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Cadden T, Marshall H, Humphreys P, Yang Y. [Old Habits Die Hard: Exploring the Effect of Supply Chain Dependency and Culture on Performance Outcomes and Relationship Satisfaction](#). *Production Planning and Control* 2015, 26(1), 53-77.

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**Date deposited:**

13/03/2018



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# **Old Habits Die Hard: Exploring the Effect of Supply Chain Dependency and Culture on Performance Outcomes and Relationship Satisfaction**

## **Abstract**

This paper examines the effect of dependency and culture on relationship performance and satisfaction in an interdependent supply chain. Several studies have empirically tested the relationship between dependence and outcomes but none, to our knowledge, have included the multifaceted construct of organisational culture as a mediating variable. This paper takes a theory-building, longitudinal case-study approach using mixed methods to understand the dynamic between dependence and culture and proposes that interdependence will lead to collaborative organisational cultures over the long term (over five years) and this will positively influence relationship performance and satisfaction. However, our study finds that the rhetoric does not match the reality: interdependence in a supply chain relationship does not necessarily lead to a collaborative culture. It appears that firms use the term “collaborative” as another term for risk management, are still wedded to transactional mechanisms rather than relational mechanisms, and are opportunistic in their behaviour when the opportunity presents itself. We also find that collaborative culture is more apparent at the operational level but missing at the strategic level. When a true collaborative culture is absent, satisfaction and performance decline; when it is present, these increase. We propose that when a culture of true collaboration exists this is more stable over time but when this is missing the culture fluctuates between relational and transactional practices.

**Key words:** supply chain relationships, dependence, organisational culture, performance, satisfaction

## **1. Introduction**

In an era where intense global competition is normal for many industries, there is a need for organisations to operate as efficiently and effectively as possible (Chen and Paulraj 2004; Nyaga et al. 2010). In order to achieve much needed competitive advantage, one area of attention is the relationship between buyers and suppliers (Phillips et al., 2006).

Organisations, therefore, increasingly view the buyer-supplier relationship as a key mechanism to achieve and sustain competitive advantage; with a reduction in the number of firms in their supply base and a fundamental change in the nature of their relationships with suppliers (Agrawal and Nahmias 1997; Christopher 2000; Co and Barro 2009; Kim et al. 2009). High levels of relationship satisfaction and positive performance outcomes such as increased quality levels, shorter order cycle times, increased percentage of on-time delivery, increased sales, and increased profits result from successful buyer-supplier relationships (Barringer and Harrison 2000; Jonsson and Zineldin 2003; Prahinski and Benton 2004).

Reducing supply bases has meant that many firms have moved away from arms-length, adversarial relationships with characteristics of a short-term, transactional, cost focus; to collaborative relationships with characteristics of high levels of openness, trust, communication, shared risks and rewards and a long-term orientation (Cousins et al. 2002; Sako 1992; Lamming et al. 2004). Mutual cost, service, and quality advantages coupled with high levels of joint relationship satisfaction in collaborative supply chain relationships have been cited by many authors (Cousins 2002; Krause et al. 2000; Lamming et al. 2004; Nyaga

et al. 2010; Rokkan et al. 2003; Weingarten et al. 2011). Yet, many supply chain relationships are still not realising these perceived benefits (Moberg et al. 2003; Sividas and Dwyer 2000).

It is argued in this paper that a key reason why collaborative relationships do not result in maximised supply chain performance outcomes and high levels of supply chain relationship satisfaction is due to a lack of cultural compatibility between the integrating firms (Barringer and Harrison 2000; Cartwright and Cooper 1993; Fawcett et al. 2008; Pothukuchi et al. 2002; Weber and Camerer 2003. As Cartwright and Cooper (1993, 60), report:

‘The degree of cultural fit that exists between the combining organizations is likely to be directly correlated to the success of the combination.’

Collaborative relationships thrive in supply chain environments where there are high levels of interdependence resulting in high levels of information sharing, cooperation, trust and commitment (De Leede and Looise 2001; Weingarten et al. 2011). The structure and level of this interdependence is important in supply chain relationships as these affect the satisfaction and performance of the relationship (Ryu et al. 2007). Previous studies have shown that dependence in relationships generate specific behaviours (Narasimhan et al. 2009). These behaviours in turn determine the performance outcomes and satisfaction of the relationship (Griffith et al. 2006; Potukuchi et al. 2002; Saxton 1997; Zhang et al. 2009).

Looking through the social exchange theory (SET) lens, where the guiding force of the relationships is the satisfaction of both parties (Emerson 1976), this study investigates and attempts to further understand how to create a supply chain culture of high performance outcomes and high levels of relationship satisfaction. Supply chain relationships should thrive in a collaborative environment with high levels of interdependence (Lonsdale 2001; Narasimhan et al. 2009) and therefore this study is conducted in such an environment.

The central contribution of this paper is threefold; first, the study looks beyond the dyad to the buyer, the tier 1 supplier and the tier 2 supplier using a longitudinal case study approach with mixed methods; second, the study is longitudinal (over 5 years) which is an ideal yet underused method to investigate cultural mechanisms (Cadden et al. 2012; Cousins et al. 2008; Narasimhan et al. 2009); and third, as many authors are calling for increased supply chain empirical research using emergent theories, such as SET (Cadden et al. 2012; Cousins and Menguc 2006; Liu et al. 2009) this study takes a theory-building perspective by using this complementary and contemporary theory in an applied setting. Social exchange theory incorporates social network governance (Cousins and Menguc 2006; March 1991; Liu et al. 2009) and relational governance (Dyer and Singh 1998; Eisenhardt and Schoonhoven 1996 Liu et al. 2009; Narasimham et al. 2009). Throughout this study, SET will be used as a standard term when referring to these complementary theories.

The paper is presented as follows: the literature section is presented in the next section, followed by the conceptual model and relevant propositions. The methodology section is then outlined, with the data analysis and results sections following. Finally, a detailed discussion and conclusions section completes the paper.

## 2. Literature Review

The literature review section is organised into four main sections: power and dependency in supply chain relationships; dependency and organisational culture; organisational culture and supply chain performance; and organisational culture and supply chain satisfaction. These will then be used to create the research propositions.

### 2.1 Power and Dependency in Supply Chain Relationships

Power is widely reported as a fundamental issue within supply chain management research (Gaski 1984; Narasimhan et al. 2009). To fully understand power we have to understand the concept of dependency. In supply chain management, where one party is heavily reliant on another party (upstream or downstream), power and dependency are apparent (Lamming et al. 2004; Lonsdale 2001; Narasimhan et al. 2009). For example, a buyer, which represents a high percentage of a supplier's business, is likely to assert control and power over the dependent supplier. This is a scenario frequently reported in the retail supply chain where major supermarkets dominate resulting in cost pressures exerted on the supply base.

In this environment of power and dependency, transaction cost theory (TCT) prevails (Williamson 1979). Where buyer dependency is high and supplier dependence is low, supplier power exists and opportunistic behaviour is present. The opposite is also true; when the supplier dependency on the buyer is high but the buyer dependency on the supplier is low, buyer power exists and the buyer will seek to use this power to influence the supplier's behaviour. However, if the level of dependence on each other is high, interdependence exists. It is in this environment that a more collaborative culture can form and develop (see Figure 1).

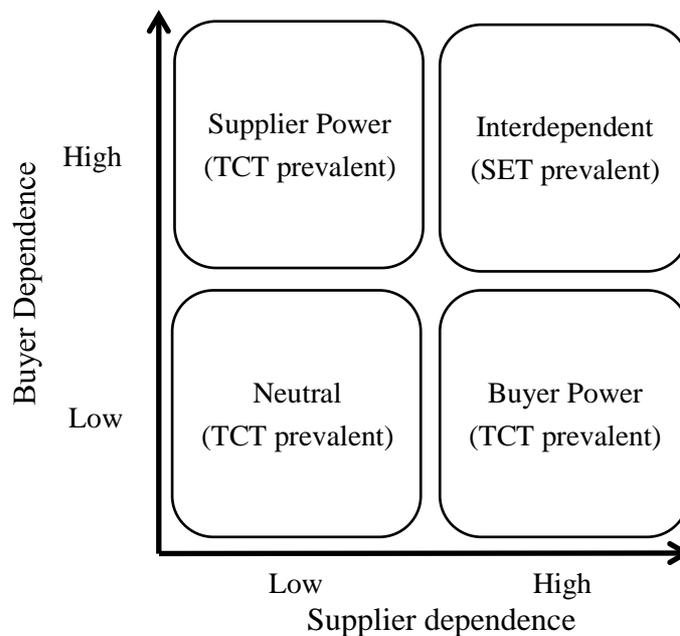


Figure 1. Buyer-supplier dependency forms.

TCT is founded on two key assumptions; bounded rationality and opportunism. Both of these assumptions have a profound effect on supply chain management relationships. Bounded rationality suggests that decision makers will make decisions based on incomplete information and knowledge and are influenced by their own value and belief system, shaped by both dispositional and situational environments (Simon 1957; Williamson 1975). Opportunism asserts that decision-makers will seek to maximise outcomes based on their own self-interest. In supply chain management research, firms will seek to reduce the level of exposure to opportunism to minimise this threat. Firms that hold high levels of power tend to exhibit high levels of opportunistic behaviour: In other words, '*self-interest seeking with guile*' (Williamson 1979, 234).

TCT has underpinned much supply chain management research since the early 1990s. At that time, purchasing was a transaction-based function (McIvor and McHugh 2000) and relationships tended to be adversarial or arms-length (Lamming et al. 2004; Phillips et al. 2006; Sako 1992). Relationship characteristics of short-term focus, cost focus, and transaction orientation prevailed.

This traditional TCT approach is still widely referred to within supply chain management research, yet, an acknowledgement of the limitations of this approach, including the omission of 'soft factors' such as trust and relationships, are reported (Burgess et al. 2006; Cousins 2002; Liu et al. 2009). There are calls for researchers to consider more contemporary approaches, such as SET, in the search for sustained competitive advantage (Cousins et al. 2008; Narashamin et al. 2009; Liu et al. 2009)

SET proposes that people or organisations interact to gain rewards as a result of the interaction (Emerson 1976). It is founded on the principle that there is mutual dependence within exchange relationships (Emerson 1976). In a supply chain sense, relationships are intricate and interdependent: Each partner in the supply chain has the ability to exert control over the other participant. For example, a buyer may represent a significant percentage of a supplier's business and in return the supplier may have intellectual property rights or customer-specific components or products.

A central proposition of SET is that '*when organisations invest in relational-specific assets, engage in knowledge exchange, and combine resources through governance mechanisms, a supernormal profit can be derived on the part of both parties*' (Cousins and Menguc 2006, 852). This supernormal profit is developed through socialisation of values both within the organisation and across the supply chain. The fundamental role played by senior supply chain professionals requires these individuals to take a leading role in permeating these values and expected behaviours within and throughout the supply chain (Chen and Paulraj 2004). Previous research has shown that social interactions between supply chain participants play a significant role in achieving high relationship performance outcomes (Cousins and Menguc 2006).

This new relationship form termed 'collaborative' has received growing attention from researchers (Sako 1992; Cousins et al. 2008). The characteristics of collaborative relationships include long-term orientation, total cost focus, information sharing, risk and reward sharing, and high levels of trust, communication and commitment (Tan et al. 2002; Sharma et al. 2008; Humphreys et al. 2011).

Underpinning SET is the role of mutual trust and respect. Researchers have reported that the social interactions of supply chain participants outside of the ‘normal’ working environment results in a network of trusted partners who can be mutually accessed at any time to support and enhance the relationships outcomes (Ahuja and Lampert 2001; Cousin et al. 2006). For example, in situations where there are unexpected changes in customer demand, the supplier will be flexible in responding to the needs of the buyer rather than referring to strict contractual terms such as lead times that could result in late or lost orders or, in the case of the retail industry, the application of costly penalties (Cadden et al. 2012). The terms used interchangeably to describe the results of these social interactions are ‘relational capital’ and ‘social capital’ (Dyer and Singh 1998). A stock of relational or social capital can be built through increased social interactions, for example, cross-functional teams or joint teambuilding days, resulting in a set of behaviours that support a culture of high performance and satisfaction for the supply chain members.

## ***2.2 Dependency and Organisational Culture***

The concept of organisational culture (OC) became popular towards the end of the 1980s and became widely referred to within organisations (Cadden et al. 2010). This was in part due the work conducted by organisational scientists (Hofstede et al. 1990; Schein 1985) and business experts (Deal and Kennedy 1982; Peters and Waterman 1982) who frequently used the term OC to provide a focus for enhancing performance in the workplace.

There have been many attempts to define and operationalise OC over the years. A study by Verbeke et al. 1998 (cited by Sirmon and Lane 2004) reported over 50 definitions in the mainstream literature at that time. However, while there is no single consensus about an exact definition of OC within the literature, most authors agree with a general definition that OC refers to “*the underlying values, beliefs and principles of the personnel as they are expressed in the management structure and practices*” (Fletcher and Jones 1992, 30). OC can manifest in the artefacts (practices, symbols or forms), structures, behaviours and attitudes throughout an organisation (Detert et al. 2000).

Organisational culture has received growing interest in the inter-organisational relationship literature, with the terms ‘cultural fit’ and ‘cultural compatibility’ used to explain relationship success or failure (Cadden et al. 2012; Cartwright and Cooper 1993; Naor et al. 2010; Shankarmahesh et al. 2003; Veiga et al. 2000; Weber and Camerer 2003). Cultural fit is typically referred to as the compatibility of two integrating firms’ cultures (Cartwright and Cooper 1993). While popular in the joint venture or merger and acquisition relationship literature, increasingly, supply chain researchers are reporting the benefits of cultural fit within supply chain relationships (Barringer and Harrison 2000; Cousins and Menguc 2006; Fawcett et al. 2008; Lamming et al. 2004 Lau and Goh 2005; McAfee et al. 2002; Mello and Stank 2005). For example, Fawcett et al. (2008), suggest that incompatibility of cultures between buyers and suppliers results in lower performance outcomes, while Cousins et al. (2008), Humphreys et al. (2011) and Phillips et al. (2006) make inferential comments about the influence of appropriate organisational cultures in determining supply chain success.

Dependence is important in building organisational culture and relational norms as it is the attraction of one party to another party in a social system, usually to gain resources it would be difficult or impossible for one party to gain on their own (Narashamin et al. 2009). These

social relationships are based on bonds of mutual dependence where one party has some control over the accomplishment of goals for itself and another party (Cook and Emerson 1978; Cook et al. 1983; Cook and Yamagishi 1992; Emerson 1962; Narashamin et al. 2009). One party is more powerful if it can fulfil another supply chain member's goals. In order to have positive relationship development, a party to the relationship would act in a relational manner rather than maximising their own position (Narashamin et al. 2009). An important characteristic of long-term relationships is the mutuality of power in the relationship (Cook and Yamagishi 1992; Rokkan and Haugland 2002). Mutually adapting behaviours, processes and norms to accommodate the other party builds trust in a relationship, while adaption by only one party (either buyer or supplier) signals a dependence imbalance (Narashamin et al. 2009; Rokkan and Haugland 2002). One way of showing commitment and mutual dependence in the relationship is by adapting to the relationship (Hallen et al. 1991). Adapting, even if the adapting party is in a dominant position, has positive spillover effects in terms of reputation, gaining knowledge and capabilities (Kang et al. 2009).

Exchanges in social relationships are part of the interaction process between the two parties, where observable actions are responded to by the other party (Hallen et al. 1991). These exchange relationships are dynamic processes that change and develop over time (Hallen et al. 1991; Dwyer et al. 1987). Buyer-supplier relationships are made up of interactions that signal commitment to the relationship and at the same time decrease opportunistic behaviour and threats to the stability of the relationship (Narasimhan et al. 2009). If one party is in a dominant position it can weaken its position by taking on further obligations to signal a commitment to the relationship by imposing costs on itself and behaving and acting in a relational manner (Fein and Anderson 1997; Heide and John 1998; Narasimhan et al. 2009).

Dependence and organisational culture concepts are frequently referred to together, as SET proposes that attitudes, norms and behaviours arise from the use of rewards and punishments in interdependent exchange relationships (Ketkar et al. 2012; Morgan and Hunt 1994). For example, to gain rewards, suppliers may be willing to customise components or services for a customer if this increases the customer's trust of the supplier (Cannon et al. 2010; Doney and Cannon 1997). When parties to an exchange are interdependent, this enhances performance as the parties reduce their opportunistic behaviour, increase relational norms (changing to more collaborative behaviours) and avoid actions that might undermine the relationship (Palmatier et al. 2007). Conversely, if there is imbalanced dependence this will negatively affect the relationship as collaborative norms are not embedded and there are more chances to use opportunistic actions.

At the beginning of relationships, shared understanding and expectations are created by establishing a formal agreement, making successful performance more likely. Relationships with high comparability are more likely to reach relationship objectives as this reduces conflict in the relationship by parties finding ways to resolve issues (Palakshappa and Gordon 2006). This enables collaboration by reducing complexity in the relationship (Adamides et al. 2008; Paul and McDaniel 2004). If one party uses coercive exchange behaviours over a period of time, the other party will reciprocate (Frazier and Rody 1991) with similar behaviours. So mutual dependency and power use over an extended period of time will shape the culture and behaviours within the relationship. When exchange partners share values, they will be more committed to their relationships (Morgan and Hunt 1994). Normative commitment is basing a relationship on mutual commitment and sharing over an extended period of time (Zhao et al. 2008). Through processes of commitment and information

sharing, companies in a relationship build a collaborative long-term oriented culture (Zhao et al. 2008).

As SET assumes that parties to a relationship will seek rewards and avoid punishments (Bandura 1986; Emerson 1976; Griffith, Harvey and Lusch 2006; Zhang et al. 2009), the response to a decision is determined by the rewards minus the punishments. Parties are much harsher towards a partner seen as using unfair behaviour and will even bear the brunt of costs to punish a partner that has used unfair behaviour (Griffith et al. 2006). Managers have to be careful to show justice and fairness in managing the relationship in order to create a positive, long-term relationship. They have to suppress and demotivate the use of opportunistic and power tactics (Cook et al. 1983; Narasimhan et al. 2009) and use and incentivise relational behavioural norms (Griffith et al. 2006; Masterson et al. 2000). If this continues into the long-term we conjecture that the repeated behaviours and actions will lead to a collaborative culture within the relationship. Therefore, our first proposition is:

**Proposition 1:** *Over time (over 5 years), interdependence in supply chain relationships leads to collaborative cultural behaviours between supply chain members.*

### ***2.3 Organisational Culture and Supply Chain Performance***

Supply chain performance has gained interest over the last decade (Chen and Paulraj 2004) due to an increase in long-term relationships and the co-operative nature of many supply chain relationships (Paulraj et al. 2007). Supply chain performance measures have traditionally included a range of financial measures such as return on investment, market share and net profit but these tend to reflect factors inside a firm's boundaries (Chen and Paulraj 2004; Gunasekaran et al. 2001; Wisner 2003). More recently, researchers have used the concept of operational performance to assess supply chain performance as operational performance '*reflects a direct indication of the effects of the relationship between the supply chain partners*' (Chen and Paulraj 2004, 127). Operational performance measures typically used in supply chain research include operating costs inventory costs flexibility and delivery performance (Ahmad and Schroeder 2003; Beamon 1999; Gunasekaran et al. 2001, 2004). However, while the current literature suggests benefits of cultural fit within supply chain relationships in terms of operational performance and relationship satisfaction (Barringer and Harrison 2000; Cousins and Menguc 2006; Fawcett et al. 2008), there are few empirical research articles on this topic.

The norm of reciprocity within the supply chain relationship is important in social exchange theory. If one party makes a contribution to the relationship it expects the other party to also make a contribution at a later time, creating a sense of obligation and resulting in changes of attitude and behaviour (Griffith et al. 2006). How each party acts and responds to these actions are important in determining the outcomes of these relationships (Zhang et al. 2009). Formal contracts do not underpin success in these relationships and relational mechanisms are necessary (Anderson and Weitz 1992).

A range of studies has demonstrated the importance of integration in relation to maximising supply chain performance for each partner (Gunasekaran et al. 2004; Lambert and Pohlen 2001). The inability to integrate has resulted in lower satisfaction and performance outcomes

for each supply chain member. We propose that integration is due to the convergence of cultural norms (Cousins and Menguc 2006; Fawcett et al. 2008). Furthermore, several studies have shown the positive effect of relational norms on the performance of exchange relationships (Griffith et al. 2006; Palmatier et al. 2007; Siguaw and Simpson 2004). For example buyer cooperation, communication and assistance increase a supplier's willingness to make relationship-specific investments, with buyer investment and assessment only indirectly influencing supplier's behaviour (Zhang et al. 2009). The buyer, in the relationship, is more likely to make relationship-specific investments when they communicate with and involve their suppliers more (Zhang et al. 2009). This is similar to the findings of power use (Benton and Maloni 2005) where expert and referent power have a direct positive effect on relationship outcomes, reward power having a mixed effect and legitimate and coercive power having a negative effect. We conjecture a similar dynamic for relational norms: collaborative cultural norms in interdependent relationships will lead to positive relationship outcomes while adversarial cultural norms will lead to negative relationship outcomes.

Research suggests that although relational norms have direct effects on all exchange outcomes they do not play a direct role in performance outcomes (Palmatier et al. 2007). However, other studies disagree (Liu et al. 2009). Reasons for this include the restricted nature of the norms studied and also the time period for assessing norm changes (usually one year). Indeed, studies have shown that relationship norms directly improve performance (Liu et al. 2009) with partner similarity bringing the buyer and the supplier in the relationship closer together, and partner differences creating less successful relationships (Beugelsdijk et al. 2009).

It appears that relationship norms directly improve performance (Liu et al. 2009) and a formal governance system of contracts and relationship-specific investments are complementary to the informal governance system of relationship norms in improving performance (Liu et al. 2009). Furthermore, if both the buyer and the supplier have a similar culture of market orientation (Hofstede et al. 1990; Verbeke 2000) this leads to better learning in the relationship and ultimately better relationship performance (Lai, Pai, Yang, and Lin, 2009).

SET operates within a cultural context, with norms and behaviours defined by the context. In a relationship, parties prefer to increase their social credit (by behaving in a positive way towards the other party) rather than have social indebtedness (where they are expected to contribute in the future) (Narasimhan et al. 2009). Partner similarity brings the buyer and supplier in the relationship closer together creating better operational and relationship performance (Beugelsdijk et al. 2009). Both TCT and SET state that if mechanisms are in place to reduce opportunism, social bonds develop between the parties to an exchange, which leads to positive relationship performance (Kaufmann and Carter 2006).

Therefore we propose:

**Proposition 2:** *Over time (over 5 years), collaborative cultural behaviours between supply chain members increases supply chain performance.*

## ***2.4 Organisational Culture and Supply Chain Satisfaction***

Many authors have written about the importance of managing satisfaction in supply chain relationships (Cambra-Fierro et al. 2008; Kannan and Tan 2007; Parsons 2002; and Sila et al. 2006). Satisfaction is an *'emotional response to the difference between what customers expect and what they ultimately receive'* (Jonsson and Zineldin 2003, 225).

At the beginning of supply chain relationships interdependence and integrative bargaining creates a situation of positive affective commitment (attachment to the relationship), increasing business transactions and satisfaction (Lawler and Yoon 1993). As the relationship progresses communication leads to both cooperation and trust, which is pivotal in relationship satisfaction (Anderson and Narus 1990). Buyers are less interested in overt relational mechanisms at the beginning of a relationship but once positive experience is gained, relational mechanisms strengthen the relationship (Autry and Golobic 2009).

Furthermore, the level of relationship satisfaction is directly correlated to the level of business success (Morrissey and Pittaway 2006). Ultimately, it is the customer who determines the level of success (Cambra-Fierro et al. 2008). In a supply chain relationship, the level of buyer satisfaction is the responsibility of the supplier. Increasingly, authors have recognised the role of soft factors such as communication (Jäckel et al. 2006) and trust in achieving high levels of relationship satisfaction (Handfield and Betchel 2002; Jonsson and Zineldin 2003; Kwon and Suh 2004; Morrissey and Pittaway 2006; and Rao et al. 2006).

In a supply chain setting, if a supplier has a high level of satisfaction with its buyer, this satisfaction will manifest itself in behavioural changes (Jonsson and Zineldin 2003). The supplier will react in a reciprocal manner showing high levels of trust and commitment to the relationship (Handfield and Betchel 2002; Kwon and Suh 2004). This high quality relationship will increase the buyer's and supplier's satisfaction (Benton and Maloni 2005).

Trust and commitment is evidenced in supplier actions such as responding positively and timely to unexpected changes in customer demand or proactively engaging in cost-reduction initiatives. Similarly, if the buyer has a high level of satisfaction with the supplier, this could result in increased business and investment for the supplier. Therefore, in an environment of high supply chain relationship satisfaction less opportunistic behaviour prevails and a culture of cooperation and openness is the norm. Therefore we propose:

**Proposition 3:** *Over time (over 5 years), collaborative cultural behaviours between supply chain members increase supply chain satisfaction.*

SET encompasses the relational view of management and posits that firms gain and sustain competitive advantage by combining and accessing resources from beyond the boundaries of the firm (Casson 1998; Dyer and Singh 1998). Careful nurturing and management of these social interactions throughout the supply chain results in high performance and satisfaction.

Figure 2 displays the proposed research framework based on the detailed literature review and critique above. We suggest that high levels of interdependence between buyer and supplier will positively influence the cultural behaviour of the supply chain members and will result in a culture of high performance and high relationship satisfaction for all members.

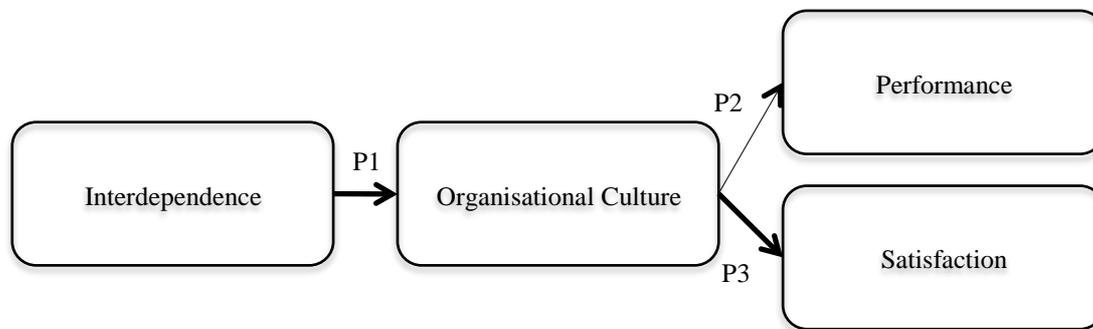


Figure 2. Research framework.

### 3. Methodology

The method adopted for this study is an exploratory longitudinal case study method to enable theory building. Due to the complexity of organisational culture and its complicated linkage to dependence and outcomes an exploratory multiple source method was deemed to be appropriate. According to Yin (1994) a case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident. The method also allows researchers to cope with multiple variables of interest and relies on multiple sources of evidence that converge and triangulate and benefit from theoretical proposition development to guide the data collection and analysis.

It is clear from the propositions that the study explores a complex process. It involves insights from informants, which may be personal or sensitive and informants may be apprehensive about revealing. This method allows for flexibility and the ability to incorporate an emerging design and the use of both quantitative and qualitative methods.

Furthermore, longitudinal research within buyer-supplier cultural studies is frequently called for (Cadden et al. 2012; Cousins and Menguc 2006; 2008). However, most studies avoid longitudinal research largely due to the complexity, time lag in accruing the data and gaining access to data over a sustained period (Yin 1994).

This study uses longitudinal data over a five-year period from 2006 to 2011 (known as time 1:T1 (2006), time 2:T2 (2009); and time 3:T3 (2011). T1 includes collection of data (both qualitative and quantitative) from the focal company (the buyer: TeleCo) in 2006; with similar follow up data collection in 2009 (T2) and 2011(T3).

Criticism of current supply chain management research is that much research focuses on one side of the relationship, i.e. the buyer's or the supplier's perception of the relationship (Cousins et al. 2008); tends to use a positivist (survey) approach alone; uses only one respondent, usually the buyer firm's purchasing manager; and takes a cross-sectional approach (Cadden et al. 2012; Cousins and Menguc 2006). Many authors agree there is a dearth of studies that include qualitative methodologies in the supply chain literature (Ambrose et al. 2010; O'Toole and Donaldson 2002).

Cultural fit within supply chain relationships is widely recognised as a construct that changes over time and is multifaceted (McHugh et al. 2003; Phillips et al. 2006). As such, the

approach of this study captures the temporal changes of cultural fit and the complexity of the cultural construct.

### *3.1 Case Selection*

The telecommunications industry has been of the most dynamic industries in the world over the past 10 years. In 2005, the International Telecommunication Union (ITU) published an overall growth rate of 31.7% for the global telecommunications market between 2001 and 2004. With merger and acquisition activity during this same period increasing by 40% over the previous five-year period (ITU 2005).

In general, the telecommunications market consists of three distinctive segments: Telecommunication service and network providers, equipment manufacturers and distributors. Each segment comprises almost a third of the market (Keynotes 2012). This study focuses on telecommunication equipment manufacturers (32% of market) as this sector is most likely to exhibit the phenomenon of interest, due to the nature of the exchange in the sector, the interdependence among supply chain members and the need for collaborative relationships.

In the year ending March 2005, the UK telecommunications market was worth almost £30 billion with the telecommunication equipment manufacturers representing almost £10 billion of this (Keynotes 2008).

Although the telecommunications industry is based on highly sophisticated technologies (a fibre optic cable the thickness of a hair on one's head carries capacity for over 30,000 telephone calls), traditional methods of supply and distribution are necessary in order to obtain and provide specific materials or services. Typical products, such as telephone exchanges have hundreds of printed circuit boards (PCBs), with each PCB housing over 200 different components and containing up to six different layers of material.

Accordingly, the pressures on companies to innovate, redesign and reduce costs, in an environment where life cycles are decreasing, are increasing (McIvor et al. 2006). The telecommunications market, in the research time period, was extremely dynamic and volatile. The industry was known for being "cut-throat". Profit margins within the industry were eroding: What management saw as "the good old days," where order books were full and bonuses were guaranteed, had disappeared.

Additionally, previous studies of the telecommunications sector gave interesting supply chain relationship insights (Humphreys et al. 2007; McIvor et al. 2006). For example, McIvor et al. (2006) highlighted how this sector of the telecommunications industry had issues with buyersupplier relationships and suggested that culture played an integral role in finding a solution.

#### *3.1.1 The Buyer Organisation*

The focal company in this study (known as TeleCo for anonymity purposes) operated in the telecommunications equipment sector and mainly provided network solutions. The company had four core business areas: Wireless networks, wireline networks, enterprise networks and optical networks. TeleCo had a strategy of make-to-order and operated an assembly and test facility for EMEA (Europe Middle East and Africa) from its UK base.

Even though TeleCo did not directly compete in the telecommunications services market, TeleCo heavily depended on the performance and growth of the sector, as the company provided its products to firms operating in this sector.

When the study commenced (2006), the organisation had almost 1,000 staff in its UK assembly and test facility. In 2011, the organisation still had approximately 1,000 staff. Key customers for the organisation included a range of telecommunications network and service providers, such as BT, Vodafone, Virgin and Orange. TeleCo had been operating within the UK for about 40 years. Senior staff represented about 35% of the workforce, with average years' service for senior staff around 10 years and over 20 years for junior staff. Labour turnover was low (<3%) and absenteeism was around 5% per annum.

Departments within TeleCo were broken down into order management, order fulfilment and order delivery with associated support services such as HR and IT. The company operated 24 hours a day, seven days a week with three shifts daily.

As most staff had been with the organisation for a significant period, there was a feeling amongst senior management that the organisation required transformational change. Therefore, senior management of the organisation initiated a transformational project whereby they wanted to 'change hearts and minds' in order to remain competitive. Tools such as lean were assessed for their viability to help with the change in culture within the organisation and the wider supply chain.

### *3.1.1 Supplier Selection*

The buyer organisation provided details of a supply chain it regarded as collaborative in nature and that involved high levels of interdependence. It also provided the researchers with access to the relevant supply chain members: tier 1 and tier 2 suppliers. Both of the suppliers were UKbased.

Supplier 1 (known as BoardCo) manufactured PCBs for TeleCo. TeleCo represented 35% of their business, and was therefore extremely significant. In turn, BoardCo were focused mainly on research and development. Their specialist knowledge coupled with a monopoly on specific high-tech components (resistors and asics) resulted in TeleCo's dependence on BoardCo.

Supplier 2 (known as PlasticCo) provided PCBs for BoardCo. BoardCo represented 45% of PlasticCo's business. In turn, PlasticCo was the only company who could provide the volume of PCBs required by BoardCo and therefore mutual dependence existed.

Throughout the supply chain there were joint investments in high technology products and devices by the three organisations underpinning the interdependence in the supply chain.

### 3.2 Data Collection Measures: Organisational Culture

As culture is a complex and multifaceted construct, a longitudinal case study with mixed methods was deemed to be most appropriate research strategy for this study (Eisenhardt 1989). At each stage of the study (T1: 2006; T2: 2009; and T3: 2011) a cultural questionnaire instrument was issued to all staff in the participating companies.

Semi-structured interviews, coupled with other qualitative techniques, such as company tours, attending buyer-supplier meetings and reviewing company documentation were used at each time point throughout the study. Triangulation methods, including direct observations and informal interviews with staff provided additional construct validity (Eisenhardt 1989; Platts and Song 2010; Yin 1994).

### 3.3 Survey

A pre-validated questionnaire devised by Verbeke (2000), which is an updated version of Hofstede et al.'s (1990) organisational practices tool, was issued to all staff in the participating organisations. This cultural instrument is widely used in inter-organisational research (Cadden et al. 2012; Pothukuchi et al. 2002) (see Appendix 1 and Table 1).

Table 1. Organisational culture definitions (Cadden et al., 2012).

Process score (/25)	A high process score indicates an organisation that is highly rule-driven, very procedural where staff will not alter from their defined roles. A low process score indicates an organisation that is focused on results and will deviate from set roles and responsibilities to ensure the job gets done.
Employee score (/40)	A high employee score indicates the organisation cares about the individual and their personal development and growth. A high level of absorptive capacity is evident. A low employee score reflects an organisation that does not care about employee development.
Open score (/20)	A high open core indicates an organisation that openly espouses constructive criticism. A low open score would suggest the organisation has a very defensive culture and a blame culture exists.
Tight score (/35)	A high tight score indicates an organisation that thrives on controlling its employees and how they behave. A low tight score reflects a loosely controlled organisation where flexibility and autonomy are more prevalent in achieving objectives.
Norm score (/25)	A high norm score indicates a pragmatic organisation that focuses on achievement. A low score on the norm scale indicates an organisation more focused on following standards.
Market score (/30)	A high market score is reflective of an organisation that is supply chain oriented and concerned externally about its operation environmental. A low market score indicates an organisation that is internally focused with little or no concern for its supply chain or operating environment.

The cultural instrument used is a 35-item, five-point Likert scale. The 35 items are broken down into six independent dimensions to assess organisational culture at a manifested practices level, these are: results versus process; employee versus job; open versus closed; loose versus tight; normative versus pragmatic; and market versus internal.

While it is accepted that the values level of culture is the richest source of information (Hofstede et al. 1990; Schein 1996), it is also recognised that this level is invisible. It is recognised that the practices level is where manifestations of these values are exposed (Trice and Beyer 1993)

For example, in the results versus process dimension, an organisation that scores highly on the results end of the scale represents an organisation that is flexible and focused on getting the job done, whereas a process-oriented organisation is one which is heavily rule driven and is more bureaucratic in nature. While previous studies have shown that opposites can attract (Cadden et al. 2012; Meirovich 2010) this does not apply in all scenarios (Cadden et al. 2012) as it can lead to cultural incompatibility and lower relationship satisfaction and performance (Pothukuchi et al. 2002; Jonsson and Zineldin 2003)

Pilot testing of the cultural questionnaire was performed prior to issuing to the study participants. Both academics (five) and industry experts (five) evaluated the questionnaire. Some minor adjustments to wording and scaling were made. Therefore, content validity was supported.

### ***3.4 Supply Chain Performance and Satisfaction***

Supply chain performance was measured by gaining access to the buyer's list of supply chain performance metrics. These metrics included a combination of operational (lead times; delivery performance; conformance to specifications) and business performance measures (net profit; earnings before interest and tax; and market share) in line with measures used in previous studies (Cadden et al. 2012; Chen and Paulraj 2004; Tan et al. 2002). In depth interviews at each time point, helped to triangulate the findings.

Supply chain satisfaction was measured by qualitative methods. Questions posed followed the structure used by Jonsson and Zineldin (2003) in assessing high satisfaction and included questions concerning communication, reputation, relationship benefit, cooperation, relationship bonds, and promise fulfilment.

Two supply chain personnel at both strategic and operational level from the participating companies (12 in total at each time point) were asked to comment on supply chain satisfaction (both upstream towards the suppliers and downstream towards the customers).

### ***3.5 Data Collection Process***

Each organisation's management team allowed the research team full access to distribute hardcopy questionnaires following an announcement through their company's e-zine and

functional team briefings. All responses were treated anonymously. Interviewees were selected at random at each time point from the HR database of staff with supply chain responsibilities.

The results were analysed using a series of analysis of variance (ANOVA) between the respective supply chain members at each time point. And a series of ANOVA's within each company over the three time points. Previous supply chain and culture studies have utilised this technique when assessing supply chain integration (Cadden et al. 2012; Quesada et al. 2008).

## 4. Findings

This section outlines the results from the quantitative (survey questionnaire) and qualitative findings from T1 (2006); T2 (2009) and T3 (2011).

### 4.1 Survey results

In T1 and 2, 1120 questionnaires were issued respectively, with 1260 issued in T3 (increase due to increase in tier 1 supplier personnel). 404, 336 and 450 participated in the research respectively. Table 2 provides the detailed breakdown by participant and time period. Average response rates were 40% (T1), 35% (T2) and 41% (T3) respectively, which is comparative to other survey research (Malhotra and Grover 1998).

Table 2. Collaborative supply chain data collection statistics.

Company	Questionnaires issued (T1)	Questionnaires returned (T1)	Percentage of returned usable questionnaires (T1)	Interviews (T1)
TeleCo	800	267	33.3%	4
BoardCo	200	79	39.5%	4
PlastiCo	120	58	48.3%	4
Totals	1120	404	40%	12
	T2	T2	T2	T2
TeleCo	800	214	26.7%	4
BoardCo	200	68	34%	4
Plastico	120	54	45%	4
Totals	1120	336	35%	12
	T3	T3	T3	T3
TeleCo	800	238	29.7%	4
BoardCo	400	184	46%	4
Plastico	60	28	46.6%	4
Totals	1260	450	41%	12

The mean total scores for each of the six organisational culture dimensions (between and within respectively) are reported in Table 3 and Table 4; and further illustrated in Figures 3-8.

Table 3. Cultural dimension score means; standard deviations and % (significances in bold).

Organisational Culture Dimension (score)	T1 (2006)			T2 (2009)			T3 (2011)		
	TeleCo	BoardCo	PlasticCo	TeleCo	BoardCo	PlasticCo	TeleCo	BoardCo	PlasticCo
Results score (/25)	15.37(M) 2.68(SD)	<b>11.24(M)</b> 1.69(SD)	16.25 (M) 1.98(SD)	14.23(M) 1.65(SD)	<b>12.13(M)</b> 1.34(SD)	15.34 (M) 1.56(SD)	17.34(M) 2.12(SD)	<b>14.23(M)</b> 0.92 (SD)	15.57 (M) 1.98(SD)
Employee score (/40)	21.11(M) 2.12(SD)	19.13(M) 1.57 (SD)	<b>27.54(M)</b> 1.54 (SD)	22.89(M) 2.67(SD)	18.65(M) 0.90 (SD)	<b>26.10(M)</b> 1.39(SD)	20.22(M) 2.10(SD)	19.65(M) 2.14 (SD)	<b>25.78(M)</b> 1.43(SD)
Open score (/20)	11.98(M) 2.29(SD)	13.32(M) 1.51(SD)	<b>15.67(M)</b> 1.36(SD)	9.98(M) 1.13(SD)	<b>14.34(M)</b> <b>1.24(SD)</b>	<b>14.37(M)</b> <b>1.80(SD)</b>	13.45(M) 2.11(SD)	<b>10.21(M)</b> <b>1.80(SD)</b>	15.42(M) 1.86(SD)
Loose score (/35)	14.43(M) 1.58(SD)	13.23(M) 2.75(SD)	<b>25.86 (M)</b> 0.98 (SD)	12.23(M) 1.21(SD)	16.22(M) 1.79(SD)	<b>23.86 (M)</b> <b>1.34 (SD)</b>	<b>18.43(M)</b> <b>1.34(SD)</b>	12.14(M) 2.60(SD)	<b>24.32 (M)</b> 1.32 (SD)
Norm score (/25)	14.65(M) 1.67(SD)	12.98(M) 2.17(SD)	<b>18.66(M)</b> 1.55(SD)	13.89(M) 1.34(SD)	13.12(M) 1.45(SD)	<b>17.56(M)</b> 1.81(SD)	15.12 (M) 1.50(SD)	13.13(M) 1.21(SD)	<b>19.54(M)</b> 2.56 (SD)
Market score (/30)	25.12(M) 2.90(SD)	25.55(M) 2.34(SD)	26.23(M) 1.80( SD)	26.02(M) 2.21(SD)	24.90(M) 1.87(SD)	25.78(M) 1.71( SD)	26.32(M) 2.28(SD)	25.21(M) 1.92 (SD)	24.21(M) 1.72( SD)
Results score (%)	61.48	<b>44.96</b>	65.00	56.92	<b>48.52</b>	61.36	69.36	<b>56.92</b>	62.28
Employee score (%)	52.78	47.83	<b>68.85</b>	57.23	46.63	<b>65.25</b>	50.55	49.13	<b>64.45</b>
Open score (%)	59.90	66.60	<b>78.35</b>	49.90	<b>71.70</b>	<b>71.85</b>	67.25	<b>51.05</b>	77.10
Loose score (%)	36.08	33.08	<b>64.65</b>	30.58	40.55	<b>59.65</b>	<b>46.08</b>	30.35	<b>60.80</b>
Norm score (%)	41.86	37.08	<b>53.31</b>	39.68	37.48	<b>50.17</b>	43.20	37.51	<b>55.83</b>
Market score (%)	83.72	85.16	87.42	86.72	82.99	85.92	87.72	84.02	80.69
Operational performance (/20)	<b>Good</b>	<b>Good</b>	Good	Good	Good	Good	Good	Good	Good
Customer relationship satisfaction (/25)	<b>Good</b>	<b>Good</b>	<b>Good</b>	Good	Good	Good	Average	Good	Good
Supplier relationship satisfaction (/25)	<b>Average</b>	<b>Average</b>	<b>Average</b>	Average	Poor	Poor	Average	Average	Poor

Table 4. Cultural dimension score means; standard deviations and % (within company time period significances in bold).

Organisational Culture Dimension (score)	TeleCo	TeleCo	TeleCo	BoardCo	BoardCo	BoardCo	PlasticCo	PlasticCo	PlasticCo
	(T1)	(T2)	(T3)	(T1)	(T2)	(T3)	(T1)	(T2)	(T3)
Results score (/25)	15.37(M) 2.68(SD)	14.23(M) 1.65(SD)	17.34(M) 2.12(SD)	11.24(M) 1.69(SD)	12.13(M) 1.34(SD)	14.23(M) 0.92 (SD)	16.25 (M) 1.98(SD)	15.34 (M) 1.56(SD)	15.57 (M) 1.98(SD)
Employee score (/40)	21.11(M) 2.12(SD)	22.89(M) 2.67(SD)	20.22(M) 2.10(SD)	19.13(M) 1.57 (SD)	18.65(M) 0.90 (SD)	19.65(M) 2.14 (SD)	27.54(M) 1.54 (SD)	26.10(M) 1.39(SD)	25.78(M) 1.43(SD)
Open score (/20)	11.98(M) 2.29(SD)	<b>9.98(M)</b> <b>1.13(SD)</b>	<b>13.45(M)</b> <b>2.11(SD)</b>	13.32(M) 1.51(SD)	14.34(M) 1.24(SD)	<b>10.21(M)</b> <b>1.80(SD)</b>	15.67(M) 1.36(SD)	14.37(M) 1.80(SD)	15.42(M) 1.86(SD)
Loose score (/35)	14.43(M) 1.58(SD)	<b>12.23(M)</b> <b>1.21(SD)</b>	<b>18.43(M)</b> <b>1.34(SD)</b>	13.23(M) 2.75(SD)	<b>16.22(M)</b> <b>1.79(SD)</b>	<b>12.14(M)</b> <b>2.60(SD)</b>	25.86 (M) 0.98 (SD)	23.86 (M) 1.34 (SD)	24.32 (M) 1.32 (SD)
Norm score (/25)	14.65(M) 1.67(SD)	13.89(M) 1.34(SD)	15.12 (M) 1.50(SD)	12.98(M) 2.17(SD)	13.12(M) 1.45(SD)	13.13(M) 1.21(SD)	18.66(M) 1.55(SD)	17.56(M) 1.81(SD)	19.54(M) 2.56 (SD)
Market score (/30)	25.12(M) 2.90(SD)	26.02(M) 2.21(SD)	26.32(M) 2.28(SD)	25.55(M) 2.34(SD)	24.90(M) 1.87(SD)	25.21(M) 1.92 (SD)	26.23(M) 1.80( SD)	25.78(M) 1.71( SD)	24.21(M) 1.72( SD)
Results score (%)	61.48	56.92	69.36		48.52	56.92	65.00	61.36	62.28
Employee score (%)	52.78	57.23	50.55		46.63	49.13	68.85	65.25	64.45
Open score (%)	59.90	<b>49.90</b>	<b>67.25</b>		71.70	<b>51.05</b>	78.35	71.85	77.10
Loose score (%)	36.08	<b>30.58</b>	<b>46.08</b>		<b>40.55</b>	<b>30.35</b>	64.65	59.65	60.80

Norm score (%)	41.86	39.68	43.20	37.48	37.51	53.31	50.17	55.83
Market score (%)	83.72	86.72	87.72	82.99	84.02	87.42	85.92	80.69

## 4.2 Within Case Supply Chain Results

A one-way ANOVA, using company grouping as the independent variable and total mean scores was analysed using each of the six cultural dimensions as the dependent variables to assess if significances were present between the companies. Post-hoc tests were then conducted to gain further insights, i.e., where the significance lay.

### 4.2.1 T1:2006

In T1, there were significant differences between the buyer, TeleCo and its suppliers on all dimensions, except the market score dimension. On the market score dimension each supply chain participant reported a similarly high score representing a supply chain that is interested and aware of its external customers.

Regarding the significant differences between the companies the results were:

- Results cultural sub-dimension produced a significant main effect,  $F(2, 402)=35.33$ ,  $p<.01$ . Post-hoc tests showed that the mean scores for the buyer, TeleCo, and tier one supplier, BoardCo, were significantly different ( $p<0.01$ ), with BoardCo significantly more process-driven.
- Employee cultural sub-dimension produced a significant main effect,  $F(2,402)=67.79$ ,  $p<.01$ . Post-hoc tests showed the employee scores for TeleCo were significantly different to those reported for tier two supplier PlasticCo ( $p<0.01$ ), with PlasticCo significantly more employee-oriented.
- Open cultural dimension produced a significant main effect,  $F(2,402)=37.323$ ,  $p<.01$ . Post-hoc tests showed that the mean open scores for TeleCo are significantly different to PlasticCo ( $p<0.01$ ), with PlasticCo significantly more open and constructive.
- Loose cultural sub-dimension produced a significant main effect,  $F(2,402)=11.84$ ,  $p<.01$ . Post-hoc tests showed that the mean loose scores for Teleco were significantly different to scores reported to PlasticCo ( $p<0.01$ ), with PlasticCo significantly more flexible and autonomous.
- Norm cultural sub-dimension produced a significant main effect,  $F(2,402)=33.19$ ,  $p<.01$ . Post-hoc tests showed that the mean norm scores for Teleco were significantly different to scores reported for PlasticCo ( $p<0.01$ ), with PlasticCo significantly more achievement-based than standards-oriented.

### 4.2.2 T2:2009

In T2, there were significant differences between buyer (Teleco) and its supply chain on all dimensions, except the market score dimension. On the market score dimension each supply chain participant again reported a similar high score.

Regarding the significant differences between the company grouping the below was found:

- Results cultural sub-dimension produced a significant main effect,  $F(2,334)=8.445$ ,  $p<.01$ . Post-hoc tests showed that the mean scores for the buyer, TeleCo, and tier one supplier, BoardCo, were significantly different ( $p<0.01$ ), with BoardCo significantly more process and procedure-oriented.
- Employee cultural sub-dimension produced a significant main effect,  $F(2,334)=31.34$ ,  $p<.01$ . Post-hoc tests showed the employee scores for TeleCo were significantly different to those reported for tier two supplier PlasticCo ( $p<0.01$ ), with PlasticCo significantly more employee-oriented.
- Open cultural dimension produced a significant main effect,  $F(2,334)=11.44$ ,  $p<.01$ . Post-hoc tests showed that the mean open scores for TeleCo were significantly different to BoardCo ( $p<0.01$ ) and PlasticCo ( $p<0.01$ ), with BoardCo and PlasticCo significantly more open with less of a blame culture present.
- Loose cultural sub-dimension produced a significant main effect,  $F(2,334)=70.69$ ,  $p<.01$ . Post-hoc tests showed that the mean loose scores for Teleco were significantly different to scores reported by PlasticCo ( $p<0.01$ ), with PlasticCo significantly more adaptable and flexible.
- Norm cultural sub-dimension produced a significant main effect,  $F(2,334)=67.55$ ,  $p<.01$ . Post-hoc tests showed that the mean norm scores for Teleco were significantly different to scores reported for PlasticCo ( $p<0.01$ ), with PlasticCo significantly more pragmatic.

#### *4.2.3 T3:2011*

In T3, there were significant differences between the buyer (Teleco) and its supply chain on all dimensions, except the market score dimension. The market score dimension for each supply chain participant remained consistently high.

Regarding the significant differences between the company grouping the below was found:

- Results cultural sub-dimension produced a significant main effect,  $F(2,448)=22.99$ ,  $p<.01$ . Post-hoc tests showed that the mean scores for the buyer, TeleCo, and tier one supplier, BoardCo, were significantly different ( $p<0.01$ ), with PlasticCo significantly more procedure-oriented.
- Employee cultural sub-dimension produced a significant main effect,  $F(2,448)=18.47$ ,  $p<.01$ . Post-hoc tests showed the employee scores for TeleCo were significantly different to

those reported for tier two supplier PlasticCo ( $p < 0.01$ ), with PlasticCo significantly more employee-oriented.

- Open cultural dimension produced a significant main effect,  $F(2,448)=77.39$ ,  $p < .01$ . Post-hoc tests showed that the mean open scores for TeleCo were significantly different to BoardCo ( $p < 0.01$ ), with BoardCo now significantly less open and constructive.
- Loose cultural sub-dimension produced a significant main effect,  $F(2,448)=44.93$ ,  $p < .01$ . Post-hoc tests showed that the mean loose scores for TeleCo were significantly different to scores reported for both BoardCo ( $p < 0.01$ ) and PlasticCo ( $p < 0.01$ ), with BoardCo now espousing a controlling culture and PlasticCo significantly more flexible in its culture.
- Norm cultural sub-dimension produced a significant main effect,  $F(2,448)=16.76$ ,  $p < .01$ . Post-hoc tests showed that the mean norm scores for TeleCo were significantly different to scores reported for PlasticCo ( $p < 0.01$ ), with PlasticCo significantly more focused on achievement than standards.

### ***4.3 Within Company Findings***

Interestingly, when analysing the survey results across time periods within each company, we found the only significant differences were within the open and loose cultural sub-dimensions of the buyer and the tier 1 supplier, as below:

#### *4.3.1 Teleco*

In TeleCo, the Open cultural dimension produced a significant main effect,  $F(2,717)=11.12$ ,  $p < .01$ . Post-hoc tests showed that the mean open scores for TeleCo were significantly different between T1 and T2, and T2 and T3 ( $p < 0.01$ ). Teleco became more defensive from T1 to T2, and then more open in T3.

Additionally, in Teleco the Loose cultural dimension produced a significant main effect,  $F(2,717)=16.30$ ,  $p < .01$ . Post-hoc tests showed that the mean open scores for TeleCo were significantly different between T1 and T2, and T2 and T3 ( $p < 0.01$ ). Teleco become more controlling from T1 to T2, and then more flexible in T3.

#### *4.3.2 Tier 1 Supplier (BoardCo)*

In BoardCo, the Open cultural dimension also produced a significant main effect,  $F(2,329)=19.78$ ,  $p < .01$ . Post-hoc tests showed that the mean open scores for BoardCo were significantly different between T2 and T3  $p < .01$ . With the results highlighting a culture that went from open to defensive and blame-oriented.

Furthermore, the Loose cultural dimension also produced a significant main effect,  $F(2,329)=11.15$ ,  $p < .01$ . Post-hoc tests showed that the mean loose scores for BoardCo were significantly different between T1 and T2, and T2 and T3 ( $p < .01$ ). With the results

highlighting a culture that went from quite controlling to more controlling and then to flexible.

#### 4.3.3 Tier 2 Supplier (PlasticCo)

PlasticCo had no significant differences across cultural dimensions over time.

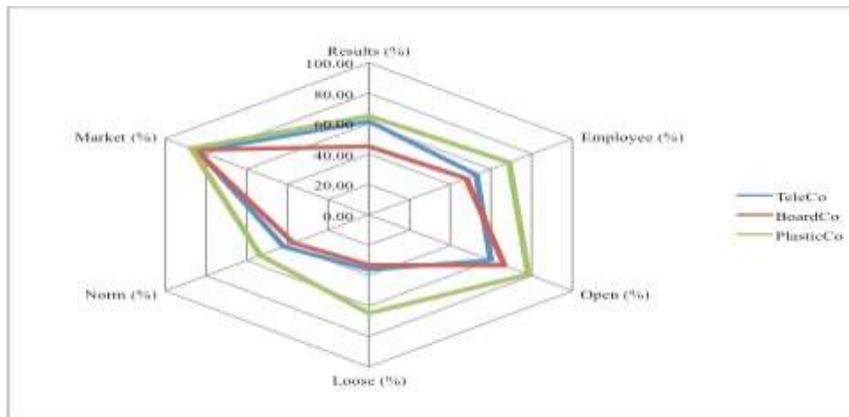


Figure 3. Cultural dimension scores 2006 (between supply chain partners).

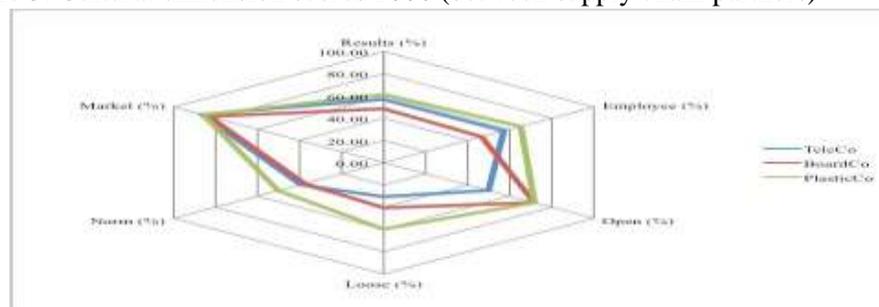


Figure 4. Cultural dimension scores 2009 (between supply chain partners).

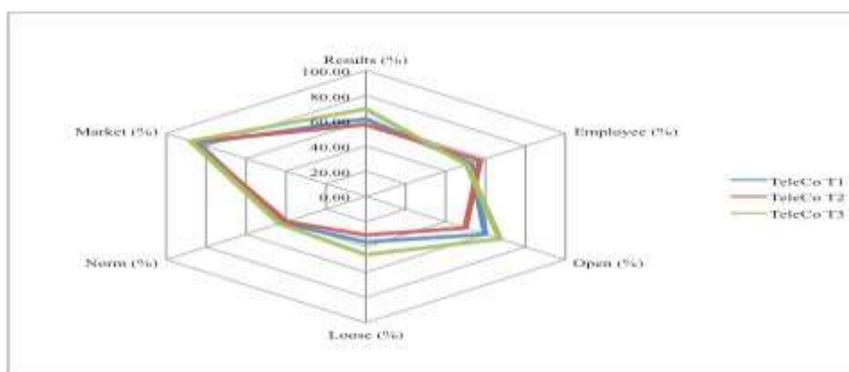


Figure 5: Cultural dimension scores 2011 (between supply chain partners).

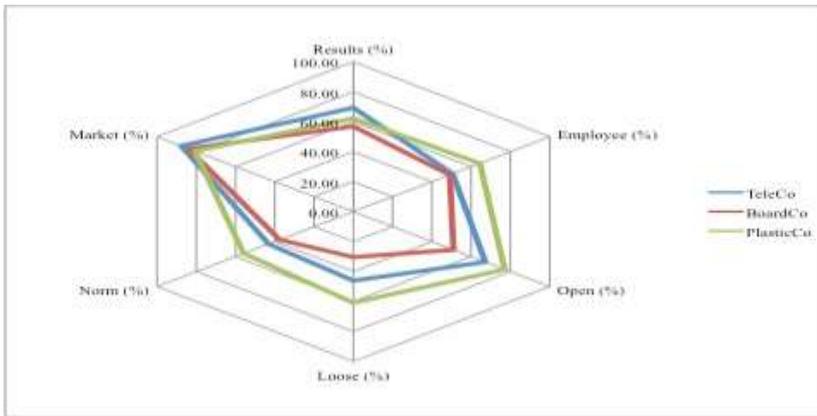


Figure 6: Buyer profile over time.

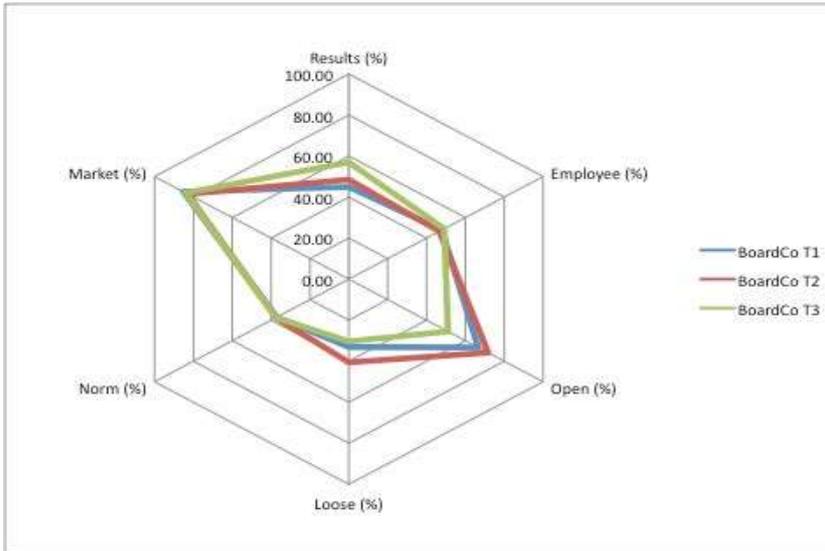


Figure 7: Tier 1 Supplier profile over time.

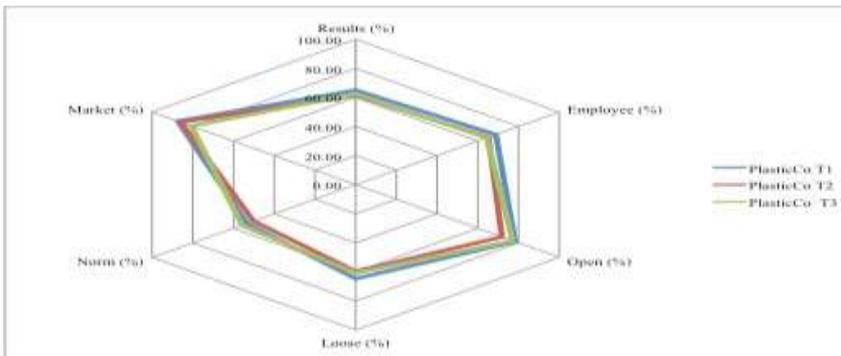


Figure 8: Tier 2 Supplier profile over time.

#### 4.4 Case Results

On completion of each stage of the survey, a systematic series of qualitative techniques were employed to verify and clarify findings. In-depth interviews supported by company tours and access to documentation were the main forms of qualitative analysis used to triangulate findings and ensure reliability and validity (Voss et al. 2000; Sousa and Voss 2001)

The qualitative data revealed that over time the cultures of both TeleCo and BoardCo began to shift. While it was expected that any shift would be towards a similar collaborative culture, the opposite was true. TeleCo began with a culture that was results-based with a balanced cultural approach between getting the job done and employee growth and development. However, over time the organisation shifted towards being more controlling and defensive (T2) and back to more flexible again (T3). BoardCo began with an open culture and flexibility towards changes in customer demand. BoardCo then became even more flexible and open in T2, which is expected in a collaborative relationship as it matures (Cannon et al. 2010). However, by T3 BoardCo became more controlling and less adaptable. Meanwhile, PlasticCo remained customer-focused and flexible throughout the research period and displayed traits of an organisation truly interested in long-term collaboration.

This cultural shift in TeleCo and BoardCo was highlighted by a TeleCo purchasing manager when discussing pricing strategy:

“My aim is to get as much profit as I can from the supplier. There was one time when we were negotiating, the supplier agreed really quickly. Afterwards, I felt gutted. If only I would have asked for a bit more. I know I would have got it! ... You see, I don't mind the supplier making a profit...it makes good business sense and mitigates the risk to make sure they stay in business, but if they are making 300% profit on our items, then I am disgruntled...”

This attitude was reinforced by a further comment by a TeleCo senior manager in relation to long-term relationships with suppliers:

“We have collaborative relations with our supply base. Well, what we term collaborative. It is more about risk management. We always bargain with our supplier and threaten that we have other suppliers biting at our hand, but this is a tactic we use to keep them on their toes...to be honest, the switching costs are too high. We would rather remould our suppliers rather than start looking for new ones...anyhow, we have made too much of an investment in terms of equipment and time to change...and they do perform well. “

However, the buyer had noticed a change in how BoardCo was behaving towards them by T3:

“Tier 1 supplier's behaviour has changed in recent times. There is increasing consolidation in the supply base. They are more vertically integrated than before. They feel they now have more influence because of this and because volumes in our business have gone down... I partly think they are getting their own back, as we as a company have tended to lead with an iron fist down the years...”

BoardCo, on the other hand, highlighted the behaviour of the buyer in relation to cost across all time periods:

“The buyer doesn’t understand total cost; they are obsessed with price. As an organisation they work in silos. They will only measure what makes them as individuals look good, rather than what is right for the overall business. We forever initiate cost reduction activities. They forever design gold-plated product where cheap plastic would do...but even when we educate them and help drive total cost down this way, they still come back the next year looking to lower the price again...comments like ‘I know you saved us money but the big bosses are pressuring me to reduce the price’...!”

On asking BoardCo their views on long-term collaborations (T2; then T3) one manager responded:

T2: “The buyer has become increasingly demanding and controlling. They are trying to get us to do the impossible sometimes...it is a result of order volumes going up...they think they have the liberty to dictate...we tend to try to be as flexible as we can; partly because that’s who we are, and partly because it’s a tough market and it is better the devil you know...”

T3: “We have worked with TeleCo for a long time. They need us as much as we need them. However, it still doesn’t prevent gamesmanship going on from both sides. We are in the business of making money and we know from experience that TeleCo will turn the screw (referring to squeezing on cost, in particular) when they can, so when we are in a position to do the same, why wouldn’t we...”

Interestingly, PlasticCo had a different attitude as one manager explained:

“We try to remain customer-focused. There is always a lot of churn from our customers. We expect this. Sometimes, it can be frustrating dealing with, at times, quite aggressive customers (sighs), but we are in it for the long haul, and I believe that as we work closer together we can educate them and start to get the benefits of openness and sharing...”

In summary, the quantitative and qualitative results have highlighted that organisational cultures are different within the supply chain at each time period, yet performance is still regarded as good. Cultures changed quite dramatically between time periods with a shift in cultural types. The buyer went from being quite controlling and defensive to one that became more open, flexible and constructive. Whereas, the tier 1 supplier’s cultural type did the opposite almost in tandem.

Throughout, satisfaction upstream (buyer to tier 1 supplier; and tier 1 supplier to tier 2 supplier) is regarded as positive, whereas downstream satisfaction was assessed as average or poor by the supply chain members.

## **5. Discussion**

The study has four key findings from the research data. First, even in supply chain relationships where interdependence existed, collaborative cultural behaviours were largely absent, especially at senior management level. Second, managers seemed to be using the term collaborative as a pseudonym for risk management. Third, transactional mechanisms at a strategic level led to opportunistic behaviour. Fourth, collaborative cultural behaviours in these cases appeared to have a greater influence on performance and satisfaction enhancement when used alongside transactional mechanisms rather than alone. These findings will now be discussed in context of the research propositions.

**Proposition 1:** *Over time (5 years), interdependence in supply chain relationships leads to collaborative cultural behaviours between supply chain members.*

While theory suggests that as relationships mature over time the high level of interdependence in the supply chain relationships would lead to collaborative cultural behaviours between supply chain partners (Cannon et al. 2010; Lonsdale 2001; Shankarmahesh et al. 2003; Wilson 1995), this did not hold in this research. In other words, the rhetoric did not match the reality.

The theory on power and dependence discusses the importance of maintaining an equilibrium in supply chain relationships (Dwyer et al. 1987; Liu et al. 2009; Payan and McFarland 2005;) and while we found that the interdependence was a key reason why the partners remained in the relationship (Cannon et al. 2010), when a supply chain member gained perceived advantage they attempted to use that power. So, even while interdependence existed, opportunistic behaviours were exposed. For example, in T2 the buyer's volumes increased. It would be expected in a collaborative relationship, underpinned by SET, that as volumes increased the buyer would not be opportunistic in their pricing strategy but instead agree an optimal pricing point (Narasimham et al. 2009), however, the buyer attempted to renegotiate price downwards at every opportunity, using threats (like substitute products from alternative suppliers) as a weapon. The tier 1 supplier resisted any change as they were aware of their own mutual power and the investment made by the buyer in high technology equipment.

In T3, when the buyer volumes decreased and the supply base consolidated through a period of vertical integration, the tier 1 supplier reciprocated the opportunistic behaviour displayed by the buyer in T2 and tried to alter the contract and relationship terms. This reciprocal behaviour where one participant mirrors the behaviour of their supply chain partner is positive for the relationship if the behaviour is collaborative, but in this study reciprocal behaviour only surfaced when behaviour was negative. This concurs with work by Balthazard et al., (2006) who found that defensive cultures resulted in lower relationship satisfaction. It appeared that this industry is 'wedded to its old ways' and behavioural change is required.

However, supply chains rarely think as supply chains and more often as individual entities. Best value supply chains form a compatible culture of high performance and satisfaction for all partners (Ketchen and Hult 2007), while socialisation mechanisms such as crossfunctional teams, joint team-building and matrix reporting structures across the supply chain have shown positive results in developing a culture of cooperation and trust (Cadden et al. 2012; Cousins et al. 2008). With mechanisms more effective at the relationship outset (Cadden et al. 2012).

Trust is recognised as a relational mechanism that develops over time (Kwon and Suh 2004; Levinthal and Fichman 1988; Liu et al. 2009) and where opportunism exists, trust and commitment are weakened (Joshi and Arnold 1997). In this supply chain there is a high level of trust between the companies in terms of competence trust: delivering a quality product (Cousins 2002) and contractual trust: delivering on time. However, the level of trust in relation to cost (openness and sharing of rewards) is low. The authors argue that this is largely due to the managers using transactional mechanisms, such as contracts, terms, and service level agreements at the outset of the relationship and ignoring relational governance mechanisms, such as joint team-building and cross-functional teams which lead to an environment of trust, openness and two-way communication (Cousins et al. 2008; Narashamin et al. 2009). We suggest that treating both transactional and relational mechanisms (such as collaborative culture) as equals will embed a mutual culture of collaboration.

This research therefore concurs with those authors who suggest that relational and formal governance are complementary (Liu et al. 2009) while we diverge with others who see relational and formal governance mechanisms as substitutes (Sengun and Wasti 2007; Dyer and Singh 1998; Larson 1992). Long-term commitment in buyer-supplier relationships is not perpetuated due to either economic or social mechanisms but as a result of both (Autry and Golicic 2009; Mintu-Wimsatt and Gassenheimer 1996).

**Proposition 2:** *Over time (5 years), collaborative cultural behaviours between supply chain members leads to enhanced supply chain performance.*

While over time, collaborative cultural behaviours between supply chain members have the ability to lead to enhanced supply chain performance (Cannon et al. 2010), it was found in this study that excellence in performance was not achieved. This was largely due to the behaviour of the senior management in the buyer and tier 1 supplier (Prajogo and McDermott 2011). Performance was deemed good rather than excellent. When this was explored, we found that performance was founded on two factors: The use of transactional mechanisms at a strategic level, whereby contracts were negotiated and service level agreements and pricing were discussed; and the presence of collaborative cultural behaviours at an operational level. It appears that while it is useful and indeed important to have a template for the ‘modus operandi’ of the relationship, day-to-day business needs cannot be documented to cover every eventuality. As the tier 1 supplier purchasing expeditor said:

‘To consistently refer to “the paperwork” every time we had an issue would result in relationship meltdown within hours.’

The fact that the buyer and the tier 1 and 2 operational staff worked together on a daily basis enabled a development of trust, cooperation and understanding, which was lacking at a strategic level. This concurs with other work (Cadden et al. 2012; and Cousins et al. 2008) that suggested that it is at the operational level where performance is achieved. Therefore, to translate performance from good to sustained excellence, senior management must embrace

the same collaborative behaviours found at the operational level. As values are embedded early in a relationship (Hofstede et al. 1990) we suggest that using soft cultural mechanisms at the outset of the relationship, such as team building activities and joint away-days would enhance collaborative behaviours. However, it takes time to change behaviours, as one buyer said:

‘I treat my suppliers like a football manager would treat his team...to be successful you don’t get too close!’

It is perhaps this distance that could cost the supply chain high performance outcomes over a sustained period.

Much of supply chain theory to date has focused on looking through the lens of one theory, namely TCT. Much less work has been done on SET, and less again on ‘complementary theory’. This study has shown that no one theory in isolation is the ‘magic pill’ for success. In fact, it is a complex interrelationship between many differing theories at differing points in a relationship (Liu et al. 2009). While TCT is more prevalent at the outset of most relationships, SET also needs to be embedded early and managed as the relationship progresses. However, in order for firms to truly maximise the benefits of collaborative relationships, senior management at a strategic level must embrace the real meaning of the term ‘collaborative’. At present, collaboration in this case is about risk management not longterm relationships, open-book costing, information transparency and two-way communication. Lip service is paid to the term collaboration, which is doing a disservice and real harm to supply chain performance.

Research has shown that better performance in the relationship can result from a number of different sources. The highest performance may be when there is a combination of both control mechanisms (TCT) and social bonds (SET) (Kaufmann and Carter 2006).

**Proposition 3:** *Over time (5 years), collaborative cultural behaviours between supply chain members lead to enhanced supply chain satisfaction.*

This statement was found to be true in our data. It was supported in this study through a low score in satisfaction resulting from adversarial cultural behaviours between supply chain members downstream. From our data, it appears that firms have different faces. The face they show to their customer is ‘putting their best foot forward’ (perhaps falsely positive), while quite often the face they show to their supplier is the opposite and is often a replication of how they are treated by their customer (truly negative). For example, BoardCo regarded their satisfaction of the relationship with TeleCo at T1 as average and T2 as poor. TeleCo’s culture changed from quite controlling and reasonably flexible to extremely controlling and inflexible during this period. TeleCo’s approach of managing by fear resulted in dysfunctional behaviour (Lindermann et al. 2003; Neely 2002) and negative relationship satisfaction.

In this study, it appears that upstream satisfaction is reasonably good whereas downstream satisfaction is average and poor over time. The reason behind this appears to be that BoardCo

and PlasticCo deliver on time, on cost and on quality, which results in the downstream partner's satisfaction with performance. However, the partner who is delivering on time, on service and on cost has issues with the culture and approach of their downstream partner, which is causing them a high level of dissatisfaction.

If the focal firm has a high level of satisfaction in a supply chain setting, a behavioural change may follow throughout the chain (Jonsson and Zineldin 2003; Saxton 1997). In other words, reciprocal behaviour will be the result. For example, if the buyer demonstrates a high level of trust in the supply chain, the supply chain will likely react by affording the buyer the same high level of trust and will result in high levels of satisfaction for all parties (Handfield and Betchel 2002; Kwon and Suh 2004). However, if the buyer exhibits low levels of trust, then it is likely the supply chain partners will also react by affording their respective partners low levels of trust in return. The outcome will result in a low level of relationship satisfaction.

## 6. Conclusion

In general terms, the rhetoric of interdependence and collaboration does not match the reality in this study. Interdependence over time should result in high levels of collaborative cultural behaviours, which in turn should result in higher levels of performance and satisfaction. However, in this study the buyer and tier 1 supplier are engrained in TCT and neither partner is willing to move towards a place of true collaboration.

It was found in this study that a hierarchy of relationship needs (see Figure 9) exists. Transactional mechanisms form the basis of the relationship and are the foundational principles on which to build. However, for the relationship to develop over time and be truly successful, collaborative and relational mechanisms must be over-laid. Such an approach will result in a fully integrated partnership espousing characteristics of trust, cooperation and information sharing.

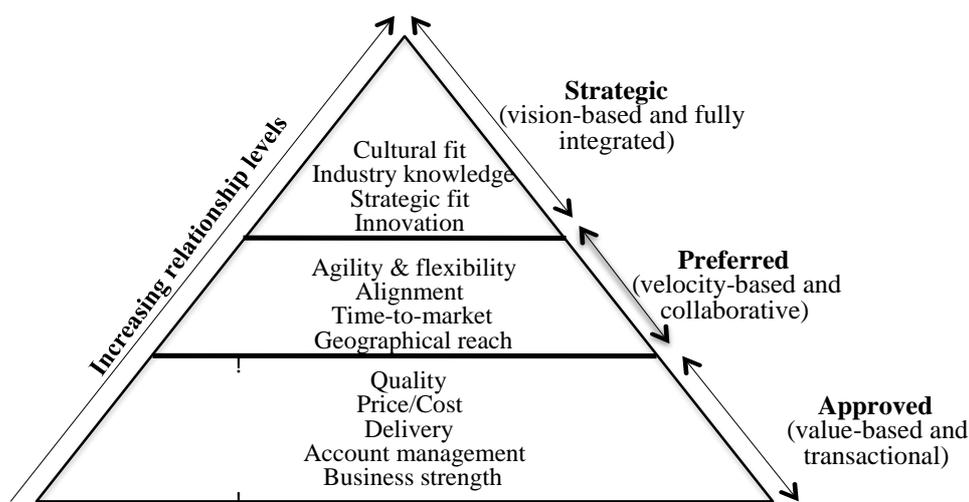


Figure 9. Hierarchy of relationship needs.

From a managerial perspective firms must realise the need to not only have transactional mechanisms in place, but also have collaborative cultural practices that work in tandem with transactional mechanisms in order to achieve higher and sustained levels of performance and satisfaction. This collaborative culture can be developed through working closely together through cross-functional teams and joint away-days, both at operational level and strategic management level from the relationship creation (Cousins and Menguc 2006).

Further, behavioural change in relation to how firms deal with each other in respect of pricing strategies and service level agreements are vital. Companies need to have consistent strategies and agreements to allow trust and openness to develop and to diminish opportunism. The development of mutual goals and shared objectives will aid a high performance culture. However, the buyer must be willing to make the first move towards true collaboration in order to develop and engender high levels of trust in their supply chain members. From a theory perspective, insights into how TCT and SET actually work in tandem have been developed and a useful hierarchy and platform for further development has been proposed.

### ***6.1 Future Research Directions and Limitations***

This study examined three supply chain companies in order to understand the impact of interdependence on supply chain culture, performance and satisfaction. It used a multimethod research strategy over a sustained time period of five years. As with any study there were limitations. Firstly, the number of organisations involved was limited to allow for depth, which makes it difficult to generalise outside the sample. Although this paper was more concerned with generalising to theory than to a wider population this limitation could be solved in future research. As this study was exploratory in nature, quantitative techniques to test the propositions of the research and explain the relationships between the proposed variables could be an important avenue for further research. Additionally, the research was conducted within one supply chain again restricting generalisability. Future research could replicate the study in multiple supply chains and in different industries. The research also focused on one type of dependency: interdependence. Future research agendas could take into consideration multiple types of dependency and their effect on culture, performance and satisfaction.

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## **Appendix 1: Verbeke's (2000) Practices Questionnaire**

Questions asked about the participant's workplace, how much do you agree or disagree with the following statements (1 strongly agree to 5 strongly disagree).

### **PROCESS**

1. When confronted with problems, the people of a department are rarely being helped by people of other departments
2. The tasks of employees that are absent are rarely taken over by colleagues
3. Requests from other departments are only carried out if the formal procedures have been followed
4. On special projects, there is a laborious cooperation between the various departments
5. The employees contribute their bit by directly following the prescribed methods of the managers

### **EMPLOYEE**

6. With respect to people who do not feel too happy about their job, but who still perform well, new possibilities are being searched for them
7. Whenever an employee is ill, or when something has happened in his personal life, managers ask after their problems with interest
8. Employees are encouraged to take courses and to go to seminars and conferences to help their self development
9. If there are personal conflicts between employees within a department, the managers will attempt to solve these problems
10. With respect to birthdays, marriages and births, my manager shows a personal interest
11. In matters that directly involve them, employees usually have a say
12. My manager compliments employees on work well done
13. Senior management ensure my job doesn't become too pressurised

### **OPEN**

14. If a manager has a criticism of an employee he/she discusses it openly with them
15. Employees express any criticisms of management directly to the management
16. At my work employees are asked for constructive criticism to help their managers performance
17. The mistakes of a colleague are personally discussed with him/her

### **TIGHT**

18. Managers always check if the employees are working
19. If one is a little late for an appointment with the manager, s/he will be rapped on his/ her knuckles
20. If an employee goes to the dentist during working hours, there is a check on how long s/he stays
21. Concerning the employees' expenses, the costs have to be specified in detail
22. If an employee is 15 minutes late for work, but goes on for an extra 15 minutes at the end of the day he/She is called to account
23. The number and duration of the breaks employees take are always checked by the managers 24. If an employee has to go to an important appointment he/she has to convince the manager of the importance of the appointment

### **NORM**

25. In my organisation major emphasis is on meeting customer needs
26. Results are more important than procedures
27. Employees never talk about the history of the organisation
28. I believe where I work contributes little to society
29. I believe where I work actively honours its ethical responsibilities

## **MARKET**

30. The satisfaction of the customers is measured regularly
31. Product promotions/ actions by the competition are reported in detail to everyone
32. The consumers preferences are investigated thoroughly
33. The company provides products/ services that meet the needs of the various target-groups
34. The future needs of the customers are discussed extensively with the various departments
35. In talks with customers, people try to find out about the future needs of the customers