC), and a best practice template for future replication using Italian data.” Chapter 5. is redacted. Currently under review for publication.
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Chapter 5. is redacted. Currently under review for publication.
Chapter 5. is redacted. Currently under review for publication.
Chapter 5 is redacted. Currently under review for publication.
6. The first part of the research

The first step of the research was presented in 2016 at the 76th Annual Meeting of the Academy of Management as “Trinchero E., A Social Exchange Perspective For Achieving Safety Culture In Healthcare Organizations” (see Appendix 9.9), and it is currently under review (minor revision status) in the *International Journal of Public Sector Management* as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. A Social Exchange Perspective for Achieving Safety Culture in Healthcare Organizations.” The paper currently under review (minor revision) is presented in its original design in the following pages.

6.1 Abstract

Using Social Exchange Theory and Cooper’s (2000) model, this paper operationalizes a comprehensive model of safety culture and tests whether SET factors (supervisor-employee relationships and engagement) predict safety culture in a causal chain. The model was tested using surveys from 648 healthcare staff in an Italian acute care hospital and analysed using Structural Equation Modelling. Safety behaviours of clinical staff can be explained by the quality of the supervisor-employee relationship, their engagement, their feelings about safety and the quality of organizational support. The model provides a roadmap for strategically embedding effective safe behaviours. Management needs to improve healthcare staff’s workplace relationships to enhance engagement and to shape beliefs about safety practices. The contribution of this paper is that it has empirically developed and tested a comprehensive model of safety culture that identifies a causal chain for healthcare managers to follow so as to embed an effective safety culture.

6.2 Introduction

The cost of patient and employee safety breaches continues to be a problem for
healthcare organizations’ managers, who are concerned with addressing those safety culture issues that increase the potential for patient morbidity and mortality (Colla et al. 2005). The safety culture of an organization has been defined as “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization’s health and safety management” (ACSNI 1993, p. 23).

Unlike other high-reliability organizations (HROs) (such as the nuclear or aviation industries) that monitor safety by rigorous process planning, healthcare organizations use a patient-centred model, which is far harder to control because humans are less predictable than capital equipment (Resar 2006). Additionally, workloads are high in many healthcare organizations, which potentially can compromise patient safety irrespective of the quality of organizational safety processes in place (Abdelhadi and Drach-Zahavy 2012). Hence, the World Health Organization (WHO) is driving a global initiative aimed at reducing workplace and patient accidents (www.who.int/patient-safety), that need to be embedded in a strong safety culture within a holistic organizational approach (Singer and Vogus 2013).

The assumption is that, if a positive safety culture can be embedded, then the result will be a significant reduction in errors and accidents (Sorra and Nieva 2004). Although the relevance of safety culture for high-risk organizations is increasingly becoming evident, at the turn of the twenty-first century Guldenmund (2000, p. 216) argued that “the concept still has not advanced beyond its first developmental stages” and a decade later, the situation had still not changed much (Vogus et al. 2010). There are numerous reasons. One problem is terminology. For example, there is literature debating the similarities and differences between safety climate and safety culture (i.e. Choudhry et al. 2007, Cole et al. 2013, Flin 2007, Zohar and Polachek 2014). Safety climate is defined by Zohar (1980) as moral perceptions that workers share regarding their working environment. As such, safety climate is a measurable
component of safety culture, comprising management behaviour, safety systems, and overall employee perceptions of safety (Kuenzi and Schminke 2009).

A second issue in adequately capturing the safety culture within healthcare organizations is the lack of comprehensive empirically tested models to assess cost-effectively hospitals’ safety culture, starting from past research that has identified some of the relevant variables and potential relationships (e.g., El-Jardali et al. 2011, Kline et al. 2008, Vogus et al. 2010, Yates et al. 2004). Although in other sectors past research has analysed how safety culture affects safety performance (e.g., Molenaar et al. 2009), it seems to be a need to develop new models and to empirically test established models to determine their usefulness in measuring safety culture in healthcare organizations.

In this paper, to capture the complexity of the dimensions involved in achieving a safe working culture, a comprehensive predictive model is developed and tested using two theoretical frameworks - Social Exchange Theory (SET) and Cooper’s model of organizational safety culture. SET is the framework used to conceptualize how workplace relationships (Leader-Member-Exchange –LMX- and employee engagement) impact safety culture, due to its potential to explain most staff practices in the workplace (Cropanzano and Mitchell 2005). Cooper’s (2000) model of safety culture is the framework used to conceptualize the ACSNI’s (1993) safety culture definition, due to its foundation on the concept of reciprocal determinism (Bandura 1986), offering a reliable pathway to deliver measurable constructs.

The research question guiding the study is:

*RQ1: What are the impacts of SET factors - LMX and employee engagement - on the psychological, behavioural and situational aspects of safety culture?*

This comprehensive model of safety culture is tested within healthcare settings in Italy, examining the safety culture of clinical staff and employing Structural Equation Modelling.
(SEM) to ensure robust empirical testing of the data and an evidence-based useable model for healthcare managers.

**Applying Social Exchange Theory to safety culture**

SET assumes that there are tangible and intangible positive benefits and outcomes for all stakeholders from effective workplace relationships (Cropanzano and Mitchell 2005). In theory, effective social interactions between management/supervisors and employees build trust and positive socio-emotional feelings that in turn result in mutually beneficial reciprocity in behaviours. Employees benefit from the extra resources, information, autonomy and respect given to them by management; managers benefit because of the support they receive from employees for their decision-making, and the organization benefits from increased efficiency and effectiveness resulting from high levels of co-operation amongst colleagues (Shore et al. 2011). Two SET variables are included in the comprehensive model proposed in the paper: Leader-Member-Exchange (LMX) and employee engagement.

**Leader-Member-Exchange**

Positive leader-member relationships involve reciprocal trust, friendship, and respect (Uhl-Bien and Maslyn 2003), and within an organization can gradually build a profitable working environment for all the stakeholders (Scandura and Pellegrini 2008). Moreover, a productive leader-member relationships is embedded in a just performance management style of leadership (Dulebohn et al. 2012, p. 1744). Focusing on safety performance, several studies have analysed the impact of leader-member relationships on employees’ safety outcomes (Hofmann et al. 2003, Mearns and Reader 2008, Michael et al. 2006). Precisely, leader-member relationships positively affect safety citizenship role definitions in a positive safety climate (Hofmann et al. 2003), and influence staff’s proactive safe behaviours - for example supporting co-workers and reporting hazards (Mearns and Reader 2008). Moreover, LMX affect safety-related events more than safety communication (Michael et al. 2006).
Finally, Fernandez-Muniz et al. (2007) have analysed how leaders commitment to safety improves safe behaviours.

However, while previous research has identified the important role that individual SET factors play in affecting different aspects of safety culture, no comprehensive predictive model has been developed. On the other hand, it seems likely that a SET framework could contribute significantly to building a better understanding of safety culture; however, the link between the quality of workplace relationships and safety outcomes remains relatively unexplored (Vogus et al. 2010).

**Employee engagement**

There is increasing evidence that engaged employees are desirable for organizations because they work hard and enthusiastically on the job, and in a meaningful way (Macey et al. 2009, Slåtten and Mehmetoglu 2011). It is management’s responsibility to inform, educate, train and performance-manage employees about organizational priorities and procedures as well as organizational expectations of performance and behaviours: as a consequence, a strong predictor of engagement is LMX (Brunetto et al. 2014). We expect to replicate this finding in this study. SET researchers conceptualize employee engagement as a function of workplace relationships (Brunetto et al. 2014, May et al. 2004), whereas other researchers (mainly from the psychology discipline) conceptualize burnout of employees at the opposite end of a continuum to engagement. Using a psychological theoretical perspective, Nahrgang et al. (2011) have identified that high job demand (involving high risks and hazards, physical demands, and complexity) is inversely linked to engagement and directly linked to burnout. Whereas, a high level of job resources (knowledge, autonomy, supportive environment: social support, leadership, safety climate) is positively linked to engagement and negatively linked to burnout. Additionally, they also have found that burnout is associated with workplace accidents, employees’ injuries, adverse events, and unsafe
behaviour. Also, Vinodkumar and Bhasi (2010) in their research have found that safety knowledge and safety motivation mediate the impact of safety training and that high management commitment is associated with high employee safety compliance, and high employee involvement increases their participation in safety activities.

**Coopers’ model of safety culture**

The definition of safety culture provided by the Advisory Committee on the Safety of Nuclear Installations (1993) has been conceptualized using Cooper's (2000) model of safety culture. Cooper’s (2000) model of safety culture argues that safety culture involves a situational, a psychological, and a behavioural category of factors. Those factors are part of safety culture. Precisely, the situational dimension of safety culture refers to the organization’s policies, guidelines, procedures safety-related, the psychological dimension of safety culture refers to the staff attitudes about the relevance of safety, and the behavioural aspect refers to the safety-related behaviours of the employees. Cooper (2000) states that in combination, the three dimensions provide a means of measuring and benchmarking safety culture across industries. This paper operationalizes Cooper’s (2000) model of safety culture as part of a comprehensive model of safety culture for healthcare organizations.

To address the situational dimension of safety culture, the research followed Meyer et al. (1993), and DeJoy et al. (2004) who stated that organization’s goals and priorities were readable through the commitment to employee training. Also, Nieva and Sorra (2003) and Katz-Navon et al. (2005) underlined the relationship between employees’ opinions on safety procedures, safety training, and safety outcome. This means that employee attitudes and behaviour result from management policies, procedures and funding for safety training in line with previous research findings (e.g., DeJoy et al. 2004). These results endorse the choice of safety procedures and safety training to assess the situational dimension of safety culture, as the base on which behavioural and psychological safety culture dimensions can be developed.
To address the psychological dimension of safety culture, the research followed Katz-Navon et al. (2005), who studied the relevance of safety priority on employees’ behaviours. A leader-member consistent perception of the priority of safety affects employees’ behaviours (Katz-Navon et al. 2005, Katz-Navon et al. 2009, Zohar 2002). The priority of safety affects safety performance because it impacts on the amount of resources safety committed and on the doctors’ role conflict (Katz-Navon et al. 2009). A low perception of safety priority leads employees to consider safety procedures as redundant, bureaucratic (red tape) and ignorable (Falbruch and Wilpert 1999).

To address the behavioural aspect of safety culture, the research followed Neal and Griffith (2006), who studied the impact of organization expected and rewarded safety practices on employees’ safety behaviour, using safety compliance behaviour (Neal and Griffin 2006), which assess healthcare staff adherence to safety required behaviour, and in-role safety performance (Williams and Anderson 1991), which assess healthcare staff perceptions to meet organization’s required in-role safety performance. The study explores in a healthcare setting if the psychological dimension of safety culture predicts the behavioural dimension of safety culture following previous researchers arguing that safety priorities significantly impact employees’ safety behaviour (e.g., Choudhry et al. 2007; Katz-Navon et al. 2005).

The missing ingredient from past models has been the interaction of SET factors and Cooper’s (2000) safety culture dimensions. The following hypotheses capture the paths from SET factors to safety culture factors.

H1. High LMX is associated with high employee engagement
H2. High LMX is associated with high situational safety culture
H3: High LMX is associated with high psychological safety culture
H4: High LMX is associated with high behavioural safety culture
H5. High employee engagement is associated with high situational safety culture
H6: High employee engagement is associated with high psychological safety culture
H7: High employee engagement is associated with high behavioural safety culture
H8: High situational safety culture is associated with high psychological safety culture.
H9: High situational safety culture is associated with high behavioural safety culture.
H10: High psychological safety culture is associated with high behavioural safety culture.

These hypotheses are tested using Structural Equation Modelling (IBM SPSS Amos version 22 software), as discussed in the next section.

6.3 Methods

Following a positivist approach, the research tests the model through Structural Equation Modelling (SEM). The emerging patterns of data were then compared with the findings of previous research.

Sampling

Data for this study (N. 648) were collected using a survey-based, self-report strategy (Ghauri and Grønhaug 2002) during 2015, from clinical employees working in one Italian acute care hospital. The survey and the survey rationale were sent to the hospital risk manager with a cover note explaining the research and confirming the anonymity of the participants. Then, the surveys were administered online by the researchers, sending via email an anonym link to the survey to 1,523 clinical staff. Clinical staff had 20 days to submit the survey. Of the 712 surveys submitted, 9% were not fully completed, and these entries were deleted (redemption rate 42%). Ethical approval obtained from the Australian Human Research Ethics Committee (no. ECN 13-113).

Instruments

In most cases, shortened versions of pre-validated scales were used in the administered
survey at the request of the partner organization (hospital) that had concerns about the overall length. To develop valid, shortened scales, a pilot survey was administered to 44 staff, and an initial exploratory factor analysis was undertaken. Items that did not load onto their appropriate factor, or had a correlation coefficient that was below .4 were removed through this process (in most cases, this included reverse scored items (which did not load appropriately when inverted), and items with questionable face validity for the healthcare context at hand (for example, the employee engagement item – ‘When I get up in the morning, I feel like going to work’ is not a sentiment shared by many nurses who work night shifts). The deleted items are noted in the appendix, along with the factor loads of the remaining questions. The resulting scales were presented using statements to be rated on a 6-point Likert-type scale, with 1 = strongly disagree, ranging to 6 = strongly agree.

Satisfaction with the quality of the supervisor-employee relationship was measured using the 7-item uni-dimensional scale (LMX-7), developed by Graen and Uhl-Bien (1995). The first item of this scale was removed to enhance overall model fit, leaving a composite reliability coefficient of .95 (acceptable above .7) and an average variance estimate of .76 (acceptable when above .5) (Hair et al. 2017). The engagement was measured using a shortened four-item scale from Schaufeli and Bakker (2003) original nines item. The reduced scale has strong internal reliability as indicated by the composite reliability coefficient of .88 and an average variance estimate of .65. The situational component of safety culture was captured by three of four-item Katz-Navon et al. (2005) safety procedures scale adapted from Brunsson and Jacobsson (2000) and employee’s satisfaction with (safety) training (Meyer et al. 1993). As a higher-order variable, the combined scale has reasonable internal reliability as indicated by the composite reliability coefficient of .77 and an average variance estimate of .62. The psychological component of safety culture was captured by four of seven-item of Katz-Navon et al. (2005) priority of safety scale adapted from (Zohar 2000). The scale has
reasonable internal reliability as indicated by the composite reliability coefficient of .92 and an average variance estimate of .74. The behavioural component of safety culture was captured using a high-order factor that combined safety compliance scale (Neal and Griffin 2006) and in-role (safety) performance (Brunetto et al. 2016). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .93 and an average variance estimate of .87. The items and reliabilities per construct, that were derived through the confirmatory factor analysis (structural equation modelling process) are attached in the appendix (see Appendix 6-1).

Analysis

Data were inputted into the SPSS 24 software package. A missing values analysis was conducted to examine the proportion of missing values on each item. The analysis indicated that no more than 6% of data was missing for each item, and where data was missing, the mean was imputed in line with the recommendation of Hair et al. (2010). The distribution of each item was examined using a manual scanning of Q-Q plots, as well as the skewness and kurtosis statistics. All items presented as having parametric properties, with only slight deviations from normality, and skewness and kurtosis within acceptable thresholds (-2 and +2), in line with the recommendations of Field (2013). To examine the potential for common method variance impacting the data, Harman’s single factor test was applied. The test indicated that only 32% of the variance could be explained by one factor, and as a result, the chance for common method variance impacting the data is low. As the review of the data yielded robust results, a preliminary exploratory factor analysis (EFA) was conducted (principal axis factoring with varimax rotation, with small coefficients suppressed under a .4 threshold). The EFA identified that the dependent measures – “in-role safety performance” and “safety compliance” – loaded into one factor and that the measures for – ‘safety training’ and ‘safety procedures’ also formed one variable, commensurate with the concept of
situational aspects of safety culture. Using this factor pattern, a confirmatory factor analysis (measurement) model was assembled in the AMOS software package.

As the analysis utilized higher-order constructs in the final model, reliability and model fit was assessed in the lower-order structure model, higher-order structure model, and in the final measurement model. The model fit for the lower-order model was good, with the CMIN over degrees of freedom (CMIN/DF) at 2.263 (acceptable under 5), the goodness of fit (GFI) index at .921 (acceptable over .9), the corrected fit index (CFI) at .974 (acceptable over .9), and RMSEA at .044 (good under .05, acceptable under .08). Similarly, the higher-order model was equally acceptable, with CMIN/DF at 2.293, GFI at .919, CFI and .973 and RMSEA at .045. The final, model was acceptable with CMIN/DF at 2.230, GFI at .915, CFI at .970 and RMSEA at .044. The analysis included observations of both the direct (hypothesized) paths, and the indirect (mediating) paths that bridge connections between each variable. Mediation testing utilised the bootstrapped bias corrected standardised indirect effect test (undertaken at the 95% confidence level, bootstrapped to 4000 samples), as prescribed by Shrout and Bolger (2002).

6.4 Results

Of 648 clinical staff who responded to the survey, 250 were registered nurses, 226 were doctors, 80 were nursing assistants, 54 were healthcare staff such as biologists, dieticians, pharmacists, psychologists, and 38 were health technicians. The sample comprised 421 females and 227 males, of which 96 (14.8%) had been in the job for less than three years, 101 (15.6%) had been in the job for between three and six years, 143 (22.1%) had been in the job for between six and ten years, 186 (28.7%) had been in the job between ten and fifteen years and 122 (18.8%) had been in the job more than fifteen years. A descriptive (mean and standard deviation) and correlation table is provided in the appendix (see Appendix 6-2).

This paper used SET and Cooper’s model to operationalize and test a new
comprehensive model of safety culture. In particular, the study tested and found that SET factors (LMX and employee engagement) were significantly associated with the safety culture components in a step-wise chain. The results, which highlight the direct and indirect estimates, together with the significance levels, are displayed in Table 6-1.

Table 5-1 – Direct, indirect and total effects relationship

<table>
<thead>
<tr>
<th>Direct, indirect and total effects relationship</th>
<th>Direct Effects</th>
<th>Indirect Effects</th>
<th>Total Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMX -&gt; Employee Engagement</td>
<td>.38***</td>
<td>-</td>
<td>.</td>
</tr>
<tr>
<td>LMX -&gt; Safety Culture: Situational Aspects</td>
<td>.22***</td>
<td>.12***</td>
<td>.33***</td>
</tr>
<tr>
<td>LMX -&gt; Safety Culture: Psychological Aspects</td>
<td>.32***</td>
<td>.09**</td>
<td>.41**</td>
</tr>
<tr>
<td>LMX -&gt; Safety Cultural: Behavioural Aspects</td>
<td>-.11*</td>
<td>.37***</td>
<td>.28***</td>
</tr>
<tr>
<td>Engagement -&gt; Safety Culture: Situational Aspects</td>
<td>.50***</td>
<td>-</td>
<td>.50***</td>
</tr>
<tr>
<td>Engagement -&gt; Safety Culture: Psychological Aspects</td>
<td>-</td>
<td>.06*</td>
<td>.06*</td>
</tr>
<tr>
<td>Engagement -&gt; Safety Cultural: Behavioural Aspects</td>
<td>.13*</td>
<td>.30***</td>
<td>.43*</td>
</tr>
<tr>
<td>Safety Culture: Situational Aspects-&gt; Safety Culture: Psychological Aspects</td>
<td>.13*</td>
<td>-</td>
<td>.13*</td>
</tr>
<tr>
<td>Safety Culture: Situational Aspects-&gt; Safety Culture: Behavioural Aspects</td>
<td>.50**</td>
<td>.03*</td>
<td>.53*</td>
</tr>
<tr>
<td>Safety Culture: Psychological Aspects-&gt; Safety Cultural: Behavioural Aspects</td>
<td>.27***</td>
<td>-</td>
<td>.27***</td>
</tr>
<tr>
<td>Control: Gender-&gt; Safety Cultural: Behavioural Aspects</td>
<td>-.01 N.S.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Control: Gender-&gt; Experience</td>
<td>-.02 N.S.</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

***p < 0.001, **p < 0.01, *p < 0.05. n = 648. Total Effects = Direct Effects (standardized estimate and p value) + Indirect Effects (standardized estimate and p value). Indirect confidence interval (p value) is determined through Two Tailed Bias Corrected (95% confidence) percentile method bootstrapped to 4000 samples. The hyphen represents an insignificant path. N.S. = not significant.

The findings indicate that all hypotheses are supported. Positive associations were shown between all tested constructs, thought the total effect linking situational aspects and behavioural aspects of safety culture was low (β=.13, p<.05). Although the direct effect between LMX and the behavioural aspects of safety culture is negative (β=-.11, p<.05), the total effect is positive, but the pervading positive effect occurs through the mediated paths. A strong association was shown for the relationships between situational aspects and psychological aspects of safety culture - (β.53, p<.05), between employee engagement and the situational aspects of safety culture (β=.50, p<.001), and between LMX and the
psychological aspects of safety culture ($\beta=.41$, $p<.01$).

There are two important numerical values evident in Figure 6-1. The R-squared ($r^2$) value explains how much of the variance of the dependent variable is explained by the independent variables. For example, the $r^2=.15$ means that the quality of LMX explains approximately one seventh of employees’ engagement. On the other hand, if a statistically significant relationship exists between two variables, then this is indicated by the level of significance, following the $p$ value. For example $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$ indicates increasing levels of significance, whereas if a $p$ level is listed without any significance, it means that there is no significant relationship between the variables.

As noted in Figure 6-1, the modelled constructs explained 46% of the variance of safety
culture: behavioural aspects, 21% of psychological aspects, and 38% of situational aspects. As a result, the study finds support for a step-wise chain of safety culture, and the significant influence of LMX and employee engagement on this. Moreover, the significant relationship between LMX and the corresponding safety culture constructs provide evidence that effective workplace relationships are a platform on which safety structures and processes are embedded. It should be noted that the slight majority of variance for the safety culture: behavioural aspects construct, and the majority of the variance for the other constructs (psychological aspects and situational aspects) are not accounted for in this model. This suggests that other constructs (likely a combination of individual and organizational), untested in this analysis, have an influence on safety culture. Researchers have had a poor history of comprehensively empirically capturing and testing safety culture in a step-wise chain. However, this research is only possible because of the growing body of studies that have attempted to test individual aspects of safety climate and culture. In particular, using an SET framework, this paper builds on the work of Hofmann et al. (2003), Mearns and Reader (2008), Michael et al. (2006) and Vogus et al. (2010) in relation to LMX, and Nahrgang et al. (2007) and Vinodkumar and Bhasi (2010) in relation to employee engagement.

Additionally, this paper builds on Cooper's model of safety culture, which in turn rests on a body of research focusing on either the psychological dimension (Choudhry et al. 2007; Katz-Navon et al. 2005) or the situational dimension (DeJoy et al. 2004, Zohar 2010) and/or the behavioural dimension (Neal and Griffin 2006). Hence, the first contribution of this paper is that it has empirically developed and tested a comprehensive model of safety culture that identifies a causal chain for healthcare managers to follow so as to embed an effective safety culture.

The second contribution of this paper is in developing/modifying existing instruments to adequately capture the concepts identified in previous safety research. In particular, the
situational component of safety culture was obtained by combining and testing a reduced scales form of Katz-Navon et al. (2005) formal safety procedures scale and employee’s satisfaction with safety training (Meyer et al. 1993); the psychological component of safety culture was obtained by modifying an existing measure of priority of safety (Katz-Navon et al. 2005) and the behavioural component of safety culture was obtained by testing and modifying a reduced scale from safety compliance (Neal and Griffin 2006) and the in-role safety performance instrument (Brunetto et al. 2016). These instruments were used to firstly develop higher order factors, which were then robustly tested using SEM.

Limitation

First, self-report surveys can cause common method bias, although, Spector et al. (2004) argue that the self-reporting method is legitimate for gathering data about employees’ perceptions, as long as the instrument reflects a comprehensive review of literature and pattern-matching is used to support the interpretation of the data. Also, as stated, Harman’s ex-post one-factor test was used to determine if there was a common method bias (Podsakoff et al. 2003, Podsakoff and Organ 1986) and in this case one factor explained 32% of the variance, suggesting a low chance of common method bias. Second, while Cooper (2000) suggests a triangulation in data collection, using measures like peer observations, outcome measures, audits, self-report measures or questionnaires, the proposed model uses a self-reported questionnaire to address and measure all aspects of Cooper’s safety culture model. The authors’ approach relies on the willingness to find a model that guarantees comparability of the results among organizations, and the feasibility of the approach. In fact, as Glendon and Stanton (2000, p. 212) well stated, “ethnographic approaches, while possibly the most valid from an interpretive perspective, are often costly and time-consuming.” Third, only the 42% of the hospital entire clinical population answers the survey, as this causal model has been tested in one country, and in one single organization, it needs to be tested in other
organizations and countries to confirm its generalizability. Finally, a further limitation is that in this study “leadership” has been captured in the form of the direct supervisor. Future studies should consider including the role of senior leadership so as to better understand the extent to which their ‘buy-in’ affects healthcare professionals’ safe behaviour.

6.5 Implications

Top managers of healthcare organizations face a conflict between competing goals (safety outcomes - which are initially resource intensive - versus high profits/cost reduction), and have to make choices about the extent to which they resource both compliance with safety procedures whilst still wanting employees to report and learn from mistakes or pay rising malpractice claims (Bonetti et al. 2016). The findings from this paper provide healthcare managers with an empirically robust model for examining safety culture within healthcare organizations. The model also provides a roadmap for strategically embedding effective safe behaviours. The roadmap identifies that effective workplace relationships between supervisors and healthcare professionals are the platform on which on all other safety structures and processes are embedded. This means that simply overlaying official safety processes on top of poor workplace relationships between supervisors and employees is unlikely to be successful because supervisors do more than manage; they also role model appropriate safety behaviour and fill in the vital non-verbal clues as to the importance of safety to the organization. Based on a mixture of these tangible and intangible messages, employees either engage in a productive and energetic manner or slowly dis-engage over time (Brunetto et al. 2014). Simply ensuring the situational dimension of safety culture (official safety procedures and training) is not enough. It requires the combined impact of an effective LMX, which in turn promotes engaged professionals in addition to official safety procedures and training (situational dimension of safety culture) and official managerial safety priorities (psychological dimension of safety culture) to promote appropriate safety behaviour.
(behavioural dimension of safety culture) necessary to significantly reduce patient and employee safety breaches that presently compromise patient morbidity and mortality. The evidence shows that embedding an effective LMX lays the foundations for engaging employees, and promoting the situational and psychological dimensions of safety culture, which in turn explains almost half of employee safety behaviours in healthcare organizations. Hence, if hospitals’ managers follow this roadmap, they will be in a position to ensure safe behaviours of their professional staff. Future research could possibly use ethnographic approaches to further explore the behavioural aspect of safety culture, using observational data.
## Appendix 6-1 – Factor loading per item

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LMX</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I have enough confidence in my supervisor that I would defend and justify his / her decisions if he /she were not present to do so</td>
<td>.904</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>My supervisor recognizes my potential</td>
<td>.898</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>My supervisor would be willing to help in her/his own time</td>
<td>.890</td>
<td></td>
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<tr>
<td>My supervisor understands my work problems and needs</td>
<td>.867</td>
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<tr>
<td>I have a good working relationship with my supervisor</td>
<td>.845</td>
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<tr>
<td>My supervisor is willing to use her/his power to help me to solve work problems</td>
<td>.821</td>
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<tr>
<td><strong>Employee Engagement</strong></td>
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<tr>
<td>I am proud of the work that I do</td>
<td>.888</td>
<td></td>
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<tr>
<td>I am immersed in my work</td>
<td>.840</td>
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<tr>
<td>I feel happy when I am working intensely</td>
<td>.822</td>
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<tr>
<td>I persevere, even when things do not go well</td>
<td>.688</td>
<td></td>
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<td></td>
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<tr>
<td>At my work, I feel bursting with energy</td>
<td>E</td>
<td></td>
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<tr>
<td>I find the work that I do full of meaning and purpose</td>
<td>E</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Time flies when I’m working</td>
<td>E</td>
<td></td>
<td></td>
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<tr>
<td>When I get up in the morning, I feel like going to work</td>
<td>E</td>
<td></td>
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<td></td>
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<tr>
<td>I am enthusiastic about my job</td>
<td>E</td>
<td></td>
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<tr>
<td><strong>Safety Culture: Situation Aspect</strong></td>
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<td>Safety Training</td>
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<tr>
<td>I am happy with the training opportunities provided for me in this hospital on patient safety issues</td>
<td>.914</td>
<td></td>
<td></td>
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<tr>
<td>There are lots of training opportunities provided for me in this hospital on patient safety issues</td>
<td>.913</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>My hospital gives me lots of opportunities to develop my full potential</td>
<td>.895</td>
<td></td>
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<tr>
<td>The training on patient safety issues I have received so far has helped me to do my job more safely</td>
<td>.870</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hospital places the right amount of important on training patient safety issues</td>
<td>.826</td>
<td></td>
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<tr>
<td>I am satisfied with the training on patient safety issues I have received so far</td>
<td>E</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td><strong>Safety Procedures</strong></td>
<td></td>
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</tr>
<tr>
<td>In my unit, the safety procedures are detailed</td>
<td>.954</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>In my unit, the safety procedures are extensive</td>
<td>.940</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>In my unit, the safety procedures relate to all work-related issues</td>
<td>.898</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Safety Culture: Psychological Aspects</strong></td>
<td></td>
<td></td>
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<tr>
<td>Safety Priority*</td>
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<tr>
<td>In my unit, safety rules and procedures are ignored</td>
<td>.936</td>
<td></td>
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<tr>
<td>In my unit it doesn’t matter how the work is done as long as there are no accidents</td>
<td>.861</td>
<td></td>
<td></td>
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<tr>
<td>In my unit, ignoring safety is acceptable</td>
<td>.832</td>
<td></td>
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<tr>
<td>In my unit, whenever pressure builds up, the preference is to do the job as fast as possible, even if that means compromising on safety</td>
<td>.801</td>
<td></td>
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<tr>
<td>In my unit in order to get the work done, one must ignore some safety aspects</td>
<td>E</td>
<td></td>
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<tr>
<td>In my unit human resource shortage undermines safety standards</td>
<td>E</td>
<td></td>
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<tr>
<td>I am satisfied with the training on patient safety issues I have received so far</td>
<td>E</td>
<td></td>
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<tr>
<td><strong>Safety Culture: Behavioural Aspects</strong></td>
<td></td>
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<tr>
<td>In-role safety performance</td>
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<tr>
<td>I perform safety tasks that are expected</td>
<td>.928</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>I meet formal safety performance requirements of my job</td>
<td>.907</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>I complete my work tasks safely</td>
<td>.842</td>
<td></td>
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<tr>
<td>I fulfill safety responsibilities specified in my job description</td>
<td>.827</td>
<td></td>
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<tr>
<td><strong>Safety Compliance</strong></td>
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<tr>
<td>I ensure the highest levels of safety when I carry out my job</td>
<td>.910</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>I use all the necessary safety equipment to do my job</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>I use the correct safety procedures for carrying out my job</td>
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*Safety Priority was inverted in analysis
E: Excluded.
## Appendix 6-2 – Correlation Analysis

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<th>Mean</th>
<th>Standard deviation</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
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<td>1. LMX</td>
<td>4.4601</td>
<td>1.13801</td>
<td>1</td>
<td></td>
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<tr>
<td>2. Employee Engagement</td>
<td>4.5656</td>
<td>1.00221</td>
<td>.349***</td>
<td>1</td>
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<td>3. Situational Aspects</td>
<td>4.4634</td>
<td>.90562</td>
<td>.353***</td>
<td>.472***</td>
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<td>4. Psychological Aspects</td>
<td>4.7427</td>
<td>1.16298</td>
<td>.395***</td>
<td>.308***</td>
<td>.303***</td>
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<tr>
<td>5. Behavioural Aspects</td>
<td>5.1307</td>
<td>.64499</td>
<td>.240***</td>
<td>.429***</td>
<td>.511***</td>
<td>.406***</td>
<td>1</td>
<td></td>
<td></td>
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<td>6. Gender</td>
<td>1.35</td>
<td>.477</td>
<td>.057</td>
<td>.009</td>
<td>.016</td>
<td>.060</td>
<td>-.018</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>7. Experience</td>
<td>6.94</td>
<td>1.268</td>
<td>.091*</td>
<td>.050</td>
<td>.129**</td>
<td>.084*</td>
<td>.057</td>
<td>.044</td>
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</tr>
</tbody>
</table>

N=648, *p < 0.05, **p < 0.01, ***p < 0.001
7. The second part of the research


7.1 Abstract

This paper used Social Exchange Theory (SET), Positive Organizational Behavior (POB) and Cooper’s (2000) frameworks to operationalize a comprehensive model of safety culture, and tests whether one SET factor (supervisor-employee relationships) and one POB factor (psychological capital) predict accreditation and safety culture in a causal chain. Surveys from 1,125 Italian doctors were analyzed using Structural Equation Modeling. Supervisor-employee relationships and psychological capital accounted for two-fifths of the accreditation culture, and, in turn, explained more than half of the safety culture. Hence, effective workplace relationships between management and doctors provide a trusting foundation to develop safe practices for better healthcare.

7.2 Introduction

Patient safety is a major concern for healthcare organizations, and identifying the evidence-based predictors of safety culture is an important endeavour because quality care errors incur a high cost both in terms of patient morbidity and mortality (Resar, 2006, Flin, 2007). As van Dyck et al. (2005) well argue, a high-organizational error management culture, that comprise policies, procedures and shared practices, is crucial to moderate the errors’ adverse impacts and to increase the errors’ learning opportunities for the organization.
Moreover, their findings positively link organizational error management culture to organization performance (van Dyck et al., 2005). This approach relies on the organization ability to implement a comprehensive error reporting system to intercept the most of the adverse events. To increase the accidents’ reporting rate, a positive safety culture has to be developed among managers and staff, to challenge the organizations’ employees’ reward and recognition systems that tents to promote underreporting behaviours (Arezes and Miguel, 2003, Evans et al., 2006, Mahajan, 2010).

Moreover, especially within healthcare sector, “errors resist intervention because too often the interventions deployed fail to address the fundamental source of errors: weak organizational safety culture. (…) Isolated interventions are unlikely to reduce the underlying causes of hospital errors. (…) Instead, reducing errors requires systemic interventions that address the interrelated processes of safety culture in a balanced manner. (Singer and Vogus, 2013, p. 373).

While, in other industries, the relationships between the organization safety culture and safety performance has been already described, analysed, and quantified (Molenaar et al., 2009), in the healthcare sector there is a lack of empirically tested models and reliable instruments to assess safety culture (Trinchero and Farr - Wharton, 2015, Brunetto et al., 2016). A comprehensive, reliable, and cost effective model to assess hospitals’ safety culture, could be used to prove the impact of an healthcare organization’s safety culture on its patients’ outcomes (Yates et al., 2004, Kline et al., 2008, Huang et al., 2010, El-Jardali et al., 2011). Hence, the search continues for antecedents of safety culture across different theoretical frames.

Among the antecedents of an organization’ safety culture, the relevance of accreditation culture has become a worldwide issue. Accreditation could influence
organizational safety culture by socializing employees, and by underlining safety priorities (Teodoro and Hughes, 2012). Analysing attitudinal data from officers in six American police departments, Teodoro and Hughes (2012) find that accreditation is strongly correlated with officers’ perceptions of their agencies’ priorities. While the presence of a certain impact between an organization’s accreditation status and the safety and quality of the performance is widely recognized, there is a lack of empirical research on the value of the accreditation (Braithwaite et al., 2006, Teodoro and Hughes, 2012).

7.3 Purpose of inquiry

This paper addresses a void in the safety literature by using three theoretical frameworks – Social Exchange Theory (SET) (Blau, 1964), Positive Organizational Behaviour (POB) and Cooper’s (2000) conceptual safety framework – to operationalize and test a new comprehensive model for achieving accreditation and safety culture among healthcare organizations – and test whether the quality of leader-member exchange safety related (Safety LMX) and psychological capital predict accreditation and safety culture in a causal chain. Together they provide a comprehensive model that combines together the different inputs required to deliver safety outcomes.

SET has been used, since it provides a lens for understanding how workplace relationships impact on stakeholders’ outcomes (Cropanzano and Mitchell, 2005), such as safety (Hofmann et al., 2003). POB has been selected, since it provides a framework for examining the impact of individuals’ personal attributes on behaviours and outcomes (Luthans et al., 2007a), including safety outcomes (Eid et al., 2012). Together SET and POB variables provide a platform on which Cooper’s variables can be embedded. Cooper’s (2000) conceptual safety framework has been chosen for its ability to operationalize safety and accreditation culture, in order to develop an assessment tool. In combination, the
comprehensive model captures the complexity of what is required to improve safety outcomes.

Hence, the aim of the paper is to present a conceptual framework that investigates the extent to which the quality of workplace relationships between supervisors and employees (captured by measuring Safety LMX) and employee’s level of psychological capital affect the quality of accreditation culture and, in turn, impacts on the quality of safety culture within healthcare organizations.

The research questions guiding the study are:

RQ1: What is the impact of Safety LMX on accreditation culture?

RQ2: What is the impact of psychological capital on accreditation culture?

RQ3: What is the impact of accreditation culture on safety culture?

This comprehensive model for achieving both accreditation culture and safety culture is tested on doctors, working in Italian healthcare settings. Additionally, the study employs Structural Equation Modeling (SEM) to ensure robust empirical testing of the data and an evidence-based useable model for healthcare managers to use.

7.4 Literature review

The following three frameworks are needed to adequately capture the complexity of the safety issue. The value of this model is that it captures the three vital frameworks required to deliver safe outcomes: effective workplace relationships (delivered by SET), high PsyCap (delivered by POB) and finally the organisational accreditation and safety culture’s elements (delivered by Coopers’s model).
Theoretical framework 1: Social Exchange Theory (SET)

SET proposes that when one party creates an advantage for another party, an implicit obligation for forthcoming reciprocity is created (Gouldner, 1960, Blau, 1964). SET poses a framework that can explain most behaviours among employees (Cropanzano and Mitchell, 2005). Successful supervisor-employee relationships increase trust and constructive mindsets that lead to behaviours reciprocally useful (Shore et al., 2011). In the last years some scholars have used a social exchange framework to examine organizational safety issues (Hofmann and Morgeson, 1999, Hofmann et al., 2003, Michael et al., 2005, Michael et al., 2006, Mearns and Reader, 2008, Tucker et al., 2008, Didla et al., 2009, Kath et al., 2010, DeJoy et al., 2010) - but mostly not in the healthcare sector. The SET variable comprised in the model is safety leader-member exchange (Safety LMX).

Safety Leader-Member Exchange. A high quality LMX relationship can be conceptualized in terms of mutual trust, friendship and respect (Uhl-Bien and Maslyn, 2003). Such relationships form because of positive, trust-building experiences between dyads in the workplace, and over time a critical mass of high LMX relationships expands all over a workplace so that everyone benefits (Pellegrini et al., 2010). The basis of LMX is that (Dulebohn et al., 2012, p. 1744): “If leaders are seen as rewarding followers based on their performance, and stimulating them to perform beyond expectations with transformational leadership, a constructive relationship with their followers is very likely to emerge.” In terms of safety, it is imperative that supervisors provide leadership in relation to setting the expectations of employee safety practices. Numerous authors have examined and found that safety leadership was essential for ensuring employee safety outcomes (Hofmann and Morgeson, 1999, Hofmann et al., 2003, Michael et al., 2005, Michael et al., 2006, Mearns and Reader, 2008, Kath et al., 2010). Hofmann et al. (2003) found that LMX acted as a
mediator between the organizational management’s goals and policies, and employees’ safety behaviours. Also, Fernandez-Muniz et al. (2007) found that managers commitment to safety enhances safety performances.

**Theoretical framework 2: Positive Organizational Behaviour (POB)**

It is only in the decade that the potential benefits for managers are emerging from using a Positive Organizational Behaviour (POB) framework. POB provides a lens for examining individual attributes that positively contribute to increased employee outcomes (Luthans et al., 2007b). The basic assumption is that employees have varying levels of cognitive and emotional resources, which can be harnessed by managers to improve employee outcomes (Avey et al., 2011). For example, some researchers have focused on examining the potential employee performance’s benefits of individual attributes such as psychological capital (Avey et al., 2008, Avey et al., 2009, Avey et al., 2011, Story et al., 2013). In this research one POB variable – psychological capital – is used to provide managers with evidence-based knowledge about how it assists in building safe outcomes for doctors working in healthcare organizations.

*Psychological capital.* As stated psychological capital impacts employee outcomes. Psychological capital is comprised of the four separate, though related, constructs of: self-efficacy, hope, optimism and psychological resilience (Luthans et al., 2007b). Self-efficacy is defined as the confidence a person has that he or she will achieve, and as an individual factor, has been shown to predict student performance in tertiary education (Bean and Eaton, 2001-2002). Hope refers to a person’s strength of will and commitment to accomplish set goals (Luthans et al., 2007b). Optimism accounts for a person’s expectation in a positive outcome. Finally, resilience captures a person’s ability to bounce back after facing a significant setback or challenge. Together, these four characteristics indicate the level or stock of psychological
strength that individuals can draw upon to meet their goals. Psychological capital is cultivated through role-modelling and personal development (Gardner et al., 2011). Recent research shows that high psychological capital is associated with higher safety outcomes for nurses (Brunetto et al., 2016). For this reason, the variable psychological capital (PsyCap) is expected to be correlated with Safety LMX (Hypothesis 1). As people with higher levels of psychological capital are more driven (i.e. higher levels of self-efficacy), and more able to push through organizational challenges, psychological capital is expected to predict individual’s inclinations towards an accreditation focused culture, in addition to an effective safety culture (Hypothesis 2).

**Theoretical framework 3: Cooper’s (2000) model of safety culture**

The safety culture of an organization is “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's health and safety management” (ACSNI, 1993). To measure safety and accreditation culture, the model has been built on the Cooper’s (2000) model of safety culture, which is in turn based on Bandura’s (1986) model of reciprocal determinism (which means that employee’s work practices are influenced by an interplay of management policies, directives and role modelling as well as the environment in which they operate and vice versa). The model comprises three dimensions: the situational aspect (it captures the policies, procedures, management structures and responsibilities related to safety outcomes), the psychological aspect of safety (it captures the feelings of employees), and the behaviour aspect (it captures the safety behaviours).

In terms of operationalizing the situational dimension (encompassing policies, procedures, management directives related to safety outcomes), the research was guided by
Nieva and Sorra (2003, p. 9), who argued that “management assessments of patient safety policies and practices in their organizations … [were] … represented by formal policies and standard operating practices… provid[ing] the leadership in healthcare organizations with information about the status of official organizational practices”. Similarly, Katz-Navon et al. (2005) argued that the situational dimension must capture employees’ perceptions about the depth and breadth of details concerning safety procedures (that is, is it limited to specific processes or are there formal safety procedures evident across all organizational activities?) and Meyer et al. (1993) argued that managerial goals and priorities were evident by examining their commitment to employees training about safety. Also, DeJoy et al. (2004) found that three factors studied in relation to accident rates were safety activities of management and safety personnel, anticipation of hazards and safety training. These findings confirm that safety procedures and training have been identified as two of the key factors affecting safety and therefore are included within the situational dimension of safety culture. Importantly, the situational dimension provides the platform on which the behavioral and psychological aspects of safety culture are built. So, in line with previous research findings (i.e. DeJoy et al, 2004; Zohar, 2010), the model implied that employee safety attitudes and behaviors result from management safety policies, procedures and opportunities for training on safety issues.

In terms of operationalizing the psychological aspect of safety (capturing employees’ attitudes and perceptions about safety policies), the key variable identified as predicting safety is managerial priority of safety (Katz-Navon et al., 2005). This variable captures whether the attention and activities of supervisors are evidence that safety is their high priority (and “the talk matches the walk”). Unless employees perceive that their supervisors have safety as a high priority, they will not be motivated to act safely themselves. Choudhry et al. (2007, p. 1000) summarize the point by arguing that “while safety culture is about good
safety attitudes, it is also about good safety management established by organizations” and therefore a comprehensive measure of safety culture must include employees’ perceptions of supervisors’ safety priorities.

In terms of operationalizing the behavioral aspect of safety culture (capturing the actions and behavior related to safety) the key variables are safety compliance behavior (Neal and Griffin, 2006), which measures the extent to which the core activities of healthcare workers adhere to safe working practices - such as washing hands before handling each patient, and in-role safety performance (Williams and Anderson, 1991), which captures the extent to which the tasks and behaviors of healthcare workers meets organizational expectations of in-role performance. Neal and Griffith (2006) argued that employees’ safety behaviors - including discretionary safety activities - were a function of the extent to which they believed that the organization expected and rewarded exemplar safety practices.

**Accreditation.** Accreditation within healthcare settings is a widely used and well-known assessment method able to measure and influence the quality and effectiveness of healthcare processes (Pomey et al., 2005, Pomey et al., 2010). It relies on the principle that the observance to evidence-based standards impacts positively on the quality and the safety of patients’ care, even if few relations between the accreditation status and empirical measures of quality and safety have been proven (Miller et al., 2005). Starting from the idea that a better system will lead to a better care, voluntary or mandatory accreditation processes have been implemented all over the world (Greenfield and Braithwaite, 2009). In Italy, the accreditation process is an essential part of the healthcare system to evaluate if public or private healthcare organizations meet a set of nationally or regionally defined quality standards (Brusoni et al., 2007).

Even if it is still unclear if there is an evidence based cause-effect relationship
between an organization’s accreditation status and its safety and quality outcomes, scholars seem to agree that healthcare professionals that had to face an accreditation process, generally have a positive attitudes to patient safety (Morris, 2012, Martin, 2013).

So, authors define accreditation culture as “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organization's compliance management system”. Following the empirical evidence that people with higher levels of accreditation culture show more attitudes to perceive patient safety, accreditation culture is expected to predict individual’s inclinations towards safety culture (Hypothesis 3).

7.5 Methods

This study uses a positivist methodological approach to test a model empirically using Structural Equation Modelling (SEM).

*Instruments.* Safety LMX, PsyCap and Safety culture measures were from the extant literature and were presented using statements to be rated on a 6-point Likert-type scale, with 1 = strongly disagree, ranging to 6 = strongly agree. The safety component of supervisor-employee relationship was captured using a high-order factor that combined six of seven-item from the leader-member exchange uni-dimensional scale (LMX-7) (the first item of this scale was removed to enhance overall model fit), developed by Graen and Uhl-Bien (1995), two item from Hofmann and Morgeson (1999) safety communication scale, and two item from Katz-Navon, Naveh, and Stern’s (2005) managerial safety practice scale. It possessed good reliability with a composite reliability of .94, and an average variance extracted score of .71. To measure PsyCap, the shortened 14-item scale of Luthans et al. (2007a) has been utilized. It possessed good reliability with a composite reliability of .91, and an average variance extracted score of .72. The first item of this scale was removed to enhance overall model fit,
leaving a composite reliability of .94 and an average variance estimate of .71. The situational component of safety culture was captured by three of four-item Katz-Navon et al. (2005) safety procedures’ scale adapted from Brunsson and Jacobsson (2000) and employee’s satisfaction with (safety) training (Meyer et al., 1993). As a higher-order variable the combined scale has reasonable internal reliability as indicated by the composite reliability coefficient of .77 and an average variance estimate of .62. The psychological component of safety culture was captured using Katz-Navon et al. (2005) seven-item priority of safety scale adapted from (Zohar, 2000). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .92 and an average variance estimate of .74. The behavioural component of safety culture was captured using a high-order factor that combined safety compliance scale (Neal and Griffin, 2006) and in-role (safety) performance (Brunetto et al., 2015). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .76 and an average variance estimate of .52.

The accreditation culture’s measure, developed from the Cooper’s (2000) model (discussed above), was tested through this study, with a panel of doctors working in public and private Italian healthcare organizations. The scale used against stated questions was consistent the above items, with 1 = strongly disagree, ranging to 6 = strongly agree. An example of the six-item scale used to capture the situational component of accreditation culture was: “My hospital promotes training initiatives on accreditation”. An example of the six-item scale used to capture the psychological component of accreditation culture was: “I believe that knowledge of the accreditation standards might change staff’s way of working”. An example of the four-item scale used to capture the behavioural component of accreditation culture was: “I report to my hospital board the non-compliance with accreditation standards”. The measure had good reliability with a composite reliability score of .81, and an average variance extracted score of .59. To develop and validate the new
measure (i.e. accreditation culture), and undertake confirmatory factor analysis to ensure the reliability of all measures used in the analysis, it has been utilized the reliability assessment framework of Hinkin (1998) and Ping (2004). Once obtained a valid model with the total sample, it has been also undertaken cross-validation as advocated by Hair et al. (2010), and the reliability of all measures remained constant (i.e. above the require .7, and within .10 of the reliability score for the larger sample size).

The item reliability and inter-correlations of the construct used in the model are attached in Table 7-1.

### Table 6-1 – Reliability and inter-correlations of items used in analysis

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<th>CR</th>
<th>AVE</th>
<th>MSV</th>
<th>ASV</th>
<th>PsyCap</th>
<th>Safety LMX</th>
<th>Safety culture</th>
<th>Accreditation culture</th>
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<td>PsyCap</td>
<td>0.911</td>
<td>0.721</td>
<td>0.340</td>
<td>0.255</td>
<td>0.849</td>
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<tr>
<td>Safety LMX</td>
<td>0.936</td>
<td>0.709</td>
<td>0.388</td>
<td>0.210</td>
<td>0.309</td>
<td>0.842</td>
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</tr>
<tr>
<td>Safety Culture</td>
<td>0.763</td>
<td>0.524</td>
<td>0.388</td>
<td>0.302</td>
<td>0.514</td>
<td>0.623</td>
<td>0.724</td>
<td></td>
</tr>
<tr>
<td>Accreditation Culture</td>
<td>0.809</td>
<td>0.590</td>
<td>0.358</td>
<td>0.255</td>
<td>0.566</td>
<td>0.430</td>
<td>0.0598</td>
<td>0.768</td>
</tr>
</tbody>
</table>

Sampling. Data (N. 1125) has been collected in 2015 from doctors working in Italian healthcare settings, using a survey-based, self-report strategy. After involving the scientific board of most Italian medical scientific societies through the Italian federation of the medical scientific societies (FISM), electronic surveys were sent to associated doctors by e-mail, supported by a note explaining the research and confirming the anonymity.

Demographics, sample adequacy & model fit assessment. Three control variables were used: gender, role and organization. Of the sample, 30.4% were female, and 69.6% were male. 28.5% were doctors with a professional role (clinicians), 26.9% were doctors with some managerial responsibilities, and 44.6% were doctors directing hospital’s units or departments. Moreover, of the sample, 54.7% worked in public hospitals, 7.9% worked in private (accredited) hospitals, 3.9% worked in public research hospitals, 3.0% worked in
private research hospitals, 26.1% worked in local health authority. Analysis yielded that the organization where the person was employed in had a very small, but significant effect on their safety culture (.021*).

To ensure the data was completed with consideration by the participants, it has been undertaken a common methods variance test using Harman’s Single Factor Test. One factor was explained by 23.1% of the variance, indicating that there is a low chance of common method bias. The higher-order measurement model used in the analysis had acceptable fit, with CMIN/DF at 2.293 (acceptable under 5), CFI and .973 (acceptable over .9) and RMSEA at .045. The final, measure model was acceptable with CMIN/DF at 2.640, CFI at .955 and RMSEA at .038 (good under .05).

### 7.6 Results and findings

The findings show that all hypotheses are supported (see Figure 7-1). The findings indicate that supervisor-employee relationships and psychological capital accounted for more than two-fifths of the accreditation culture. Additionally, supervisor-employee relationships, psychological capital, and accreditation culture explained more than half of the safety culture.

The context of this study is a lack of empirically tested models and reliable instruments for assessing safety culture (Trincher and Farr - Wharton, 2015, Brunetto et al., 2016). Previous research had identified individual factors affecting safety culture, and some had developed models (Choudhry et al., 2007), but none had tested a model in a causal chain.
The major contribution of this study is to conceptualise, develop and test empirically a new safety culture model, by firstly using a comprehensive review of relevant theoretical frameworks, comprising evidence-based key predictors of ensuring a safety culture. The model is theoretically embedded within three frameworks: Social Exchange Theory (Blau, 1964), Positive Organizational Behaviour (POB) (Luthans et al., 2007b) and Cooper’s (2000) conceptual safety framework. The three frameworks are required because of the complexity identified in the literature with capturing the safety predictors in healthcare setting (Resar, 2006, Flin, 2007).

Using the SET framework, the study tested and found the impact of workplace relationships on safety culture. This component of the research has confirmed previous ones (Hofmann and Morgeson, 1999, Hofmann et al., 2003, Michael et al., 2005, Michael et al., 2006, Mearns and Reader, 2008, Kath et al., 2010). Moreover, the study used the POB framework to test the impact of psychological capital of employee on accreditation and safety
culture. The findings add to research by Eid et al. (2012) and Brunetto et al. (2016) in identifying the relevance of this variable in achieving an effective safety culture. Hence, the contribution of this paper is that it not only used SET and POB frameworks as had been used in previous research to identify important safety variables, but also used Coopers model of safety culture to develop a more robust and comprehensive model. Whilst previous research had identified aspects of the model, no previous research had empirically tested a comprehensive model of accreditation and safety culture that clearly identifies a causal chain for healthcare managers to follow so as to embed an effective safety culture. The results seem to confirm Alper and Karsh (2009) multi sector analysis based on literature’s review that classified the antecedents of employees safety behaviours as “individual characteristics”, “information/education/training”, “design to support worker needs”, “safety climate”, “competing goals”, and “problems with rules”.

In terms of specific components of the new comprehensive model of accreditation and safety culture, the findings found that the SET factor - (LMX safety-related) and POB (PsyCap) did predict accreditation and safety culture in a causal chain. This required developing/modifying the LMX instrument based on a review of the safety literature.

Additionally, the situational component of safety culture was obtained by combining and testing a reduced scales form of Katz-Navon et al. (2005) formal safety procedures scale and employee’s satisfaction with safety training (Meyer et al., 1993); and the psychological component of safety culture was obtained by modifying an existing measure of priority of safety (Katz-Navon et al., 2005) and the behavioural component of safety culture was obtained by testing and modifying a reduced scale from safety compliance (Neal and Griffin, 2006) and testing a new in-role safety performance instrument developed by Brunetto et al. (2016). These instruments were used to firstly develop higher order factors, which were then
robustly tested using SEM.

7.7 Implication for management

The implications of the research are numerous. The first contribution of this paper is that it has empirically developed and tested a comprehensive, evidence-based and cost effective platform based on rigorous analysis for management to ensure that they have the foundations of a safety culture embedded in their healthcare organisations to improve patient safety (Resar, 2006, Flin, 2007).

The second contribution of this research is that it has underlined the relevance for hospitals’ top manager to focus on building effective workplace safety relationships and to define clear safety goals. Among other industries, also those who manage healthcare organizations seem to face a conflict between competing goals such as safety outcomes - which are initially resource intensive - versus high profits/costs reduction (Alper and Karsh, 2009). The results of the analysis should increase an active e pervasive management involvement in determining safety priorities and subsequent managerial actions. The relevance of the impact of the quality of the supervisor-subordinate relationship on the staff’s level of safety behaviour, draws attention on the need to empower hospital’s middle managers, to provide them reliable quality and safety performance management system, and to share pro-performance values. Moreover, following Mannion et al. (2005, p. 438), “these in turn highlight the importance of contingent leadership: leadership that is able to express and embody corporate vision, but equally able to follow through with the transactional details.”

Moreover, the third contribution of this research is that it has assessed the great impact of staff’s psychological capital on their perceptions of the organization’s safety priorities and their compliance to the organization’s safety procedures. This finding confirms
previous research, that examine the role of employees’ psychological capital on organizational performance by improving their attitudes, behaviours, and performance (Avey et al., 2010, Avey et al., 2011). Those results highlight the relevance for the top manager to develop and manage employees’ level of psychological capital, implementing a participative management and a self-determination approach, encouraging innovation, and developing a culture of integrity, trust, and respect (Sharma and Sharma, 2015). Those findings should provide a starting point for further research to help healthcare organizations to increase their commitment to safety.

### 7.8 Limitation

This paper has several limitations. In the first instance, data was collected through the use of self-report surveys. While arguably, this mechanism provides one of the richest sources of key data concerning organisational phenomenon (Mannion et al., 2005, p.438), the data can contain common method variance. To reduce the instance of common method variance in data, (Conway and Lance, 2010) recommend two strategies; (a) separating the measurement of the criterion and predictor variables psychologically, and (b) ensuring that the survey is anonymous. Additionally, generalizability will improve as this model in tested in other countries to ensure that the Italian healthcare context was not an aberration.

### 7.9 Conclusion

Achieving safe patient’ outcomes is an on-going battle for healthcare organizations. Previous research had tended to use one theoretical framework to develop an evidence-based model. Developing safe outcomes for professional is complex and therefore requires a broader theoretical framework to captures the different influences on human behaviour. The advantage of this research is that it uses SET to capture the organizational influence of the relationship with the supervisor and it uses POB to capture the influence of individual
attributes on safety outcomes and the Cooper’s safety framework to capture how organisational and individual attributes impact safety outcomes. The end product is a better understanding of the multiple influences on humans in achieving safety outcomes.

8. Discussion, conclusion and synthesis

8.1 Introduction

The basis of this thesis was that the patient safety issue is of paramount relevance all over the world, because of the high (and often, still, under-reported) numbers of preventable patients’ deaths and injuries related to the process of care. To be able to create a safer environment within healthcare organisations appears to be one of the main goals of most OECD countries, and Italy is no exception. The increasing cost sustained by the Italian healthcare system as a result of medical malpractices have increased the urgency of providing a stronger theoretical framework for informing safety practices. To this end, increased regulation has been developed. This thesis is timely because in April 2017 a new Italian law (legge 24/2017, so-called “Legge Gelli”) was implemented: (i) to redefine malpractice responsibility at the organisational and individual level; (ii) to assure a fair patient reimbursement process, and (iii) to increase the governance of the level of patient safety and decrease the negative outcomes of the process of care within Italian healthcare organisations. Hence, this thesis adds to the growing body of legal, community and economic imperatives calling for increased safety culture within hospitals as a means of reducing adverse events.

There is mounting evidence from the literature that the best way to make tangible changes that reduce hospital accidents is to create a pervasive safety culture (Weick, Sutcliffe & Obstfeld 1999), and the promotion of a culture of safety among the healthcare providers and professionals has become, since the 1990s, a mantra recommendation by the WHO to
increase patient safety. However, the task is not an easy one to achieve. Many approaches have been tried, and many aspects of safety culture have been examined. The main issues are examined in depth below because they provide a platform from which to detail the contributions of this thesis.

In summary, the safety agenda in healthcare settings has been retarded for the past 20 years by the lack of a reliable definition, usable frameworks, models and tools (Fleming 2005; Guldenmund 2000; Hopkins, SM & Weathington 2006; Human-Engineering 2005; Lei, Naveh & Novikov 2016; Spurgeon et al. 2017). The first problem to be addressed in understanding safety culture is to define its borders and to measure the magnitude of the problem. In the place of addressing the real issue, there has been continuing debate about safety climate and safety culture ‘clouding’ the issue. This has taken the focus away from finding evidence-based solutions and instead has continued to provide arguments for and against climate/culture and instruments to assess them, without tackling the bigger issue of how to embed better patient safety practices within healthcare organisations (Guldenmund 2000; Spurgeon et al. 2017; Zohar 2010). Additionally, far less time has been dedicated to using theory to conceptualise and define safety climate/culture. Moreover, the tools used to capture climate/culture have not used rigorous methods of analysis to confirm internal or construct validity and, as such, poorly conceived instruments have been used to measure a complex issue for improving safety in a complex environment (Singla et al. 2006; Trinchero & Farr-Wharton 2015).

Additionally, without a valid reliable framework of analysis, it is impossible to effectively develop an instrument to assess the safety culture and then to analyse the impact that antecedents have on safety culture, and in turn, the impacts that safety culture itself has on clinical (patients’) outcomes. To address the safety culture issue within the healthcare organisations, a multiple frameworks model is required, that is able to capture the
peculiarities and the complexities of the system as a whole. As previously explained, none of the models delivered in other industries seems to be suitable for the healthcare sector, because single-factor solutions and single path models aren’t considered useful for finding reliable pathways to apply changes in a system that relies almost entirely on humans and not machines (Fleming 2005). This is especially the case when considering the multiple professional agendas (e.g. knowledge and codes of practice) in play.

Despite the continuous WHO warnings over the last 20 years, while hospital complexity has grown and the healthcare demands of populations have increased (escalated also because of the global ageing phenomenon of the western countries), a reliable tool to assess safety culture has still not been identified. So the aim of this research project was to build and test an evidence-based, reliable and usable model to address the safety culture issue among professionals within the healthcare sector. The research project started by challenging the reliability of one of the most used tools to assess safety culture within healthcare organisations – the US’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture (HSPOSC) (Nieva & Sorra 2003) (see Chapter 5: The premise of the research).

After identifying the low reliability of HSPOSC, this thesis addressed the void in the literature by using SET and POB as the theoretical frameworks informing the variables tested to capture human behaviours in the workplace. The theoretical frameworks provided the basis on which the safety model was embedded to create a new theoretically informed comprehensive model to assess safety culture. Then the research project analysed the literature about safety culture, using a SET and POB lens, to find a reliable and usable definition of safety culture itself. The ACSNI definition of safety culture was chosen, because whilst it was built in an engineering environment, it was also synergic with the professionals’
roles involved in the process of healthcare. It defines safety culture as:

the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation’s health and safety management (ACSNI 1993, p. 23).

The definition of safety culture chosen led the research to the missing ingredient from the safety culture debate – an operationalisable model of safety culture – Cooper’s (2000) theoretical framework. While Cooper (2000) had proposed a conceptual framework, it had not been operationalised. Also, Cooper’s model was similarly deficient to other safety culture models in attempting to capture a complex work environment with one simple framework. Instead, the combination of different professional groups, patients (often with complicated diagnoses, including dementia) and complementary technologies meant that an understanding of how humans respond to adverse events and how workplace relationships affect an employee’s behaviour was necessary to more comprehensively capture the healthcare safety culture context. Hence, using SET, POB, and Cooper’s (2000) theoretical frameworks, the research project operationalised and tested a new comprehensive model of safety culture, and tested whether SET factors predicted accreditation and safety culture in a causal chain, within the Italian healthcare organisations. The implications of the findings are detailed below (see Chapter 6: The first step of the research and Chapter 7: The second step of the research).

8.1.1 Research questions

As stated, the premise of the research is that the US’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture (HSPOSC) (Nieva & Sorra 2003) tool was found to have low reliability when tested using Italian hospital data. This was identified as a problem because it is one of the most often used, and industry-accessible, surveys for assessing hospitals’ safety culture worldwide. These findings were presented, after a rigorous double-blind review (paper acceptance rate lower than 30%), in 2015 at the
The 75th Annual Meeting of the Academy of Management as “Trinchero E., Farr-Wharton B., Psychometric Properties Of The Hospital Survey On Patient Safety Culture: Italian Findings”, and based on the feedback, the paper was modified and is now under review in Safety Science as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. How Safe is Safety Culture Analysis? A qualitative review of previous analyses of Hospital Surveys on Patient Safety Culture (HSPOSC), and a best practice template for future replication using Italian data.”

This thesis followed multiple steps to address the research questions. The first step of the research investigated how LMX and engagement affected the situational, psychological, and behavioural aspects of safety culture. Hence, the research question guiding data collection was:

**Research Question 1:** What is the impact of LMX upon healthcare professionals’ perception of engagement, and in turn, upon the quality of psychological, behavioural and situational aspects of safety culture in Italian acute care hospitals?

As stated in Chapter 3, there was some research that had examined several aspects of this study. For example, other researchers (DeJoy et al. 2010; Didla, Mearns & Flin 2009; Hofmann & Morgeson 1999; Hofmann, Morgeson & Gerras 2003; Kath, Marks & Ranney 2010; Mearns & Reader 2008; Michael et al. 2005; Michael et al. 2006; Tucker, S et al. 2008) had used SET to examine safety issues. This study builds on that body of work by showing the integral part played by SET variables – LMX and engagement – in achieving safety outcomes. The next step involved operationalising Cooper’s model of safety culture for acute care hospitals using Italian data as part of a comprehensive model of safety culture. Cooper’s (2000, 2002) model of safety culture defines that safety culture includes three dimensions: situational (seizing the organisational safety structure), psychological (seizing staff
perceptions about safety), and behavioural (seizing staff’s safety behaviours). Cooper (2000, 2002) stated that the three dimensions offered the possibility to assess and compare safety culture within different organisations and contexts. The research operationalised the situational dimension of safety culture, identifying safety procedures and safety training as the key factors affecting safety within the working environment and connected with organisational policies and operational processes. Moreover, the research operationalised the psychological dimension of safety culture identifying the perception of the safety priority among staff as the key factor able to capture it. Finally, safety compliance and in-role safety performance have been identified as two of the key factors affecting staff behaviours about safety within the working environment and therefore have been included within the behavioural dimension of safety culture. Additionally, the situational component of safety culture was obtained by combining and testing a reduced form of Katz-Navon, Naveh and Stern’s (2005) formal safety procedures scale and employees’ satisfaction with safety training (Meyer, JP, Allen & Smith 1993); the psychological component of safety culture was obtained by modifying an existing measure of priority of safety (Katz-Navon, Naveh & Stern 2005), and the behavioural component of safety culture was obtained by testing and modifying a reduced scale from safety compliance (Neal & Griffin 2006) and testing a new in-role safety performance instrument developed by Brunetto et al. (2016).

The results of the findings from addressing RQ1 formed the first step of the research process and these results were presented in 2016 at the 76th Annual Meeting of the Academy of Management Conference as “Trinchero E., A Social Exchange Perspective For Achieving Safety Culture In Healthcare Organizations”, and the feedback was used to modify the paper accordingly. The paper is currently under review (revise and resubmit status) in the International Journal of Public Sector Management as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. A Social Exchange Perspective for Achieving Safety Culture in Healthcare
The second step of the research investigated how Safety LMX and PsyCap affected accreditation culture as a second order variable (comprising situational, psychological and behavioural component variables) and safety culture as a second order variable (comprising situational, psychological and behavioural component variables). This required developing/modifying the LMX instrument based on a review of the safety literature. Hence, the research questions guiding data collection were:

**Research Question 2:** What is the impact of LMX safety-related on accreditation culture in Italian acute care hospitals?

**Research Question 3:** What is the impact of Positive Organisational Behaviour (Psychological capital) on accreditation culture in Italian acute care hospitals?

**Research Question 4:** What is the impact of accreditation culture on safety culture in Italian acute care hospitals?

As stated in Chapter 4, data was collected from doctors to address these research questions. Previous research by Eid et al. (2012) had examined the role of PsyCap on safety outcomes, and this study builds on that work. However, no work had previously been undertaken on the antecedents of adopting the accreditation process. Firstly, this study had to build a research-informed valid instrument, ensuring both internal and construct validity using established methodological protocols, and then test it. The details about the sample and methods used for analysis are detailed in Chapter 4. Subsequently, the second step of the research was published as “Trinchero, E., Farr-Wharton, B., & Brunetto, Y. 2017. Workplace relationships, psychological capital, accreditation, and safety culture: a new framework of analysis within healthcare organizations. Public Organization Review”. The article is
To explain how each of the research questions was examined in the study, a comprehensive list of the hypotheses that were tested are listed in Table 8-1.

### Table 8-1 – Hypotheses that were tested

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Description</th>
<th>Hypotheses accepted</th>
<th>Hypotheses rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>High LMX is associated with high engagement for healthcare professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2</td>
<td>High PsyCap is associated with high Safety LMX for healthcare professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3</td>
<td>High LMX is associated with high perception of the situational dimensions of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
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<tr>
<td>H4</td>
<td>High LMX is associated with high perception of the psychological dimension of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
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<tr>
<td>H5</td>
<td>High LMX is associated with high perception of the behavioural dimension of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H6</td>
<td>High engagement is associated with high perception of the situational dimensions of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
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<tr>
<td>H7</td>
<td>High engagement is associated with high perception of the psychological dimensions of safety culture for healthcare professionals.</td>
<td></td>
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</tr>
<tr>
<td>H8</td>
<td>High engagement is associated with high perception of the behavioural dimensions of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H9</td>
<td>High perception of the situational dimension of safety culture is associated with high perception of the psychological dimension of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H10</td>
<td>High perception of the situational dimension of safety culture is associated with high perception of the behavioural dimension of safety culture for healthcare professionals.</td>
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<tr>
<td>H11</td>
<td>High perception of the psychological dimension of safety culture is associated with high perception of the behavioural dimension of safety culture for healthcare professionals.</td>
<td></td>
<td></td>
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<tr>
<td>H12</td>
<td>High Safety LMX is associated with high safety culture for healthcare professionals.</td>
<td></td>
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</tr>
<tr>
<td>H13</td>
<td>High PsyCap is associated with high safety culture for healthcare professionals.</td>
<td></td>
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<tr>
<td>H14</td>
<td>High Safety LMX is associated with high accreditation culture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9.3

<table>
<thead>
<tr>
<th></th>
<th>Hypothesis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H15</td>
<td>High PsyCap is associated with high accreditation culture for healthcare professionals.</td>
<td></td>
</tr>
<tr>
<td>H16</td>
<td>High accreditation culture is associated with high safety culture for healthcare professionals.</td>
<td></td>
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</tbody>
</table>

8.2 Findings and discussion

In 2000, Guldenmund (2000, p. 243) stated:

All in all, the models on safety culture are unsatisfactory to the extent that they do not embody a causal chain but rather specify some broad categories of interest and tentative relationships between those.

The first paper (see Chapter 5: The premise of the research) confirmed the lack of validity and reliability of the most used available approach to assess hospital safety culture perceptions among staff (the USA’s Agency for Healthcare Research and Quality (AHRQ) Hospital Surveys on Patient Safety Culture - HSPOSC). This is because previously only the Cronbach’s alpha score was used to test for the reliability of the instrument. The findings from this study cast doubt on the validity of previously published studies because comprehensive EFA and CFA tests were not performed on the tool and, importantly, the use of large sample sizes could also have led to a misleading enhancement of the value of the tool (Trinchero & Farr-Wharton 2015). For this reason, a more rigorous and robust methodological approach was applied to test the validity and reliability of the AHRQ method of inquiry. The findings confirmed that only a few factors (three out of twelve) have appropriate psychometric properties. Although the AHRQ instrument was successful in raising the attention of the hospitals’ top managers about the safety culture issue and managerial implications, it was found to be methodologically inaccurate. This is because researchers have used multivariate analysis on multi-construct data to study the impact of antecedents on consequences in a causal chain (Trinchero & Farr-Wharton 2015).

Therefore, to close the gap between practice and research, the thesis has used
theoretical frameworks to inform the development of a new and more reliable model that is methodologically capable of exploring causation in relation to safety culture. This means that the methods used to analyse the model can predict the impact of specific antecedents on safety culture in a causal chain. The use of a reliable and valid tool also provides a framework for beginning the process of benchmarking safety cultures across departments in one healthcare organisation, and more broadly across locations. It is not until the issue can be measured accurately that performance management can really begin. In this case, theory informed the development of a safety culture assessment model and tool that was tested using Italian data from doctors, nurses, and other healthcare professions. This means that the foundations have been laid in this study to begin the process of increasing patient safety.

The modelling process has been twofold. The research process started with the development and test of a new systemic model of safety culture using SET and Cooper’s frameworks. Then, POB’s framework has been added, along with the inclusion of the accreditation culture as a new antecedent of the safety culture. The findings indicate that all the hypotheses are supported apart from the fifth hypothesis.

Importantly, the first part of the modelling process used SET and Cooper’s frameworks to develop a new systemic model of safety culture, while model reliability and fit were tested for the lower-order structure, and later in the higher-order structure. In the final model, SET variables’ LMX and employees’ engagement predict almost two-fifths of the situational dimension of safety culture and one-fifth of the psychological situation of safety culture. Together, LMX, employees’ engagement, the situational and the psychological dimensions of safety culture, predict almost half of the behavioural dimension of safety culture. The first part of the modelling process delivered a systemic model of safety culture that is strongly embedded in the literature, empirically developed and validated, and offers a reliable path for scholars and hospital managers to assess, in a causal chain, the different
dimensions of safety culture.

The second part of the modelling process used SET, POB and Cooper’s frameworks to test a more comprehensive model of safety culture, which also included the impact of the accreditation culture on safety culture. The inclusion of the POB framework and the accreditation culture followed the complexity identified in the literature with capturing the safety predictors in a healthcare setting (Eid et al. 2012; Martin 2013; Morris 2012). Again, model reliability and fit have been tested in the lower-order structure, in the higher-order structure and in the final model. Filling the gap in the literature, the research has developed a comprehensive definition of accreditation culture and it has developed and tested a valid measure to assess it among healthcare professionals.

In terms of specific components of the new comprehensive model of accreditation and safety culture, the findings explain that the SET variable (Safety LMX) and the POB variable (PsyCap) predict more than two-fifths of the accreditation culture. This means that the higher the PsyCap of doctors, the more likely they are to adopt behaviour supportive of accreditation process. Together, Safety LMX, PsyCap and accreditation culture predicted more than half of the safety culture, in a causal chain. This means that, if the organisation reaches the goal that allows the doctors to perceive the accreditation process as meaningful and valuable, it can help to increase their compliance with safety culture. The first part of the modelling process delivered an empirically developed and tested more comprehensive model of safety culture that includes key predictors of safety culture such as the psychological capital of the employees and their accreditation culture.

8.3 Contributions to literature and implications for practice

This is the first time that a model which is embedded within the literature offers a reliable path for scholars and hospital managers to assess in a causal chain, a hospital’s accreditation and safety culture. This research project developed new knowledge about the
In terms of the theoretical contribution of the thesis, it is the first time that SET and POB has been used to conceptualise the impact of workplace relationships on accreditation and safety culture in the healthcare sector. Hence, the PhD study showed the usefulness of combining SET and POB together as predictors of safety culture as conceptualised by Cooper and operationalised in this thesis. In this way the model was able to examine the impact of individual attributes and workplace processes on psychological, behavioural and situational aspects of accreditation and safety culture in the healthcare sector. The SET framework lens has been previously used to analyse the association between workplace relationships and safety issues in other industries (Hofmann, Morgeson & Gerras 2003; Michael et al. 2005), but not in the healthcare sector, and not within the Italian healthcare sector.

In terms of the contribution regarding the conceptual framework, this research developed new knowledge about the impact of workplace relationships on psychological, behavioural and situational aspects of accreditation and safety culture in the healthcare sector. Furthermore, it delivered an operationalised tool to assess the different dimensions of safety culture proposed by Cooper (2000). It also offered a new structured definition of accreditation culture and an assessment tool to measure it. Also, the study chose POB’s framework to analyse the effect of staff’s psychological capital on accreditation and safety culture. The results are in line with the research by Eid et al. (2012) and Brunetto et al. (2016) in isolating the importance of those dimensions to enhance a healthcare organisation’s safety culture.

Finally, the implications for evidence-based best practice from this thesis are profound. The findings of the research project provide healthcare managers with an empirically robust model for examining accreditation and safety culture within Italian hospitals, while further testing of the instrument in other countries will likely increase the
generalisability of these findings. The research results emphasise the role and responsibilities of hospitals top and middle management to guide staff involved in the processes of care in the right direction. Hospital leaders seem to have the responsibility to create the right climate and environmental conditions among staff to let them be able to appreciate the situational dimension of safety culture offered by the organisation. This means that they must follow (implement) the stated hospital safety-related standards and procedures and, additionally, enhance the learning opportunities for staff offered by the hospital. Moreover, leaders seem to have to build effective workplace relationships in order to gain the trust and the respect from doctors and nurses to be able to influence their psychological dimension of safety culture (staffs’ safety beliefs) and behavioural dimension of safety culture (staffs’ actions and behaviours). Additionally, when employees have low PsyCap, they are less likely to adopt appropriate behaviour consistent with an accreditation culture. Hence, hospitals may have to increase upskilling opportunities for those staff. This knowledge provides useful insights for managers in order to increase staff commitment towards safety within healthcare organisations.

8.4 Limitations and further research

This research acknowledges the following main limitations.

The first limitation of the research regards the generalisability of the model. Since the reliability of this model has been proven using Italian hospital data, further research is needed to re-test it to confirm its ability to assess safety culture in the same healthcare settings (acute care hospitals) in other countries, or in different healthcare settings in Italy or other countries. It could be also interesting to assess its exportability to other industries inside or outside Italy.

The second limitation regards the use of self-report surveys to collect data among professionals in the Italian acute care settings. In spite of the fact that self-report surveys offer a great source of relevant data regarding employees’ perceptions, the data can suffer common
method bias. Following Spector et al. (2004), self-report surveys can be used if embedded in the literature, and pattern matching is performed to sustain the data’s interpretation. The occurrence of common method variance in data can be reduced if the measures used have construct validity and there is absence of commonality in items for distinctive variables (Conway & Lance 2010). Moreover, the surveys and the surveys’ processes have been developed assuring “temporal, proximal, psychological, or methodological separation of measurement”, “protecting respondent anonymity and reducing evaluation apprehension”, “counterbalancing question order”, and “improving scale items” (Podsakoff et al. 2003, pp. 878-88). Additionally, as stated, the Harman’s ex-post Single Factor Test has been used, showing low chance of a common method bias (Podsakoff et al. 2003; Podsakoff & Organ 1986).

The choice of a self-reported questionnaire to collect data leads also to the third limitation of the research. Cooper (2000) proposes that the data need to be triangulated using self-report surveys along with data obtained through peer observations, audits and hospital outcomes indicators. This research addresses the issues raised by Cooper by measuring all the dimensions of Cooper’s safety culture model using a self-reported questionnaire, however the limitations raised by Cooper remain. The choice of this research method, as already stated, relies on the willingness to deliver a model that allows hospitals to run internal, functional, and competitive benchmarking of their results, and the feasibility of the approach was paramount in developing the research design. Because “ethnographic approaches, while possibly the most valid from an interpretive perspective, are often costly and time-consuming” (Glendon & Stanton 2000, p. 212), such an approach was not used.

Finally, future research should also address and improve the ability of the model to fully capture the psychological component of safety culture, that in the proposed model has been assessed using Katz-Navon, Naveh and Stern’s (2005) priority of safety construct,

8.5 Summary

The last chapter outlined the relevance of the study and, after a broad presentation of the research questions and the research hypotheses, discussed the findings and the contributions to literature and implications for practice. Finally, the chapter summarises the limitations of the study and possible further research.

9. Appendix

9.1 Ethics approval

No ethical approval is required for this study according to the Italian law 196/2003 and according to Regolamento Regionale Lombardo n.9, July 2006 (BURL n.29, II suppl. Ord. 21/07/2006).
HUMAN RESEARCH ETHICS COMMITTEE (HREC)
HUMAN RESEARCH ETHICS SUB-COMMITTEE (HRESC)

NOTIFICATION

To: Professor Yvonne Brunetto/Professor Elisabetta Trinchero
   School of Health and Human Sciences
   Yvonne.brunetto@scu.edu.au elisabetta.trinchero@unibocconi.it

From: Secretary, Human Research Ethics Committee
      Division of Research, R Block

Date: 7 May 2013

Project name: Examining the impact of workplace relationships upon the health care professionals perception of engagement, empowerment, wellbeing, affective commitment, trust and in turn, patient safety culture in Italian acute care settings.

Approval Number ECN-13-113

The Southern Cross University Human Research Ethics Committee has established, in accordance with the National Statement on Ethical Conduct in Human Research – Section 5/Processes of Research Governance and Ethical Review, a procedure for expedited review and ratification by a delegated authority of the HREC.

Thank you for your responses, dated the 20 December 2012 to the Chair of the HREC. They are considered as satisfactory and, as previously advised by the Chair on 29 December, we can now issue an approval number.

All ethics approvals are subject to standard conditions of approval.

These should be noted by researchers as there is compliance and monitoring advice included in these conditions.

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HREC Administration
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Dr David Lloyd
Acting Chair, pro tem, HREC
E: david.lloyd@scu.edu.au
HUMAN RESEARCH ETHICS COMMITTEE (HREC)
HUMAN RESEARCH ETHICS SUB-COMMITTEE (HRESC)

STANDARD CONDITIONS OF APPROVAL FOR ALL ETHERICALLY APPROVED
RESEARCH PROJECTS

The following standard conditions of approval are mandatory for all research projects which have been approved by the HREC or a HRESC and have received an ethics approval number.

All reporting is to be submitted through the Human Research Ethics Office, either at Lismore, Coffs Harbour or GCTweed. The email addresses are:
ethics.lismore@scu.edu.au
ethics.tweed@scu.edu.au

Forms for annual reports, renewals, completions and changes of protocol are available at the website:

Standard Conditions in accordance with the National Statement on Ethical Conduct in Human Research (National Statement) (NS).

1. Monitoring
   NS 5.5.7 – 5.5.10
   Responsibility for ensuring that research is reliably monitored lies with the institution under which the research is conducted. Mechanisms for monitoring can include:
   (a) reports from researchers;
   (b) reports from independent agencies such as a data and safety monitoring board;
   (c) review of adverse event reports;
   (d) random inspections of research sites, data, or consent documentation; and
   (e) interviews with research participants or other forms of feedback from them.

2. Approvals
   (a) All ethics approvals are valid for 12 months unless specified otherwise. If research is continuing after 12 months, then the ethics approval MUST be renewed. Complete the Annual Report/Renewal form and send to the ethics office.
   (b) NS 5.6.5
   The researchers will provide a report every 12 months on the progress to date or outcome in the case of completed research including detail about:
   Maintenance and security of the records.
   Compliance with the approved protocol.
   Compliance with any conditions of approval.
   Changes of protocol to the research.

3. Reporting to the HREC
   (c) The researchers will immediately notify the ethics office, on the appropriate form, any change in protocol. NS 5.5.3
   (d) A completion report, on the appropriate form, must be forwarded to the ethics office.
   (e) The researchers will immediately notify the ethics office about any circumstance that might affect ethical acceptance of the research protocol. NS 5.5.3

It’s all about U
scu.edu.au

Lismore
PO Box 131, Lismore NSW 2480 Australia
T: +61 2 6620 3000 F: +61 2 6620 3700

Coffs Harbour
Hopkins Drive, Coffs Harbour NSW 2450 Australia
T: +61 2 6699 3777 F: +61 2 6699 3051

Gold Coast
Locked Mail Bag 4, Coolangatta QLD 4225 Australia
T: +61 7 5539 1000 F: +61 7 5539 2700
2. Research conducted overseas
   NS 4.8.1 – 4.8.21
   Researchers conducting a study in a country other than Australia, need to be aware of any protocols for that country and ensure that they are followed ethically and with appropriate cultural sensitivity.

3. Participant Complaints
   NS 5.6.1 – 5.6.7
   General information
   Institutions may receive complaints about researchers or the conduct of research, or about the conduct of a Human Research Ethics Committee (HREC) or other review body.

   Complaints may be made by participants, researchers, staff of institutions, or others. All complaints should be handled promptly and sensitively. All participants in research conducted by Southern Cross University should be advised of the above procedure and be given a copy of the contact details for the Complaints Officer. They should also be aware of the ethics approval number issued by the Human Research Ethics Committee.

   The following paragraph is to be included in any plain language statements for participants in research.

   Complaints about the ethical conduct of this research should be addressed in writing to the following:
   Ethics Complaints Officer
   HREC
   Southern Cross University
   PO Box 157
   Lismore, NSW, 2480
   Email: ethics.lismore@usc.edu.au

   All complaints are investigated fully and according to due process under the National Statement on Ethical Conduct in Human Research and this University. Any complaint you make will be treated in confidence and you will be informed of the outcome.
9.2 Ethics renewal

Human Research Ethics Committee (HREC)
Human Research Ethics Sub-Committee (HRESC)

ANNUAL REPORT AND/OR RENEWAL OF RESEARCH PROJECT

MONITORING APPROVED RESEARCH
Refer to National Statement on Ethical Conduct in Human Research
Section 5.5

PLEASE TYPE

Name of Project: Previous title: Examining the impact of workplace relationships upon the health care professionals' perception of engagement, empowerment, wellbeing, affective commitment, trust and in turn, patient safety culture in Italian acute care settings. – New title: Workplace relationships, affective commitment, empowerment, patient safety culture: the case of healthcare professionals in Italian private and public acute care settings.

School/Centre: School of Health and Human Sciences

Current Ethics Approval No and Date of approval: Approval Number ECN-13-113

Approved at HREC meeting: 7 May 2013

Name of Supervisor (if applicable): (to sign below): Professor Yvonne Brunello

Email and Telephone: Yvonne.brunello@scu.edu.au - ph: +61 7 55893066 - Mobile: + 61 408192096

Name of Principal Researcher: (to sign below): Elisabetta Flora Olga Trinchero

Email and Telephone: Elisabetta.trinchero@unibocconi.it, e.trinchero.10@student.scu.edu.au

Annual Report: (Compliance with National Statement 5.5.5)

A mandatory condition of ethics approval is that, at regular periods – and at least annually in the duration of the project and at the completion of the project – researchers should provide reports to the relevant review body/s and institution/s, including information on:

(a) progress to date, or outcome in the case of completed research;
(b) maintenance and security of records;
(c) compliance with the approved proposal; and
(d) compliance with any conditions of approval.

In the last year I have developed my study method and refined the survey I'm going to use, I haven't at this stage of the project, started to collect data.

Annual Report/Renewal 2013
Renewal

Ethics approvals should be renewed annually if research is continuing. Please complete the annual report and request a current ethics approval number.

Estimated completion date: December 2016

_________________________________________________________
Signature of Supervisor: .............................................
Date: 28/05/2014

_________________________________________________________
Signature of Researcher: ..........................................
Date: 28/06/2014

WHERE TO SEND

Annual Reports/Renewals to approved ethics projects will be considered by the HREC or a delegated authority of the HREC.

Please send one copy electronically to the appropriate ethics office.
ethics.lismore@scu.edu.au
ethics.goldcoast@scu.edu.au
ethics.coffs@scu.edu.au
9.3 Premise of the research survey

Ricerca sulla sicurezza del paziente

Istruzioni

Il questionario chiede la sua opinione sulle tematiche della sicurezza del paziente e degli errori in sanità. Sono necessari circa 10-15 minuti per la compilazione. Se non si desidera rispondere ad una domanda o se una domanda non risulta pertinente alla propria sfera di attività, è sufficiente lasciare in bianco la risposta.

- In questo questionario si definisce “EVENTO” ogni tipologia di errore, incidente o deviazione da una norma/legge, indipendentemente dalle conseguenze sul paziente.
- In questo questionario si definisce “SICUREZZA DEL PAZIENTE”: evitare e prevenire danni al paziente o eventi avversi legati al processo assistenziale.

SEZIONE A: Unità operativa di appartenenza

Nella compilazione del questionario, pensi all’area di lavoro (unità operativa, dipartimento o area clinica dell’ospedale) nella quale svolge la sua attività prevalente.

1. Indichi in quale unità operativa dell’ospedale svolge la sua attività. Selezioni una sola risposta e specifichi qualora non indicato.
   - 1. Motte unità differenti / nessuna unità operativa specifica
   - 2. Medicina
   - 3. Chirurgia
   - 4. Ostetricia
   - 5. Pediatra
   - 6. Pronto Soccorso
   - 7. Terapia Intensiva (di qualsiasi tipo)
   - 8. Psichiatria/Salute mentale
   - 9. Riabilitazione
   - 10. Farmacia
   - 11. Laboratorio/Anatomia Patologica/Microbiologia
   - 12. Radiologia
   - 13. Anestesia/blocco operatorio
   - 14. Ortopedia/Traumatologia
   - 15. Oncologia
   - 16. Geriatria
   - 17. Neurologia
   - 18. Neurochirurgia
   - 19. Cardiologia
   - 20. Cardiachirurgia
   - 22. Altro, specificare: __________

Indichi il suo accordo o disaccordo con le seguenti affermazioni facendo riferimento alla sua unità lavorativa.

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<tr>
<th>Forte Disaccordo</th>
<th>Disaccordo</th>
<th>Neutro</th>
<th>Accordo</th>
<th>Forte Accordo</th>
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</table>

2. In questa unità gli operatori si aiutano l’un l’altro

3. Abbiamo abbastanza personale per far fronte al nostro carico di lavoro

4. Quando abbiamo molto lavoro che deve essere fatto velocemente, per completarlo, operiamo insieme come una squadra

5. In questa unità le persone si rispettano reciprocamente

190
6. In questa unità i turni sono più lunghi di ciò che sarebbe ottimale per l'assistenza del paziente
   - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

7. Stiamo attivamente facendo qualcosa per migliorare la sicurezza del paziente
   - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

8. Utilizziamo più personale "temporaneo" e "di cooperativa" di quanto sia ottimale per l'assistenza del paziente
   - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

9. Gli operatori hanno l'impressione che i propri errori siano utilizzati contro di loro
   - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

10. Gli errori da noi hanno condotto a cambiamenti positivi
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

11. È solo per caso che qui non accadano errori più seri
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

12. Quando in un'area di questa unità si è veramente sovraccarichi di lavoro, i colleghi vengono in aiuto
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

13. Quando viene riferito un evento (errore, incidente o deviazione dalla norma/regolamento), sembra che sia messo sotto processo la persona piuttosto che il problema
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

14. Dopo aver introdotto cambiamenti per migliorare la sicurezza del paziente, valutiamo la loro efficacia
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

15. Lavoriamo costantemente in emergenza, cercando di fare troppo, troppo velocemente
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

16. La sicurezza del paziente non è mai trascurata per fare più lavoro
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

17. Il personale è preoccupato che gli errori commessi finiscano nella propria scheda personale
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

18. In questa unità abbiamo problemi con la sicurezza dei pazienti
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

19. Le nostre procedure e i nostri sistemi sono in grado di prevenire gli errori
    - Disaccordo □ 1 □ 2 □ 3 □ 4 □ 5

**SEZIONE B: Il Capo**

Indichi il suo accordo o disaccordo con le seguenti affermazioni relative al suo diretto superiore o alla persona a cui risponde direttamente:

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<th>Forte Disaccordo</th>
<th>Disaccordo</th>
<th>Neutro</th>
<th>Acordo</th>
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<tbody>
<tr>
<td>20. Il mio superiore si complimenta quando vede un lavoro fatto in accordo con ciò che stabiliscono le procedure per la sicurezza del paziente</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
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<tr>
<td>21. Il mio superiore considera sfortunatamente le proposte del personale per migliorare la sicurezza del paziente</td>
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<td>22. Quando siamo sotto pressione il mio superiore ci chiede di fare in fretta, persino se ciò significa &quot;dard un taglio/sorvolare&quot;</td>
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<tr>
<td>23. Il mio superiore trascura i problemi di sicurezza che si ripresentano più volte</td>
<td>□ 1 □ 2 □ 3 □ 4 □ 5</td>
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### SEZIONE C: Comunicazioni

Penal alla frequenza con cui accadono i seguenti fatti nella sua unità di lavoro.

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<tr>
<th></th>
<th>Mal □</th>
<th>Raramente □</th>
<th>Qualche volta □</th>
<th>Spesso □</th>
<th>Sempre □</th>
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<tr>
<td>24. Riceviamo informazioni sui cambiamenti posti in essere in seguito alla segnalazione di un evento (errore, incidente o deviazione dalla norma/regolamento)</td>
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<td>25. Il personale può partecipare liberamente se vede qualcosa che possa influire negativamente sulla sicurezza del paziente</td>
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<td>26. Stiamo informati degli errori che avvengono in questa unità</td>
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<td>27. Il personale si sente libero di chiedere chiarimenti relativamente alle decisioni o alle azioni di coloro che hanno più autorità</td>
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<td>28. In questa unità discutiamo le modalità per prevenire li ripetersi degli errori</td>
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<td>29. Il personale ha timore di porre domande quando qualcosa non gli sembra giusto</td>
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### SEZIONE D: Frequenza degli eventi (errore, incidente o deviazione dalla norma/regolamento) riferiti

Ci si riferisce alla frequenza con cui sono segnalati gli errori nella propria unità di lavoro.

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<th>Qualche volta □</th>
<th>Spesso □</th>
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<tr>
<td>30. Quando accade un errore che viene individuato e corretto prima che possa danneggiare il paziente, quanto spesso viene segnalato/reso noto?</td>
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<td>31. Quando accade un errore che non è in grado di danneggiare il paziente, quanto spesso viene segnalato/reso noto?</td>
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<td>32. Quando accade un errore che potenzialmente potrebbe ledere il paziente, ma che nel caso specifico non lo ha fatto, quanto spesso viene segnalato/reso noto?</td>
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### SEZIONE E: Livello di sicurezza del paziente

33. Si chiede di dare una valutazione complessiva del livello di sicurezza del paziente nella propria unità di lavoro.

- 1: Eccellente
- 2: Molto buono
- 3: Accettabile
- 4: Scarso
- 5: Fallimentare

### SEZIONE F: L'ospedale

Indichi il suo accordo o disaccordo con le seguenti affermazioni relative al suo ospedale.

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<td>34. La direzione di questo ospedale garantisce un clima organizzativo che promuove la sicurezza del paziente</td>
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<td>35. Le unità operative di questo ospedale non sono ben coordinate l'una con l'altra</td>
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36. Quando un paziente viene trasferito da un'unità ad un'altra vi è una interruzione della continuità delle cure

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37. C'è una buona cooperazione tra le unità operative che devono lavorare insieme

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38. Informazioni importanti per l'assistenza del paziente sono spesso perse durante i cambi di turno

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39. Spesso non è possibile lavorare con il personale di altre unità operative

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40. I problemi spesso accadono nello scambio di informazioni tra unità operative

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41. Le scelte della direzione di questo ospedale dimostrano che la sicurezza del paziente è una priorità assoluta

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42. La direzione ospedaliera sembra interessata alla sicurezza dei pazienti solo dopo che si è verificato un evento avverso

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43. Le unità operative di questo ospedale lavorano insieme per assicurare al paziente l'assistenza migliore

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44. I cambi di turno in questo ospedale sono problematici per i pazienti

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**SEZIONE G: Numero di eventi** (errore, incidente o deviazione dalla norma/regolamento) riportati (da compilare SOLO se esiste, all'interno dell'unità operativa o dell'ospedale, un sistema ufficiale di segnalazione degli errori e degli eventi avversi)

45. Negli ultimi 12 mesi, quante segnalazioni ha compilato e inviato?

- ☐ 1. Nessuna segnalazione
- ☐ 2. da 1 a 2 segnalazioni
- ☐ 3. da 3 a 5 segnalazioni
- ☐ 4. da 6 a 10 segnalazioni
- ☐ 5. da 11 a 20 segnalazioni
- ☐ 6. oltre le 20 segnalazioni

**SEZIONE H: Informazioni di contesto**

Queste informazioni aiuteranno nell'analisi dei risultati dell'indagine.

46. Da quanto tempo lavora in questo ospedale?

- ☐ 1. Meno di 1 anno
- ☐ 2. da 1 a 5 anni
- ☐ 3. da 6 a 10 anni
- ☐ 4. da 11 a 15 anni
- ☐ 5. da 16 a 20 anni
- ☐ 6. oltre i 20 anni

47. Quanto tempo ha lavorato nell'attuale unità?

- ☐ 1. Meno di 1 anno
- ☐ 2. da 1 a 5 anni
- ☐ 3. da 6 a 10 anni
- ☐ 4. da 11 a 15 anni
- ☐ 5. da 16 a 20 anni
- ☐ 6. oltre i 20 anni
48. Di solito, quante ore settimanali lavora in questo ospedale?
   □ 1. meno di 20 ore settimanali □ 3. da 39 a 59 ore settimanali
   □ 2. da 20 a 38 ore settimanali □ 4. 60 ore o oltre

49. Qual è la sua posizione in questo ospedale? Selezioni la risposta che descrive meglio la sua posizione.
   □ 1. Infermiere □ 6. Fisioterapista
   □ 2. Medici □ 7. Laureato sanitario non medico
   □ 3. Farmacista □ 8. Tecnico sanitario
   □ 4. Dietista □ 9. OTA/OSS
   □ 5. Amministrativo □ 10. Altro, specificare

50. Nella sua posizione, di solito, ha interazioni o contatti con i pazienti?
   □ 1. Sì, di solito ho interazione diretta o contatto con i pazienti
   □ 2. NO, di solito non ho interazione diretta o contatto con i pazienti

51. Per quanto tempo ha lavorato nella sua attuale specialità o professione?
   □ 1. meno di 1 anno □ 4. da 11 a 15 anni
   □ 2. da 1 a 5 anni □ 5. da 16 a 20 anni
   □ 3. da 6 a 10 anni □ 6. oltre i 21 anni

SEZIONE I: Commenti personali
Si senta libero di scrivere qualsiasi commento sulla sicurezza del paziente, gli errori o il sistema di segnalazione degli eventi avversi all'interno dell'ospedale.

Grazie per aver completato il questionario
9.4 First part of the research survey

Età:
- Inferiore a 25 anni
- Compresa tra 25 e 35 anni
- Compresa tra 36 e 45 anni
- Compresa tra 46 e 55 anni
- Maggiore di 55 anni

Genere
- Donna
- Uomo

Ruolo attualmente ricoperto
- Coordinatore infermieristico
- Coordinatore tecnico
- Farmacista
- Infermiere
- Medico
- OSS
- Personale ausiliario
- Personale non sanitario
- Responsabile di UO / Caposezione
- Tecnico di Laboratorio / Anatomia Patologica
- Tecnico di Radiologia / Radioterapia / Medicina Nucleare
- Tecnico della Riabilitazione
- Altri professionisti sanitari non medici (Biologo, Dietista, Psicologo...)

Titolo di studio
- Licenza Media
- Diploma
- Laurea
- Specializzazione
- Dottorato di ricerca / PhD
- Non sono in possesso di un titolo di studio

Area di appartenenza: ________________________

Contratto di lavoro
- Contratto di lavoro dipendente
- Contratto libero professionale o altro contratto autonomo

Anni di esperienza
- Inferiore a 3 anni
- Da 3 a 6 anni
- Da 6 a 10 anni
- Da 10 a 15 anni
- Oltre 15 anni
### Relazione con il referente

Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

<table>
<thead>
<tr>
<th>Affermazione</th>
<th>Forte disaccordo 1</th>
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</tr>
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<tbody>
<tr>
<td>Il mio referente capisce le problematiche e i bisogni del mio lavoro</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Il mio referente riconosce il mio potenziale</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
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<td>⬜</td>
</tr>
<tr>
<td>Ho una buona relazione di lavoro con il mio referente</td>
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<td>⬜</td>
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### Coinvolgimento

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<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sono completamente calato nel mio lavoro</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Sono perseverante nel lavoro anche quando le cose non vanno bene</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
<td>⬜</td>
</tr>
<tr>
<td>Sono orgoglioso del lavoro che faccio</td>
<td>⬜</td>
<td>⬜</td>
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<td>⬜</td>
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<td>⬜</td>
</tr>
<tr>
<td>Sono felice quando lavoro intensamente</td>
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</table>
Formazione per la sicurezza dei pazienti. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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</tr>
</thead>
<tbody>
<tr>
<td>L’ospedale pone la giusta enfasi sull’importanza della formazione per la sicurezza dei pazienti</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Sono contento delle opportunità di formazione per la sicurezza dei pazienti messe a disposizione per me in questo ospedale</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Ci sono molte opportunità di formazione per la sicurezza dei pazienti messe a disposizione per me in questo ospedale</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>La formazione per la sicurezza dei pazienti che ho ricevuto fino ad ora mi ha aiutato a svolgere il mio lavoro in modo più sicuro per il paziente</td>
<td>●</td>
<td>●</td>
<td>●</td>
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<td>●</td>
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Procedure per la sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo. Nella mia unità:

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<tbody>
<tr>
<td>... ci sono procedure per la sicurezza dei pazienti per ogni attività</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
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</tr>
<tr>
<td>... le procedure per la sicurezza dei pazienti sono molto dettagliate</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>… le procedure per la sicurezza dei pazienti riguardano tutte le situazioni di rischio potenziale</td>
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<tr>
<td>… quando siamo sotto pressione, si decide di fare il lavoro più velocemente possibile, persino se ciò significa scendere a compromessi con la sicurezza dei pazienti</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>… le procedure per la sicurezza dei pazienti vengono Ignorate</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>… è accettato non curarsi della sicurezza dei pazienti</td>
<td>○</td>
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Risultati legati alla sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porto a termine le mie attività in modo sicuro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Mi assumo le responsabilità sulla sicurezza proprie del mio ruolo</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Nello svolgimento della mia attività, rispetto le procedure per la sicurezza</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Garantisco l’adesione alle procedure sulla sicurezza formalmente richieste</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Adesione alla sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

<table>
<thead>
<tr>
<th>Uso tutte le necessarie protezioni per svolgere la mia attività</th>
<th>Forte disaccordo 1</th>
<th>Disaccordo 2</th>
<th>Parziale disaccordo 3</th>
<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seguo correttamente le procedure per la sicurezza dei pazienti per svolgere la mia attività</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Assicuro il più alto livello di sicurezza dei pazienti quando faccio il mio lavoro</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
9.5 Second part of the research survey

Età:
- Fino a 35 anni
- Compresa tra 36 e 45 anni
- Compresa tra 46 e 55 anni
- Oltre 55 anni

Genere
- Donna
- Uomo

Ruolo attualmente ricoperto
- Responsabile UOS
- Responsabile UOS a valenza dipartimentale
- Responsabile UOC

Area di appartenenza: ______________________

Contratto di lavoro
- Contratto di lavoro dipendente
- Contratto libero professionale o altro contratto autonomo

Anni di esperienza
- Inferiore a 3 anni
- Da 3 a 6 anni
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Il mio referente è disposto ad accettare suggerimenti per migliorare la sicurezza dei pazienti</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Il mio referente incoraggia una comunicazione aperta sul tema della sicurezza</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Il mio referente innalza il livello di controllo se qualcuno viola le procedure che impattano sulla sicurezza dei pazienti</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Il mio referente tiene conto del rispetto delle procedure che impattano sulla sicurezza dei pazienti nella valutazione individuale dello staff</td>
<td></td>
<td></td>
<td></td>
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<td>Sono completamente calato nel mio lavoro</td>
<td>☐</td>
<td>☐</td>
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<tr>
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<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Ci sono molte opportunità di formazione per la sicurezza dei pazienti messe a disposizione per me in questo ospedale</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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</tr>
<tr>
<td>La formazione per la sicurezza dei pazienti che ho ricevuto fino ad ora mi ha aiutato a svolgere il mio lavoro in modo più sicuro per il paziente</td>
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Procedure per la sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo. Nella mia unità:

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<tr>
<td>... ci sono procedure per la sicurezza dei pazienti per ogni attività</td>
<td>✓</td>
<td></td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>… le procedure per la sicurezza dei pazienti vengono ignorate</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>… è accettato non curarsi della sicurezza dei pazienti</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>… non importa come viene svolta l’attività, basta che non ci siano incidenti</td>
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<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
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Risultati legati alla sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Forte disaccordo 1</th>
<th>Disaccordo 2</th>
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<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
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<tbody>
<tr>
<td>Porto a termine le mie attività in modo sicuro</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mi assumo le responsabilità sulla sicurezza proprie del mio ruolo</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nello svolgimento della mia attività, rispetto le procedure per la sicurezza</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garantisco l’adesione alle procedure sulla sicurezza formalmente richieste</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>
Adesione alla sicurezza del paziente. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uso tutte le necessarie protezioni per svolgere la mia attività</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>Seguo correttamente le procedure per la sicurezza dei pazienti per svolgere la mia attività</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>Assicuro il più alto livello di sicurezza dei pazienti quando faccio il mio lavoro</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
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</table>

Direzione ospedaliera e accreditamento. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>La direzione del mio ospedale promuove iniziative formative sul tema dell’accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>La direzione del mio ospedale verifica l’adesione agli standard di accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>La direzione del mio ospedale è disponibile ad ascoltarmi sui problemi legati al rispetto degli standard di accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>La direzione del mio ospedale mette in atto verifiche per valutare l’applicazione degli standard di accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>La direzione del mio ospedale organizza momenti di approfondimento sul sistema di accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
</tr>
<tr>
<td>La direzione del mio ospedale mi sollecita a segnalare le non conformità agli standard di accreditamento</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
<td>☀</td>
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Dimensione personale e accreditamento. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ritengo che partecipare ad iniziative di formazione sul sistema di accreditamento sia molto utile</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Penso che il rispetto degli standard di accreditamento garantisca la sicurezza del paziente</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Credo che il sistema di accreditamento sia nato per diminuire i rischi per il paziente</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Penso che le iniziative di valutazione degli standard di accreditamento siano utili per migliorare la sicurezza dei processi diagnostico assistenziali</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>Sono convinto che la conoscenza degli standard di accreditamento possa cambiare il modo di lavorare degli operatori</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Credo che la conoscenza dei requisiti di accreditamento abbia ridotto la possibilità di errori nel mio lavoro</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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Comportamenti e accreditamento. Per ogni affermazione, indichi il suo grado di accordo/disaccordo.

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<th>Parziale accordo 4</th>
<th>Accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partecipo alle iniziative formative che mi vengono proposte sul tema dell’accreditamento</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Mi tengo aggiornato sui requisiti di accreditamento</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Segnalo alla direzione del mio ospedale le non conformità agli standard di accreditamento</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Credo momenti di condivisione tra il mio staff sui temi dell’accreditamento</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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<th>accordo 5</th>
<th>Forte accordo 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sono sicuro di saper ben rappresentare la mia area di lavoro negli incontri con la direzione</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sono in grado di dare un contributo alla discussione sulle strategie che riguardano la mia attività</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sono sicuro di poter contribuire nella definizione degli obiettivi per la mia area di attività</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Al momento ritengo di avere un discreto successo nel mio lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>So identificare diverse modalità per raggiungere i miei attuali obiettivi di lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Attualmente, sto raggiungendo gli obiettivi che mi sono prefissato</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>In un modo o nell’altro, riesco solitamente a gestire i problemi di lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>La mia esperienza pregressa mi aiuta a gestire le difficoltà sul lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Credo di saper gestire più attività contemporaneamente connesse al mio lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Solitamente ho una attitudine positiva nei momenti di incertezza al lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sono sempre portato ad enfatizzare gli aspetti migliori del mio lavoro</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sono ottimista rispetto a ciò che mi potrà accadere nel mio lavoro</td>
<td>○</td>
<td>○</td>
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To who it may concern,

RE: Statement of contribution by Professor Yvonne Brunetto

The purpose of this statement is to summarise my involvement in the intellectual input of academic articles. I have co-authored numerous papers with Elisabetta Trinchero. However, she has led the idea development, and it has been my job to ensure that appropriate research design and protocols were used. I have been Elisabetta’s principal PhD supervisor, and as such, I have been involved in reviewing most of which she has written. I have also participated in brainstorming around instrument development, testing ideas (both theoretically and methodologically) and discussing research design. I can verify that she has led and undertaken much of the work required to successfully get a paper accepted at Academy of Management Conferences and in journals. The list of papers in which I have been involved include:


Regards,

Y. Brunetto

20/09/2017

To who it may concern,

RE: Statement of contribution by Dr. Ben Farr-Wharton
The purpose of this statement is to summarise my involvement in the intellectual input of academic articles. I have co-authored numerous papers with Elisabetta Trinchero. However, she has led the idea development, and it has been my job to ensure that appropriate method of analysis was used. The list of papers in which I have been involved include:


Regards,

Dr. Ben Farr-Wharton
9.8 The premise of the research: the 2015 AOM paper

The paper, submission #19110 titled “Psychometric properties of the Hospital Survey on Patient Safety Culture: Italian findings”, has been accepted and presented in a Divisional Paper session in the HCM Division at the 2015 Academy of Management Annual Meeting, that took place August 7-11 in Vancouver, BC, Canada. Divisional Paper sessions consist of papers with a common theme, with a session chair to run the session and to lead the discussion. Authors of the paper were: Elisabetta Trinchero, SDA Bocconi School of Management, and Ben Farr-Wharton, Southern Cross School of Business and Tourism. The paper is presented in its original design in the following pages.
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9.9 The first part of the research: the 2016 AOM paper

The paper, submission #15626 titled “A social exchange perspective for achieving safety culture in healthcare organizations”, has been accepted and presented in a Divisional Paper session in the HCM Division at the 2016 Academy of Management Annual Meeting, that took place August 5-9, in Anaheim, CA. Divisional Paper sessions consist of papers with a common theme, with a session chair to run the session and to lead the discussion. Author of the paper was Elisabetta Trinchero, SDA Bocconi School of Management. The paper is presented in its original design in the following pages.
A Social Exchange Perspective for Achieving Safety Culture in Healthcare Organizations

ABSTRACT

This paper used Social Exchange Theory (SET) and Cooper’s (2000) model to operationalize a comprehensive model of safety culture, and tests whether SET factors (supervisor-employee relationships and engagement) predict safety culture in a causal chain. Safety culture is operationalized using Cooper’s (2000) framework, comprising a psychological, behavioural and situational dimension. The model was tested using surveys from 643 healthcare employees working in an Italian hospital and analysed using Structural Equation Modelling. The findings indicate that supervisor-employee relationships and engagement accounted for over a fifth of psychological aspect of safety culture and almost two-fifths of the situational aspect of safety culture. Additionally, supervisor-employee relationships, engagement, psychological and situational dimension of safety culture explained almost half of the behavioural dimension of safety culture. Almost half of the safety behaviours of doctors, nurses and health technicians can be explained by the quality of the supervisor-employee relationship, their engagement, their feelings about safety (psychological dimension) and the quality of organizational policies, procedures and management involvement (situational dimension) in a healthcare setting. Hence, management needs to focus on ensuring effective workplace relationships between management and healthcare professionals to ensure engagement and, to shape beliefs and perceptions about safe working practices.

Keywords:

social exchange theory; safety culture; healthcare organizations
INTRODUCTION

The cost of patient and employee safety breaches continues to be a problem for hospital managers, and therefore they are concerned with addressing those safety culture issues that increase the potential for patient morbidity and mortality (Colla et al. 2005). Unlike other high reliability organization’s (HROs) (such as the nuclear or aviation industries) that control safety by rigorous process planning, hospitals use a patient-centered model, which is far more difficult to control because humans are less predictable than capital equipment (Resar 2006). Additionally, workloads are high in many hospitals, which potentially can compromise patient safety irrespective of the quality of organizational safety processes in place (Abdelhadi & Drach-Zahavy 2012). Hence, the World Health Organization (WHO) is driving a global initiative aimed at reducing clinical errors and workplace/patient safety accidents (www.who.int/patient-safety).

The assumption is that if a positive safety culture can be embedded, then the result will be a significant reduction in errors and accidents (Sorra & Nieva 2004). Although the relevance of safety culture for high-risk organizations is increasingly becoming evident, at the turn of the twenty-first century Guldenmund (2000, p. 216) argued that “the concept still has not advanced beyond its first developmental stages” and a decade later, the situation had still not changed much (Vogus, Sutcliffe & Weick 2010). There are numerous reasons. One problem is terminology. For example there is literature “debating” the similarities and differences between safety climate and safety culture, and the terms are used interchangeably (i.e. Choudhry, Fang & Mohamed 2007b; Cole, Stevens-Adams & Wenner 2013; Flin 2007; Zohar & Polachek 2014). Safety climate is defined by Zohar and Luria (2005) as employees’ perception of safety policies, processes and practices. In contrast, the safety culture of an organization is “the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the
commitment to, and the style and proficiency of, an organization’s health and safety management” (ACSNI 1993, p. 23). As such safety climate is a measurable component of safety culture, comprising management behaviour, safety systems, and employee overall perceptions of safety (Kuenzi & Schminke, 2009). Also Zohar and Polachek (2014), argue that the definition of safety culture must encompass data about both employees’ safety compliance behaviour and their participation in safety practices.

A second issue in adequately capturing safety culture is the lack of empirically tested models and instruments. Choudhry, Fang and Mohamed (2007b, p. 996) argued that “the concept of safety culture has not developed theoretically from the organizational culture”, and as a consequence, previous conceptualizations tend not to cover important aspects of culture. Hence, there is a need to develop new models and/or empirically test established models to determine their usefulness in measuring safety culture in hospitals.

In particular, a review of the literature indicates that no safety model to date predicts safety culture in a causal chain; instead past research has identified some of the important variables and potential relationships (Vogus, Sutcliffe & Weick 2010). Consequently, in this paper, Social Exchange Theory (SET) is used to conceptualize how workplace relationships impact safety culture. SET assumes that there are tangible and intangible positive benefits and outcomes for all stakeholders from effective workplace relationships (Cropanzano & Mitchell 2005). Some researchers (Hofmann, Morgeson & Gerras 2003) identified that a management factor - Leader Member Exchange (LMX) - was a predictor of safety outcomes. Similarly, research by Nahrgang, Morgeson, and Hofmann (2011) identified that another SET factor - employee engagement - is also a pivotal factor affect safety culture. Engaged employees use effective safety practices whereas under-resourced employees, who lack autonomy in the workplace, are far less likely to embrace an effective safety culture. However, whilst previous research identified the important
role that individual SET factors play in affecting different aspects of safety culture, no comprehensive predictive model has been developed. On the other hand, it seems likely that a SET framework could contribute significantly to building a better understanding of safety culture; however, the link between the quality of workplace relationships and safety outcomes remains relatively unexplored (Vogus, Sutcliffe & Weick 2010).

Similarly, within the literature on high reliability organizations, some models of safety culture have been proposed but none have been operationalized. We build on the Cooper’s (2000) model of safety culture, which is in turn based on Bandura’s (1986) model of reciprocal determinism (which means that employee’s work practices are influenced by an interplay of management policies, directives and role modelling as well as the environment in which they operate and vice versa). Consequently, the model comprises three dimensions: psychological, behavioural and situational, which Cooper (2000) argues captures safety culture. In particular, the psychological aspect of safety captures the socio-emotional (feelings) of employees, the behavioural aspect captures the safety behaviours, and the situational aspect captures the policies, procedures, management structures and responsibilities related to safety outcomes. This model has received some endorsement from other researchers who have used aspects of it to measure safety cultures (Zohar & Polachek 2014).

This paper uses two theoretical frameworks – SET and Cooper’s (2000) model to operationalize and test a new comprehensive model of safety culture – and test whether SET factors predict safety culture in a causal chain. The research question guiding the study is:

*RQ1: What are the impacts of SET factors - LMX and engagement - on the psychological, behavioural and situational aspects of safety culture?*

This comprehensive model of safety culture is tested with healthcare settings in Italy. As such, the study examines the safety culture of clinical healthcare professionals: doctors, nurses
and allied health and administrative staff. Additionally, the study employs structural equation modelling (SEM) to ensure robust empirical testing of the data and an evidence-based useable model for healthcare managers to use.

**BACKGROUND**

**Applying Social Exchange Theory to safety culture**

SET is a theory that researchers argue has the potential to explain most employee practices in the workplace (Cropanzano & Mitchell 2005). In theory, effective social interactions between management/supervisors and employees build trust and positive socio-emotional feelings that in turn result in mutually beneficial reciprocity in behaviours. Employees benefit from the extra resources, information, autonomy, and respect given to them by management; management benefits because of the support they receive from employees for their decision-making and the organization benefits from increased efficiency and effectiveness resulting from high levels of cooperation amongst colleagues (Shore et al. 2011). Two SET variables are included in the comprehensive model: LMX and employee engagement.

**Leader-Member-Exchange**

A high quality LMX relationship can be conceptualized in terms of mutual trust, friendship and respect (Uhl-Bien & Maslyn 2003). Such relationships form because of positive, trust-building experiences between dyads in the workplace, and over time a critical mass of high LMX relationships expands all over a workplace so that everyone benefits (Scandura, T. A. & Pellegrini 2008). The basis of LMX is that (Dulebohn et al. 2012, p. 1744, p. 1744): “If leaders are seen as rewarding followers based on their performance, and stimulating them to perform beyond expectations with transformational leadership, a constructive relationship with their followers is very likely to emerge. In addition to insights on LMX quality, the results demonstrated that most of the variance in outcomes was explained through the mediating role of LMX.” In terms of
safety, it is imperative that supervisors provide leadership in relation to setting the expectations of employee safety practices. Numerous authors have examined and found that safety leadership was essential for ensuring employee safety outcomes (Hofmann, Morgeson & Gerras 2003; Mearns & Reader 2008; Michael et al. 2006). Hofmann, Morgeson and Gerras (2003) found that LMX acted as a mediator between the organizational management’s goals and policies, and employee safety behaviour. Moreover, they found that LMX had a bigger effect compared with safety communication in predicting safety outcomes. Also, Fernandez-Muniz, Montes-Peon, and Vazques-Ordas (2007) found that managers commitment to safety, enhances safety performances.

**Engagement**

There is increasing evidence that engaged employees are desirable by organizations because they work hard and enthusiastically in the job, and in a meaningful way (Macey, Schneider, Barbera & Young 2009; Slåtten & Mehmetoglu 2011). It is management’s responsibility to inform, educate, train and performance-manage employees about organizational priorities and procedures as well as organizational expectations of performance and behaviours: as a consequence, a strong predictor of engagement is LMX (Brunetto et al. 2014). We expect to replicate this finding in this study (H1). SET researchers conceptualize employee engagement as a function of workplace relationships (Brunetto et al. 2014; May, Gilson & Harter 2004), whereas other researchers mainly from the psychology discipline conceptualize burnout of employees at the opposite end of a continuum to engagement. Using a psychological theoretical perspective, Nahrgang, Morgeson, and Hofmann (2011) identified that high job demand (involving high risks and hazards, physical demands, and complexity) was inversely linked to engagement and directly linked to burnout, whereas a high level of job resources (knowledge, autonomy, supportive environment: social support, leadership, safety climate) was positively linked to engagement and negatively linked to burnout. Additionally, they also found that burnout was associated with
accidents, injuries, adverse events, and unsafe behaviour. Also, Vinodkumar and Bhasi (2010) in their research found that safety knowledge and safety motivation mediate the impact of safety training and that high management commitment was associated with high employee safety compliance, and high employee involvement increased participation in safety activities. We therefore expect that high employee engagement will be associated with high situational behavioural and psychological aspects of organizational culture.

**Coopers’ model of safety culture**

As stated, Coopers’ (2000) model of safety culture argues that safety culture comprises three dimensions: psychological (capturing employees’ attitudes and perceptions about safety policies), behavioural (capturing “observable ongoing safety-related behaviours”), and situational (capturing “safety management system audits/inspections”) category of factors. Cooper (2000) argued that in combination, the three dimensions provided a means of measuring and benchmarking safety culture across industries. However, the long list of hospitals with poor safety outcomes across the globe and the mounting pressure from WHO to address patient safety concerns means that the real issues concerning adopting safety practices must be examined. Embedding safety practices is costly and challenges existing organizational and professional cultures. Most hospitals in OECD countries now have appropriate policies related to safety, hence, if that was all that was required to achieve safety outcomes then, patient safety would no longer be a problem in most countries. However, there is a difference between policy and practice. Those who manage hospitals face a conflict between competing goals (safety outcomes - which are initially resource intensive - versus high profits/cost reduction), and have to make choices about the extent to which they resource both compliance of safety procedures whilst still wanting employees to report and learn from mistakes or pay rising patient insurance claims. Zohar (2010) argues that the solution is for active management involvement in determining safety
priorities and subsequent managerial procedures and actions, whilst still being open to understanding that employees are human with human fragilities and limits and therefore procedures can go wrong. Based on Zohar’s (2010) assumptions about somewhat conflicting managerial priorities and professional cultures, this paper operationalizes Cooper’s (2000) model of safety culture for hospitals as part of a comprehensive model of safety culture.

In terms of operationalizing the situational dimension, (encompassing policies, procedures, management directives related to safety outcomes) the research was guided by Nieva and Sorra (2003, p. 9), who argued that “management assessments of patient safety policies and practices in their organizations … [were] … represented by formal policies and standard operating practices… provid[ing] the leadership in healthcare organizations with information about the status of official organizational practices”. Similarly, Katz-Navon, Naveh and Stern (2005) argued that the situational dimension must capture employees’ perceptions about the depth and breadth of details about safety procedures (that is, is it limited to specific processes or are there formal safety procedures evident across all organizational activities?) and Meyer, JP, Allen and Smith (1993) argued that managerial goals and priorities were evident by examining their commitment to employee training about safety. Also, DeJoy et al. (2004) found that three factors of safety climate studied in relation to accident rates were a) safety activities of management and safety personnel, b) anticipation of hazards and c) safety training and they found that the better their safety climate, the lower was their accident rates. These findings confirm that safety procedures and training have been identified as two of the key factors affecting safety and therefore are included within the situational dimension of safety culture. Importantly, the situational dimension provides the platform on which the behavioural and psychological aspects of safety culture are built. This means that employee attitudes and behaviour result from management policies, procedures and funding for safety training in line with previous research.
findings (i.e. DeJoy et al, 2004; Zohar, 2010).

In terms of operationalizing the psychological aspect of safety (capturing employees’ attitudes and perceptions about safety policies), the key variable identified as predicting safety is Managerial Priority of Safety (Katz-Navon, Naveh & Stern 2005), which captures whether the attention and activities of supervisors is evidence that “the talk matches the walk” that safety has their high priority. Unless employees perceive that the supervisors have safety as a high priority, they will not be motivated to act safely themselves. Hence Choudhry, Fang and Mohamed (2007b, p. 1000) summarize the point by arguing that “while safety culture is about good safety attitudes, it is also about good safety management established by organizations” and therefore a comprehensive measure of safety culture must include employee’s perceptions of supervisors’ safety priorities. We argue that the psychological aspect of safety culture predicts the behavioural aspect of safety culture because past researchers argue that management priorities significantly impact the safety behaviour of employees (i.e. Choudhry et al, 2007; Katz-Navon et al, 2005), although, this needs to be tested in a healthcare setting.

In terms of operationalizing the behavioural aspect of safety culture (capturing the actions and behaviour related to safety) the key variables are Safety Compliance Behaviour (Neal & Griffin 2006) (which measures the extent to which the core activities of healthcare workers adhere to safe working practices - such as washing hands before handling each patient) and In-role safety Performance (Williams & Anderson 1991) (which captures the extent to which the tasks and behaviours of healthcare workers meets organizational expectations of in-role performance). Neal and Griffith (2006) argued that employee safety behaviour, including discretionary safety activities was a function of the extent to which they believed that the organization expected and rewarded exemplar safety practices.

Together the three aspects of safety culture that capture many of the important activities
impacting patient safety. The missing ingredient from past models has been the interaction of SET factors and Cooper’s (2000) safety culture dimensions. Figure 1 represents the interactions of SET factors and safety culture dimensions. The following hypotheses capture the paths from SET factors to safety culture factors.

H1. High LMX is associated with high employee engagement
H2. High LMX is associated with high situational safety culture
H3: High LMX is associated with high psychological safety culture
H4: High LMX is associated with high behavioural safety culture
H5. High employee engagement is associated with high situational safety culture
H6: High employee engagement is associated with high psychological safety culture
H7: High employee engagement is associated with high behavioural safety culture
H8: High situational safety culture is associated with high psychological safety culture.
H9: High situational safety culture is associated with high behavioural safety culture.
H10: High psychological safety culture is associated with high behavioural safety culture.

These hypotheses are tested using structural equation modelling, as discussed in the next section.

METHODS

Data were collected using a survey-based, self-report strategy during 2015. The emerging patterns of data were then compared with the findings of previous research.

Sampling

Data for this study was collected from 642 clinical employees working in one private Italian acute care hospital. The survey was administered online, and, of the 704 survey submitted by doctors, nurses and medical technician staff, 8% were not fully completed and these entries were deleted. Of 642 clinical staff, 246 were nurses, 226 were doctors, and 168 were health
technicians and primary allied health staff.

**Instruments**

The measures were from the extant literature and presented using statements to be rated on a 6-point Likert-type scale, with 1 = strongly disagree, ranging to 6 = strongly agree. Satisfaction with the quality of the supervisor-nurse relationship was measured using the 7-item unidimensional scale (LMX-7), developed by Graen and Uhl-Bien (1995). The first item of this scale was removed to enhance overall model fit, leaving a composite reliability coefficient of .95 and an average variance estimate of .76. Engagement was measured using four items from Schaufeli and Bakker (2003) original nine-item. The reduced scale has reasonable internal reliability as indicated by the composite reliability coefficient of .88 and an average variance estimate of .65. The situational component of safety culture was captured by three of four-item Katz-Navon, Naveh, and Stern (2005) safety procedures scales adapted from Brunsson and Jacobsson (2000) and employee’s satisfaction with (safety) training (Meyer et al, 1993). As a higher-order variable the combined scale has reasonable internal reliability as indicated by the composite reliability coefficient of .77 and an average variance estimate of .62. The psychological component of safety culture was captured using Katz-Navon, Naveh, and Stern (2005) seven-item priority of safety scale adapted from Zohar (2000). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .92 and an average variance estimate of .74. The behavioural component of safety culture was captured using a high-order factor that combined safety compliance scale (Neal & Griffin, 2006) and in-role (safety) performance (Brunetto et al. 2015). The scale has reasonable internal reliability as indicated by the composite reliability coefficient of .93 and an average variance estimate of .87. The items and reliabilities per construct are attached in the Appendix 1.
Demographics, sample adequacy & model fit assessment

The sample comprised 417 females and 225 males (=642), of which 92 (13.3%) had been in the job for less than three years, 100 (15.6%) had been in the job for between three and six years, 143 (22.3%) had been in the job for between six and ten years, 185 (28.8%) had been in the job between ten and fifteen years and 122 (19%) had been in the job more than fifteen years. Common methods variance was examined using Harman’s Single Factor Test. One factor was explained by 32% of the variance, indicating that there is a low chance of common method bias. As the analysis utilized higher-order constructs in the final model, reliability and model fit was assessed in the lower-order structure model, higher-order structure model, and in the final measurement model. The model fit for the lower-order model was good, with the CMIN over degrees of freedom (CMIN/DF) at 2.263 (acceptable under 5), the goodness of fit (GFI) index at .921 (acceptable over .9), the corrected fit index (CFI) at .974 (acceptable over .9), and RMSEA at .044 (good under .05, acceptable under .08). Similarly, the higher-order model was equally acceptable, with CMIN/DF at 2.293, GFI at .919, CFI and .973 and RMSEA at .045. The final, measure model was acceptable with CMIN/DF at 2.230, GFI at .915, CFI at .970 and RMSEA at .044.

RESULTS

This paper used a SET and Cooper’s model to operationalize and test a new comprehensive model of safety culture. In particular, the study tested and found that SET factors (LMX and employee engagement) did predict safety culture in a causal chain. In particular, it was found that together LMX and engagement accounted for over a fifth of psychological aspect of safety culture and almost two-fifths of the situational aspect of safety culture. Additionally, LMX, engagement, psychological and situation dimensions of safety culture explained almost half of the behavioural dimensions of safety culture. This means that almost half of the safety behaviours
(as evident in their work practices) of doctors, nurses and medical technicians can be explained by the quality of LMX, their engagement in the job, their feelings about safety (psychological dimension) and the quality of organizational policies, procedures and management involvement (situational dimension) in a healthcare setting.

Table 1 - Correlation Analysis

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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</thead>
<tbody>
<tr>
<td>1. LMX</td>
<td>4.46</td>
<td>1.14</td>
<td>1</td>
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<tr>
<td>2. Employee Enga</td>
<td>4.57</td>
<td>1.00</td>
<td>.35</td>
<td>.10</td>
<td>.35**</td>
<td>.47**</td>
<td></td>
<td></td>
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<tr>
<td>3. Situational Aspects</td>
<td>4.46</td>
<td>.91</td>
<td>.35</td>
<td>.35**</td>
<td>.47**</td>
<td></td>
<td></td>
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<tr>
<td>4. Psychological Aspects</td>
<td>4.74</td>
<td>1.16</td>
<td>.39</td>
<td>.30**</td>
<td>.30**</td>
<td>.30**</td>
<td></td>
<td></td>
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<tr>
<td>5. Behavioural Aspects</td>
<td>5.13</td>
<td>.64</td>
<td>.24</td>
<td>.43**</td>
<td>.51**</td>
<td>.41**</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Gender</td>
<td>1.35</td>
<td>.48</td>
<td>.06</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7. Experience</td>
<td>6.94</td>
<td>1.27</td>
<td>.09</td>
<td>.04</td>
<td>.04</td>
<td>.04</td>
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</table>

N=642, *p < 0.05, **p < 0.01, ***p < 0.001

The findings indicate that all hypotheses are supported (See Figure 1).

The figure shows the relationships between Leader-Member Exchange, Employee Engagement, Safety Culture: Psychological aspects, Safety Culture: Behavioural aspects, Safety Culture: Situational aspects, Safety Procedures, Safety Training, In-role Safety Performance, Safety Compliance, Gender, and Experience. The correlations are indicated by the arrows and correlation coefficients. The figure and correlation analysis provide evidence for the hypotheses supported in the study.
Researchers have had a poor history of comprehensively empirically capturing and testing safety culture in a causal chain. However, this research is only possible because of the growing body of studies that have attempted to test individual aspects of safety climate, and more recently safety culture. In particular, using an LMX framework, this paper builds on the work of Hofmann et al (2003), Means and Reader (2008), Michael et al (2006) and Vogus, Sutcliffe and Weick (2010) in relation to LMX, and Nahrgang, Morgeson and Hofmann (2007) and Vinodkumar and Bhasi (2010) in relation to employee engagement.

Additionally, this paper builds on Cooper’s model of safety culture, which in turn rests on a body of research focusing on either the psychological dimension (Katz-Navon et al, 2005; Choudhry et al, 2007) or the situational dimension (DeJoy et al, 2004; Zohar, 2010) and/or the behavioural dimension (Neal & Griffin 2006). Hence, the first contribution of this paper is that it has empirically developed and tested a comprehensive model of safety culture that clearly identifies a causal chain for health care managers to follow so as to embed an effective safety culture.

The second contribution of this paper is in developing/modifying existing instruments to adequately capture the concepts identified in previous safety research. In particular, the LMX instrument was modified based on a review of the safety literature; the situational component of safety culture was obtained by combining and testing a reduced scales form of Katz-Navon et al (2005) formal safety procedures scale and employee’s satisfaction with safety training (Meyer, JP, Allen & Smith 1993); the psychological component of safety culture was obtained by modifying an existing measure of priority of safety (Katz-Navon, Naveh & Stern 2005) and the behavioural component of safety culture was obtained by testing and modifying a reduced scale from safety compliance (Neal & Griffin 2006) and developing a new In-role Safety Performance instrument. These instruments were used to firstly develop higher order factors, which were then robustly tested using SEM.
The limitations of the research are that self-report surveys can cause common method bias, although, Spector et al. (2004) argues that the self-reporting method is legitimate for gathering data about employees’ perceptions, as long as the instrument reflects a comprehensive review of literature and pattern-matching is used to support interpretation of the data. Also, as stated, the Harman’s ex-post one-factor test was used to determine if there was a common method bias (Podsakoff et al. 2003) and in this case one factor explained 32% of the variance, suggesting a low chance of common method bias. Additionally, generalizability will improve as this model in tested in other countries to ensure that the Italian healthcare context was not an aberration.

**IMPLICATIONS**

The findings from this paper provide healthcare managers with an empirically robust model for examining safety culture within hospitals. The model also provides a roadmap for strategically embedding effective safety behaviour. The roadmap identifies that effective workplace relationships between supervisors and healthcare professionals are the platform on which on all other safety structures and processes are embedded. This means that simply overlaying official safety processes on top of poor workplace relationships between supervisors and employees is unlikely to be successful because supervisors do more than manage; they also role model appropriate safety behaviour and fill in the vital non-verbal clues as to the importance of safety to the organization. Based on a mixture of these tangible and intangible messages, employees either engage in a productive and energetic manner or slowly dis-engage over time (Brunetto et al. 2014). Simply ensuring the situational dimension of safety culture (official safety procedures and training) is evident in an organization is not enough. It requires the combined impact of an effective LMX, which in turn promotes engaged professionals in addition to official safety procedures and training (situational dimension of safety culture) and official managerial safety priorities (psychological
dimension of safety culture) to promote appropriate safety behaviour (behavioural dimension of safety culture) necessary to significantly reduce patient and employee safety breaches that presently compromise patient morbidity and mortality. The evidence shows that embedding an effective LMX lays the foundations for engaging employees, and promoting the situational and psychological dimensions of safety culture, which in turn explains almost half of employee safety behaviours in hospitals. Hence, if hospitals follow this roadmap, they will be in a position to ensure safe behaviours of their professional staff.

**APPENDIX 1 - Factor loading per item**

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
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<tbody>
<tr>
<td>LMX</td>
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<tr>
<td>I have enough confidence in my supervisor that I would defend and justify his / her decisions if he / she were not present to do so</td>
<td>.904</td>
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<tr>
<td>My supervisor recognizes my potential</td>
<td>.898</td>
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<tr>
<td>My supervisor would be willing to help in her / his own time</td>
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<td>My supervisor understands my work problems and needs</td>
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<td>I have a good working relationship with my supervisor</td>
<td>.845</td>
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<td>My supervisor is willing to use her / his power to help me to solve work problems</td>
<td>.821</td>
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<tr>
<td>Employee Engagement</td>
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<td>I am proud of the work that I do</td>
<td>.888</td>
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<td>I am immersed in my work</td>
<td>.840</td>
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<td>I feel happy when I am working intensely</td>
<td>.822</td>
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<td>I persevere, even when things do not go well</td>
<td>.688</td>
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<td>Safety Culture: Situation Aspect</td>
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<td>Safety Training</td>
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<tr>
<td>I am happy with the training opportunities provided for me in this hospital on patient safety issues</td>
<td>.914</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>There are lots of training opportunities provided for me in this hospital on patient safety issues</td>
<td>.913</td>
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<tr>
<td>My hospital gives me lots of opportunities to develop my full potential</td>
<td>.895</td>
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<tr>
<td>The training on patient safety issues I have received so far has helped me to do my job more safely</td>
<td>.870</td>
<td></td>
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<tr>
<td>The hospital places the right amount of important on training patient safety issues</td>
<td>.826</td>
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<td>Safety Procedures</td>
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<td>In my unit, the safety procedures are easy to understand</td>
<td>.954</td>
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<td>In my unit, the safety procedures are extensive</td>
<td>.940</td>
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<tr>
<td>In my unit, the safety procedures relate to all work-related issues</td>
<td>.898</td>
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<tr>
<td>Safety Culture: Psychological Aspects</td>
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<tr>
<td>Safety Priority*</td>
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<tr>
<td>In my unit, safety rules and procedures are ignored</td>
<td>.936</td>
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<td>In my unit, human resource shortage undermines safety standards</td>
<td>.861</td>
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<td>In my unit, ignoring safety is acceptable</td>
<td>.832</td>
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<td>In my unit, whenever pressure builds up, the preference is to do the job as fast as possible, even if that means compromising on safety</td>
<td>.801</td>
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<td>Safety Culture: Behavioural Aspects</td>
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<td>In-role safety performance</td>
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<td>I perform safety tasks that are expected</td>
<td>.928</td>
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<td>I meet formal safety performance requirements of my job</td>
<td>.907</td>
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<td>I complete my work tasks safely</td>
<td>.842</td>
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<td>I fulfil safety responsibilities specified in my job description</td>
<td>.827</td>
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<td>Safety Compliance</td>
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<td>I ensure the highest levels of safety when I carry out my job</td>
<td>.910</td>
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<td>I use all the necessary safety equipment to do my job</td>
<td>.886</td>
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<tr>
<td>I use the correct safety procedures for carrying out my job</td>
<td>.812</td>
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*Safety Priority was inverted in analysis
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