FUNDAÇÃO GETÚLIO VARGAS
ESCOLA DE ADMINISTRAÇÃO DE EMPRESAS DE SÃO PAULO

CLAUDIO MINERBO

THE DIMENSIONS OF TRUST IN INTERORGANIZATIONAL RELATIONSHIPS: HOW BUYER AND SUPPLIER PERSPECTIVES DIFFER?

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Dissertação de mestrado apresentada à Escola de Administração de Empresas de São Paulo da Fundação Getulio Vargas como requisito para obtenção do título de Mestre em Administração de Empresas.

Campo de conhecimento:
Gestão de Operações e Competitividade

Orientadora: Prof. Dr. Susana Carla Farias Pereira

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Data da aprovação:

___/ ___/ _____

Banca examinadora:

_____
Prof. Dr. Susana Carla Farias Pereira (Orientadora)
FGV- EAESP

_____
Prof. Dr. Barbara Flynn
FGV- EAESP / Indiana University

_____
Prof. Dr. Marcos Andre Mendes Primo
FGV- EAESP

I dedicate this work to my family ...

... my dear wife Ana Paula, who was always very patient and supported me during these intense years, even when my mind was in other places,

... my loved sons Julien and Patrick, who at the age of 16 and 10 years old were subject to discuss trust and relationships during the most odd times of the week.

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ABSTRACT

Although research on interorganizational trust and its relationship with performance has been conducted for a long time and through Transaction Cost Economics, Social Exchange Theory and Marketing Channels, three gaps were found in the literature to be explored.

First, there is an ongoing debate around three conceptual streams on the multidimensionality of trust and how it should be operationalized and measured - as a multidimensional construct defined by non dominant dimensions, a construct based on two dominant dimensions (affective and calculative), or as a single dimensional construct. Second, there is still some ambiguity in how the dimensions of trust have been defined and operationalized, leading to artifacts of measurement equivalence and contradicting results. Third, the different perceptions that buyers and suppliers may have in each dimension of trust and its consequence to logistics performance is still unclear.

This research examines trust in buyer-supplier relationship in one empirical study with two independent samples in the logistics sector in Brazil: one examines buyers' perceptions and the second examines suppliers' perceptions. The two studies are then compared in order to determine the different perceptions of trust and implications to logistics performance.

Multivariate analysis show that trust seems to be present in interorganizational relationships, and is the buyer´s perception of trust on the supplier that has a stronger relationship with logistics performance. At the same time, buyers have a more negative perception of suppliers in measurable dimensions of trust (competence and performance), while no differences were found in social aspects of trust (honesty and benevolence), and this may be a result of environment and cultural characteristics. Data analysis showed that trust can be defined as a multi-dimensional construct but should be measured as a single-dimensional construct driven by competence and credibility.

This study contributes to practice by suggesting how managers could better leverage interorganizational trust to improve logistics performance.

Key words: interorganizational, trust, buyer-supplier

RESUMO

Apesar da pesquisa em confiança interorganizacional e sua relação com performance ter sido conduzida sob as perspectivas da Teoria de Custos de Transação, Teoria das Trocas Sociais e Canais de Marketing, três importantes lacunas na literatura requerem investigação.

Primeiro, está em andamento um debate conceitual sobre a multi-dimensionalidade da confiança, e como ela deve ser operacionalizada e medida, e que se divide em três correntes de pensamento - um construto multidimensional definido por dimensões não dominantes, um construto baseado em duas dimensões dominantes (afetiva e calculativa), ou um construto unidimensional. Segundo, existe ambiguidade em como as dimensões da confiança são definidas, levando a artefatos de equivalência nas escalas e resultados contraditórios. Terceiro, as diferentes percepções que compradores e fornecedores podem ter em cada dimensão da confiança e seu impacto na performance logística ainda não estão claros.

Esta pesquisa empírica examina a confiança nas relações entre compradores e fornecedores no setor de logística no Brasil, através de duas amostras e estudos independentes: um examina a percepção dos compradores e o outro examina a dos fornecedores. Em seguida, os dois estudos são comparados para determinar as diferentes perspectivas da confiança e as implicações na performance logística.

A análise multivariada mostrou que a confiança parece estar presente nas relações interorganizacionais, e é a percepção do comprador que possui maior relação com a performance logística. Ao mesmo tempo, compradores percebem fornecedores de forma mais negativa nas dimensões mensuráveis (competência e performance), enquanto não foram encontradas diferenças nos aspectos sociais (honestidade e benevolência), o que pode ser resultado do ambiente e cultura pesquisados. As análises mostraram que, apesar da confiança poder ser definida como um construto multidimensional, ela deve ser operacionalizada como um construto unidimensional direcionado pela competência e credibilidade.

Este estudo contribui para a prática sugerindo formas de aumentar a confiança interorganizacional para aumento da performance.

Palavras chave: interorganizacional, confiança, comprador-fornecedor

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SUMMARY

1 Introduction

Research on trust has been conducted for a long time and through different perspectives such as economics (Dyer & Chu, 2000; Gulati, 1995; Williamson, 2008), sociological (Blau, 1965; Deutsch, 1958; Granovetter, 1985) and relationship marketing (Morgan& Hunt, 1994; Ring & Ven, 1994; Swan & Nolan, 1985), and it seems to exist certain unanimity that trust is a mechanism based on credibility and expectation, and that the actions from the partner organization will have a positive outcome to the relationship (E. Anderson & Weitz, 1989; J. C. Anderson & Narus, 1990; Blau, 1965; Deutsch, 1958; Doney & Cannon, 1997; Dyer & Chu, 2000; Ganesan, 1994; Morgan& Hunt, 1994; Ring & Ven, 1994; Rousseau, Sitkin, Burt, & Camerer, 1998; Swan & Nolan, 1985; Zaheer, Mcevily, & Perrone, 1998; Zaheer & Venkatraman, 1995).

Moreover, central to the success of supply chain management of entire industries is the effective management of buyer-supplier relationships, and many researchers suggested that supply chain partners should consider interorganizational trust (IOT) as a core factor to create, develop and maintain close relationship among supply chain partners (Ambrose, Marshall, & Lynch, 2010; Autry & Golicic, 2010; Ha, Park, & Cho, 2011; Kwon & Suh, 2004).

Interorganizational trust describes the extent to which organizational members have a collectively-held orientation toward the partner firm (Zaheer et al., 1998), and the positive relationship between IOT and performance is also well documented by the three more adopted theoretical perspectives on this subject (Blomqvist, 1997; Delbufalo, 2012; Seppänen, Blomqvist, & Sundqvist, 2007): Transaction Cost Economics (TCE), Social Exchange Theory (SET) and Relationship marketing (RM).

According to TCE, higher levels of interorganizational trust have a positive effect on firm performance because it reduces opportunism and enables more informal governance, which ultimately leads to lower transaction, negotiation and measurement costs (Corsten, Gruen, & Peyinghaus, 2011; Grover & Malhotra, 2003; Heide & John, 1988; Poppo & Zenger, 2002; Rindfleisch & Heide, 1997; Williamson, 2008; Zaheer & Venkatraman, 1995).

A basic assumption in SET is that transaction partners enter into an exchange with the expectation that it will be rewarding either economically or socially (Autry & Golicic, 2010;

Blau, 1965; Cropanzano & Mitchel, 2005, Emerson, 1976; Lambe, Wittmann, & Spekman, 2001). According to SET, as the length of a relationship increases over time, bonds of attraction become embedded in the relationships, generate trust and lead to behaviors that discourage opportunism. As a consequence, transactors may rely on governing mechanisms based on social sanctions instead of formal contracts to protect their interests (Dyer & Chu, 2000; Granovetter, 1985). However, the relationship between length of relationship, trust and performance is not straight forward because instability of organizational personnel, occurrence of problems, stage of the relationship and excess of trust may weaken efficiency (Ambrose et al., 2010; Doney & Cannon, 1997; Dyer & Chu, 2000; Jap & Anderson, 2003; Tian, Lai, & Daniel, 2008; Villena, Revilla, & Choi, 2011).

In RM, commitment and trust are antecedents of long term partnerships, and organizations gain higher benefits from engaging in strong customer relationships rather than weak-linked short term transactions because they develop long term partnerships and common strategic orientation that fosters cooperation and risk taking (Anderson & Narus 1990; Hingley 2005; Morgan and Hunt, 1994, Morgan & Smircich 1980).

In order to conduct a literature review on the dimensions of trust, the different perceptions between buyers and suppliers, and the relationship between trust and performance, a search methodology was adapted from a systematic review on manufacturing, organizational and supply chain agility conducted by Gligor & Holcomb, (2012). A total of 87 articles were collected and fully reviewed and are listed in the reference section (the list has 103 articles including the ones specific to the research methodology).

The review of these articles revealed three important gaps: (1) the ambiguity that still exists in defining and measuring the dimensions of trust (Doney & Cannon, 1997; Lado, Dant, & Tekleab, 2008; Lai et al., 2012; Svensson, 2001), (2) the theoretical limitations on the similarities and differences on how the dimensions of interorganizational trust are perceived by buyers and suppliers (Ganesan, 1994; Svensson, 2001; Whipple & Frankel, 2000), and (3) the scarce research in the service industry and in emerging economies aside Asia (Delbufalo, 2012; Lee & Johnsen, 2012).

Trust has been operationalized as a multi-dimensional construct and more than 20 different dimensions have been used to make it up (Seppänen et al.2007). The ambiguity in the

definition and measurement instruments of these dimensions is seen because they have been sometimes referred as different terminologies for the same dimension, and sometimes as different dimensions with similar terminologies. For example, credibility, integrity and honesty have been referred in terms of an expectancy that the partner's word or written statement can be relied on (Doney & Cannon, 1997; Kumar, Scheer, & Steenkamp, 1995; Lai et al., 2012). At the same time, credibility and reliability have also been referred in terms of competence, which is the belief that a trading partner is expert, reliable and has the needed capabilities to perform the expected task and fulfill the promised role obligations (Komiak & Benbasat, 2004; Zacharia, Nix, & Lusch, 2011; Ganesan, 1994; Andersen & Kumar, 2006). Therefore, to conduct this study it will be necessary to clearly determine which dimensions will be used and how they will be defined.

The theoretical limitations of research that examine the similarities and differences in the perception of trust between buyers and suppliers were found by analyzing articles that empirically studied the relationship between trust and performance considering both perspectives (buyer and supplier) and measuring trust as a multi-dimensional construct. Articles that fulfilled these two criteria (Ganesan, 1994; Johnston, McCutcheon, Stuart, & Kerwood, 2004; Svensson, 2001; Whipple & Frankel, 2000) only suggest that buyer and suppliers have different perceptions of the relationship or that the constructs may be of different importance, but did not examine the different perspectives on the dimensions of trust in interorganizational relationships. In neither it was clear which dimensions of trust contribute to alliance success nor have the specific objective of comparing the relative significance of different dimensions of trust with performance.

Articles that examined both perspectives but modeled trust as a single-dimensional construct cannot provide insights about the different dimensions of trust (Ambrose et al., 2010; Barnes, Naudé, & Michell, 2007; Kwon & Suh, 2004; Liu, Luo, & Liu, 2009; Nyaga, Whipple, & Lynch, 2010; Zaheer et al., 1998). Articles that considered only one perspective but modeled trust as a multi-dimensional construct (Z. Chen, Huang, & Sternquist, 2011; Ha et al., 2011) allowed only to examine how significant the dimensions may be in a relationship, but they did not use the same dimensions of trust and therefore it was not possible to compare their relative relevance or the different perspectives.

Finally, it is still necessary to investigate interorganizational trust in service industry contexts because empirical research on trust and supply chain management appear to be concentrated in few manufacturing industry sectors or physical goods (Blomqvist, 1997; Burgess, Singh, & Koroglu, 2006; Delbufalo, 2012; Seppänen et al., 2007). In the few examples of research in services, Nyaga et al. (2010) had 95% of their sample in industrial or retail industry and only 5% in transportation, and Ross et al. (1997) examined insurance firms and their agents. Other articles that seemed to research supply chains focused mainly on industries that handle physical goods, such as Hingley (2005) that investigated the nature and management of power in the UK fresh food channel, Lee & Johnsen (2012) that investigated both the smaller supplier and larger customer in the Taiwanese electro-electronic business, Donada & Nogatchewsky (2006) that worked on lord and vassal relationships in the agri, pharma and air industries, Gulati & Sytch (2007) in the auto industry and Ambrose et al. (2010) that surveyed information and communication technology equipment manufacturers.

The motivation for proposing another study in such investigated area came from more than 25 years of experience that the researcher has in designing, implementing and managing logistics operations in different industries. Practical examples on how trust impacts performance associated with the gaps found in the literature made the researcher feel the need to theoretically understand if buyers and suppliers have different perceptions of trust and the consequences of the differences to performance. This is in line with Gulati (2007), who argumented that the starting point for all research must be subjecting hunches to managerial insight, probing more deeply into the problems, and naturally aligning academic and practice interests. Another reason was that the researcher felt that a more practical direction was needed to help managers apply this understanding to improve the logistics performance of their firms.

For example, when working to improve field service operations for a telecom company, the lack of trust between the supplier of such services and his client was impeding the implementation of improvement initiatives in the operation, but it was not clear in which dimensions trust were lacking and where the companies could focus to improve trust and unleash the roadblocks. In an opposite example, when implementing a new logistics model in a retail bank, the existence of high trust between the companies allowed to quickly propose, test and solve critical issues, reducing the operational ramp-up time and quickly stabilizing the operation. Curiously, this same supplier had a low trust relationship with another similar

client, and as a result did not suggest nor test different solutions to improve this client´s operation. In this case, it was unclear which dimensions of trust were contributing to the success or failure of these relationships. The researcher also observed that relationships are often defined based on a snapshot of an operation in a particular moment, and with time trust declined, friction occurred, performance suffered and the supplier was ultimately replaced at a large transition cost for both companies. This seemed to be contrary to common sense, where trust and relationship strength should increase with time, but again it was not clear which dimensions of trust could be addressed to sustain a relationship and avoid such consequences.

This research aims to address these gaps by answering the following question:

How do buyers´ and suppliers´ perspectives of the dimensions of trust differ?

More specifically, it has the following objectives:

- Examine the impact of each dimension of trust on logistics performance from two perspectives: the buyer and the supplier
- Investigate the perceived similarities and differences of the dimensions of trust from the same two perspectives.

To attend these objectives, this research will be based in a survey in the Logistics industry in Brazil, having trust measured as a multi-dimensional construct and considering the buyer and supplier perspectives. A survey is entailed in this case because the dimensions and scales to measure trust are well developed and do not need to be created, but tested, to extend the existing theory (Eisenhardt & Graebner, 2007; Gulati, 1995; Seppänen et al., 2007). Two independent samples and mirrored questionnaires will be required for the survey, one for suppliers and another one for buyers, and the unit of analysis will be the buyer – supplier relationship.

The Logistics industry was selected for this study because: (i) it´s a service, (ii) logistics is relevant because about half of total logistics expenditures in Western Europe and the United States are directed toward outsourced services and globalization of operations will only reinforce this trend (Moorman, Deshpandé, & Zaltman, 1993), and (iii) the researcher´s expertise in this area allow to naturally align academic and practice interests without sacrificing rigor (Gulati 2007).

It is expected that this research will bring managerial and academic contributions. By understanding buyers and suppliers´ perspectives of the dimensions of trust, managers may focus on specific areas of their relationship with a trading partner to increase outsourcing performance.

This research may also bring a different perspective by combining the different dimensions of trust in a single survey, which is different from analyzing trust as a single dimensional construct or assessing trust as one of several antecedents to performance. Conducting a survey using existing constructs and scales will also contribute to the literature by testing if previous relationships between the dimensions of trust and performance can be replicated in a different environment such as services and other emerging markets.

This document has the following structure: section 2 reviews the literature, including the definition of trust, the relationship between interorganizational trust and performance, the dimensions of trust that will be considered in this study and the differences in buyer and supplier´s perceptions on trust. Research hypothesis will be proposed along the literature review. The research methodology is then detailed in section 3, including sample and data collection procedures, and data analysis procedures. References and appendixes are presented in sections 4 and 5.

2 Literature review

The objective of this section is provide a comprehensive view of interorganizational trust, and is organized in seven sections: (2.1) explain the process by which articles were identified and selected, (2.2) identify the theoretical perspectives that will be used in this study, (2.3) define interorganizational trust, (2.4) explains the relationship between trust and performance, (2.5) shows dimensions used to measure trust in empirical research, (2.6) shows how buyers and suppliers perceive trust. Section 2.7 summarizes the literature review, and research hypothesis are formulated along the review.

2.1 Article identification and selection process

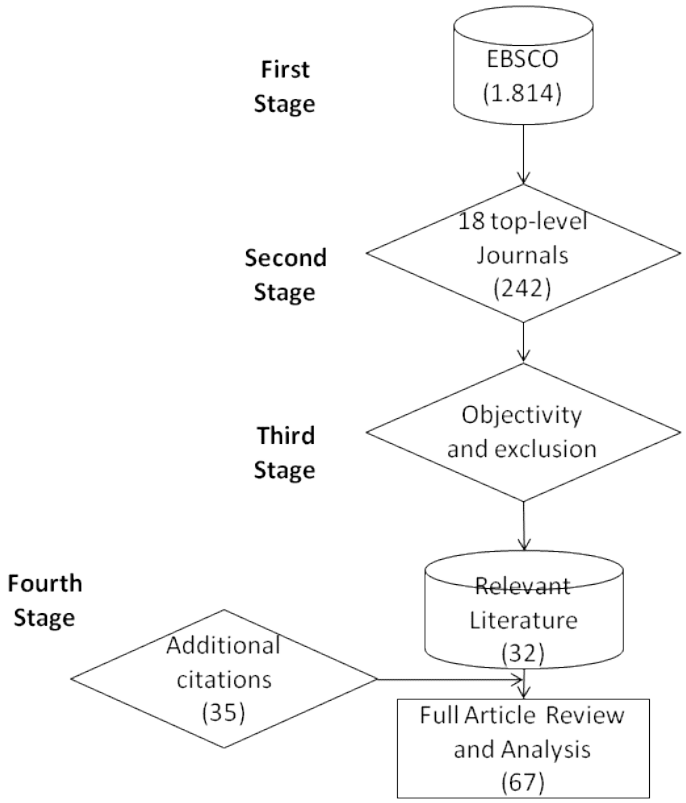
In order to identify and select articles for this research, a search methodology was adapted from a systematic review on manufacturing, organizational and supply chain agility conducted by Gligor & Holcomb, (2012), and followed a four stage approach (a graphical illustration of this process is presented in Figure 1).

In the first stage, eleven key terms were developed to identify and select articles in the EBSCO Business Source Premier database, including "interorganization*", "inter-organization*", "literature", "trust", "review", "buyer-seller", "buyer supplier", "relationship*", "performance", "supply chain*", "services", "logistics" and "b2b". Those terms were amended to create search strings with the Boolean connector AND in the title of the articles, leading to 1.814 publications. A similar process was applied in Portuguese to select articles in two specific top journals published in Brazil: RAE and RAC.

In a second stage, a only articles published in 18 top-level international journals and the 2 local journals were selected, resulting in 242 articles. These journals were identified based on two criteria: a list of 17 journals in the "management" category from the 2013 JCR Social Science Edition related to management, marketing or operations and with an impact factor greater than 1.8 were identified. Then, this list was confronted with a list of what the academic institutions actually use in evaluating faculty research (Meredith, Steward, & Lewis, 2011), and only one additional journal (Decision Sciences) needed to be added. The complete

list of top-level journals and number of articles that were selected for deeper analysis can be found on Appendix 1.

Figure 1: Article identification and selection process



Note: ( ) indicate the number of articles in each phase
Source: Adapted from Gligor & Holcomb, (2012)

In a third stage, the objectivity of the assessment was assured by reading the titles of all 242 articles to determine substantive context and indicate if they were related to this study. For example, "Examining supply chain relationships: Do buyer and supplier perspectives on collaborative relationships differ?" (Nyaga et al., 2010), or "Measuring inter-organizational trust—a critical review" (Seppänen et al., 2007) were selected, while "Perceived Buyer Confidence in Buyer-Supplier Relationships" (Chao, Emmanuel; Kato, M. Paul, 2014), or "Comply or defy? An empirical investigation of change requests in buyer-supplier relationships" (Crosno, Jody L.; Dahlstrom, Robert; Manolis, Chris, 2015) were discarded. In this stage, article abstracts were read in the case the title did not provide a clear context indication. This lead to an initial list of 32 unique articles that were read and analyzed in detail.

Given that not all articles are accessible on EBSCO database or may be relevant even if they used other terms in their titles or were published in other journals, in a fourth stage the researcher traced and reviewed citations from the 32 papers during the deeper analysis to find additional relevant work. The inclusion for new articles through citations and revision ceased when theoretical saturation, or the point at which incremental learning is minimal because the researchers are collecting information seen before, was reached (Eisenhardt, 1989). At the end of this stage 35 new articles were added.

As a result, 67 articles were collected and fully reviewed at the end of the above process. Finally, 20 articles specific to the theoretical perspectives (TCT, SET and Marketing Channels) were added, leading to a total of 87 articles fully analyzed in the literature review. The reference section lists 104 articles because 17 articles specific to the research methodology were added.

2.2 Theoretical perspectives used in the literature review

Within the 87 reviewed articles, three comprehensive reviews about measurement and operationalization of trust were used to define which theoretical perspectives should be considered in the literature review: Blomqvist (1997) analyzed how trust is approached and defined in various disciplines, Seppänen et al. (2007) evaluated the advancements and setbacks in terms of measuring inter-organizational trust, and Delbufalo (2012) focused on inter-organizational trust outcomes in supply chains.

Table 1: Summary of articles examined in the reviews

Author	Year range of articles	Number of Articles	Unique Articles	% of articles using more than one theory
Blomqvist (1997)	until 1994	16	16 (100%)	0%
Seppänen et al. (2007)	1994 - 2003	15	9 (60%)	100%
Delbufalo (2012)	1990 - 1994	2	1 (50%)	50%
	1994 - 2003	26	14 (53%)	38%
	2003 - 2010	28	28 (100%)	46%
Total		87	67	58%

Source: Author analysis of selected reviews

These three reviews were selected due to their relevance: they cover 25 years of publications ranging from seminal studies such as psychological work on interpersonal trust conducted by

Deutch (1958) to articles published in 2010 and 77% of the examined articles (67 out of 87) were unique (not repeated among the reviews), even considering the year range (or date overlap) of the articles (Table 1).

Table 1 also shows that nearly 50% of the articles are based on more than one theoretical perspective, except for Blomqvist (1997) that classified the articles based on only one theoretical discipline (thus the 0%). This may be an indication that it is necessary to examine more than one theoretical perspective to achieve a comprehensive view of trust, and that direction will be followed in this study.

According to these reviews (Table 2), the more adopted theoretical perspectives are the Social Exchange Theory (SET), Transaction Cost Economics (TCE) and Relationship marketing. These perspectives will be the foundation of this literature review.

Table 2: Theoretical approaches used in the reviewed articles

	Theoretical approach						
Author	Social Exchange Theory (SET)	Transaction Cost Economics (TCE)	Relationship marketing	Relational View Theory (RVT)	Resource Dependence Theory (RDT)	Resource Based View (RBV)	Other theories
Blomqvist (1997)	8	4	8	0	0	0	0
Seppänen et al. (2007)	5	7	5	4	2	1	6
Delbufalo (2012)	29	25	4	4	6	4	8
Total	42	36	17	8	8	5	14

Source: Author analysis of selected reviews

2.3 Definition of Trust

The objective of this section is to synthesize how trust has been defined in previous research, and define how it will be operationalized in this study.

2.3.1 The elements of Trust

Researchers across different disciplines have published substantive work proposing various phrases to define trust (Table 3), and it seems that trust can be defined based on four common elements.

First, trust can be seen as a mechanism of "credibility" or "reliability" and it has been cited under different definitions such as one party keeping promises (Blau, 1965), fulfilling prior requirements, outcomes or obligations (Ring & van de Ven, 1994; Zaheer & Venkatraman, 1995), avoiding failure that may cause problems(Swan & Nolan, 1985), and encompassing anticipation, stability and consistency (Ganesan, 1994; Zaheer et al., 1998). In a business context it means fulfilling what is considered a good service, which can be measured in terms of quality or on-time delivery, for instance.

Table 3: Example of the phrases used to define trust

Perspective	Author	Definition used and component words (in bold)
Social	Deutch, 1958	"An individual may be said to have trust in the occurrence of an event if he expects its occurrence and his **expectation** leads to behavior which he **perceives** to have greater negative motivational consequences if the expectation is not confirmed than **positive** motivational consequences if it is confirmed."
	Blau, 1965	"Parties can gradually build trust in each other through social exchange **demonstrating** a capacity to **keep promises and showing commitment** to the relationship."
	Dyer and Chu, 2000	"one party's confidence that the other party in the exchange relationship will not exploit its vulnerabilities"
	Doney and Cannon, 1997	"perceived **credibility** and **benevolence** of a target of trust"
	Rousseau et al, 1998	"Trust is a psychological state comprising the intention to accept vulnerability based on upon positive expectations of the intentions or behavior of another"
Economic	Norderhaven, 1992	"Trust denotes the **willingness** to **engage** in a transaction in the absence of adequate safeguards."
	Zahher 1995; 1998	"The expectation that an actor can be relied on to fulfill obligations, will behave in a predictable manner, and will act and negotiate fairly when the possibility for opportunism is present"
Relationship Marketing	Swan, 1985	"The customer **believes** that what the salesperson says or promises to do can be **relied** upon in a situation where the failure of the salesperson to be reliable will cause problems for the customer."
	Anderson and Weiz, 1989	"One party's **belief** that its needs will be **fulfilled** in the future by the actions undertaken by the other party."
	Anderson and Narus, 1990	"The firm's **belief** that another company will perform actions that will result **in positive outcomes** for the firm, as well as **not take unexpected actions** that would result in negative outcomes for the firm."
	Morgan and Hunt, 1994	"One party has **confidence** in an exchange partner's reliability and integrity."
	Ganesan, 1994	"Trust is the **willingness** to rely on an exchange partner in whom one has **confidence**"

Source: Author analysis

The second element is that trust is uncertain and based on a positive expectation (Deutsch, 1958; Rousseau et al., 1998); willingness and belief (Anderson & Weitz 1989; Anderson & Narus 1990; Swan & Nolan 1985; Zaheer & Venkatraman 1998); confidence (Dyer & Chu, 2000; Ganesan, 1994; Morgan& Hunt, 1994) or perception (Doney & Cannon, 1997) from one party to another.

The third element refers to the actual actions that are institutionalized between the partner organizations through their practices and routines (Deutsch, 1958). They can be tangible, such as transactions (Noorderhaven, 1992), negotiations (Zaheer et al., 1998) and actions (E. Anderson & Weitz, 1989), or intangible such as specific situations (Swan & Nolan, 1985) norms, behaviors or intentions (Dyer & Chu, 2000; Rousseau et al., 1998) among the involved actors. In other words, an expectation is fulfilled by means of events.

The fourth and last element implies that the result of actions and events produce a result to the relationship, which can be in the form of consequences (Deutsch, 1958); commitment (Blau, 1965); safeguards (Noorderhaven, 1992); problems (Swan & Nolan 1985), psychological state (Rousseau et al., 1998) or exploitation of one´s vulnerabilities (Dyer & Chu, 2000). Positive results will lead to the fulfillment of the relationship and enable trust.

Therefore, it may be inferred that, although there is large variety of definitions for trust, it seems to exist certain consensus that trust it is a social mechanism based on the credibility and expectations that the actions between the partner organizations will have a positive outcome to their relationship.

2.3.2 The operationalization of trust in academic research

Trust can be operationalized as a reciprocal concept, being potentially a cause, a mediating variable, or an effect, and it is the author´s hypothesis in the study and not the theoretical perspective (SET, TCE or MKT) that account how it is operationalized. Trust as a cause has been considered as a predictor of successful negotiation and conflict resolution (Deutsch, 1958), a factor that lowers transactional, governance and conflict resolution (Dyer & Singh, 1998; Williamson, 2008; Zaheer et al., 1998), or a factor that has significant influence on collaborative behaviors (Ha et al., 2011; Johnston et al., 2004).

Trust has been theorized as a variable that mediates successful relationships instead of independent antecedents of outcomes (Morgan & Hunt 1994), or mediates between collaborative activities and relationship outcomes (Nyaga et al., 2010), or mediates between strong ties and receipt of useful knowledge in dyadic exchanges (Levin & Cross, 2004).

Trust can be a consequence of the greater interdependence with alliance partners (Dyer & Chu, 2000; Dyer & Singh, 1998; Kumar et al., 1995; Teece & Pisano, 1994), or become embedded in organizations due to relationship history and repeated positive outcomes of interactions (Ambrose et al., 2010; Dyer & Chu, 2000; Granovetter, 1985).

Finally, trust can also have an interdependence perspective with time. An empirical study (Poppo et al. 2008) showed that expectations of continuity play a central role in generating interorganizational trust, while past interactions play a facilitating role in producing trust. In other words, after time the direct effect of prior history on trust is no longer positive and the relationship becomes mediated by expectations of continuity.

Considering that, in this research interorganizational trust will be operationalized as a cause rather than a consequence or mediating variable because the objective is to examine how it impacts logistics performance.

2.3.3 The multidimensional aspect of trust

There is an ongoing debate on the multi-dimensionality of trust around three different research streams on how trust should be operationalized and measured: as a multidimensional construct defined and measured by non dominant theoretical dimensions, as a construct based only on two dominant theoretical dimensions, or as a single global construct (Table 4).

The literature provides examples of empirical studies that have reached discriminant validity when modeling trust in two dimensions, although no standard definition exists for these dimensions as the following examples on benevolence, credibility and dependability will show: Ganesan (1994) developed a model to test long-term orientation in a buyer/seller relationship and conceptualized trust as credibility and benevolence, and found that they are independent but correlated constructs. Z. Chen et al. (2011) built on Ganesan (1994) work

and operationalized trust with the same two dimensions (credibility and benevolence) to study trust in the context of guanxi practice and obtained similar results. Johnston et al. (2004) conceptualized trust in two dimensions (benevolence and dependability) to study the effects of supplier trust on performance and found that that they are relatively distinct.

Table 4: Streams on how trust is operationalized

Research stream	Examples of Dimensions	References
No standard definition	benevolence, credibility, honesty and dependability as different constructs	Z. Chen et al. (2011); Doney & Cannon (1997); Ganesan (1994); Johnston et al. (2004); Kumar et al. (1995)
Two dominant constructs	Affective (i.e. goodwill) and Calculative (i.e. competence, deterrence, credibility)	Andersen & Kumar (2006); E. Anderson & Weitz (1989); Donada & Nogatchewsky (2006); Dyer & Chu (2000); Gulati (1995); Ha et al. (2011); Ring & van de Ven (1994); Seppänen et al. (2007); Zaheer & Venkatraman (1995)
One dimensional and global measurement	Combine honesty, reliability and benevolence in one single construct	Corsten et al. (2011); Kwon & Suh (2004); Medlin & Quester (2002); Seppänen et al. (2007); Zaheer et al. (1998)

Source: Author analysis

However, there are also examples of studies that modeled trust in two dimensions but did not find discriminant validity. Contrary to Ganesan (1994) and Z. Chen et al. (2011), Doney & Cannon (1997) examined trust in Buyer-Seller relationships and found that the same two dimensions of trust (benevolence and credibility) are highly correlated and could not discriminate between them. Kumar et al. (1995) found convergent validity when trust was modeled in two constructs, benevolence and honesty, but their discriminant validity and hypothesis test only discuss trust as a construct, indicating that at some point of their study these dimensions were combined.

In a second stream, scholars suggest that trust is a multi-dimensional construct but with only two dominant theoretical dimensions. The first is related to affective aspects of the relationship and is often measured as goodwill (Ring & Van de Ven, 1992) or affective trust (Andersen & Kumar, 2006; Ha et al., 2011; Seppänen et al., 2007). The second is more related to measurable aspects of the relationship, such as confidence, credibility or predictability of a partner, and is often measured as competence (E. Anderson & Weitz, 1989; Blomqvist, 1997; Donada & Nogatchewsky, 2006; Ha et al., 2011; Seppänen et al., 2007), deterrence trust (Gulati, 1995) or calculative trust (Dyer & Chu, 2000; Tian et al., 2008; Zaheer & Venkatraman, 1995).

The third stream of research argue that inter-organizational should be treated as a one-dimensional, global measure because of the difficulties in its operationalization and measurement (Medlin & Quester, 2002; Seppänen et al., 2007). Examples of articles that defined trust in more than one dimension and measured in a global scale are Zaheer et al. (1998) with fairness and reliabilily; Kwon & Suh, (2004) with honest, trustfull, reliable and benevolent, and Corsten et al.(2011) with honesty and benevolence. Interestingly, these articles did not explain the reasons for using a single dimensional scale despite of defining trust as a multidimensional construct.

Based on above discussion it is possible to perceive that several different dimensions have been used to operationalize trust, but there is a lack of studies that discuss the multidimensionality of trust in a same empirical model, and this is one additional gap that this research will address.

2.4 Interorganizational trust and performance

This section will provide an understanding on the relationship between trust and performance based on the 87 reviewed articles and through each of the 3 proposed theoretical perspectives: Transaction Cost Economics (TCE), the Social Exchange Theory (SET) and Relationship marketing. A synthesis of these perspectives will be presented at the end of this section.

2.4.1 Trust and performance in the economic perspective

The economic perspective was initially supported by the Transaction Cost Economics (TCE) that emerged on the Works of Coase (1937) and Williamson (1981, 2008). According to this theory, economic exchange is conducted by "transactions" (or "units of exchange"),there is a cost to conduct such transactions, and the "firm" is viewed as a governance structure that supports the system. Every transaction has an economic cost (the cost of running the system) and firms will conduct an activity internally through hierarchical governance as long as the transaction costs are lower than conducting the same transaction in the market. In other words, the greater the transaction costs, the more hierarchical the contract will be (Coase, 1937). While some authors have used the term governance to explain boundary choices on a

structural level (Verwaal, Commandeur, & Verbeke, 2008; Williamson, 1981), others have used it to explain decisions within structures, processes or spanning-agents (Andersen & Kumar, 2006; Corsten et al., 2011; Mellewigt, Madhok, & Weibel, 2007; Narayandas & Rangan, 2004).

TCE is based on two human and three environmental factors (Heide & John 1988; Rindfleisch & Heide 1997; Zajac & Olsen 1993; Grover & Malhotra 2003). The human factors are bounded rationality, which is the result of the cognitive limitations that decision makers have to receive, store, evaluate and consider all possible alternatives to make rational and effective decisions. The second human factor is opportunism, which assumes that, given the opportunity, individuals will unscrupulously seek to attend their self-interests at the expense of the other through behaviors such as cheating, lying, and subtle forms of violation of agreements.

One environmental factor is asset specificity, defined by the investment in specific human (e.g. training people to a certain partner), physical (e.g. investment in tools and equipment to support a specific partner), and not tangible (e.g. customized processes to support an operation) relationship resources required to perform an exchange, and that have limited or no value outside the specific transaction. The other environmental factors are environmental uncertainty (e.g. unpredictability of new technologies, demand volume and variety), and behavioral uncertainty that is related to the difficulty in anticipating and comprehending the behavior and decisions made by the individuals involved in the transaction.

The combination of these factors results in exchange hazards, and legal contracts are the most common safeguard governance mechanism employed in western economies to these hazardous exchange (Dyer, 1997), which ultimately are costly to be crafted, updated and monitored and increase transaction costs. Specific assets and opportunism lead to the necessity to create safeguarding mechanisms to reduce switching costs and exit barriers of the investments for when a relationship is terminated, and therefore reduce the likelihood of opportunistic behavior (Rindfleisch & Heide 1997; Zajac & Olsen 1993; Heide & John 1988; Poppo & Zenger 2002; Zaheer & Venkatraman 1995). For example, a service provider or a client that invests in specific equipment and training may have difficulty in replacing them in the case a relationship is terminated, and they may exploit the situation by demanding several concessions from the other party. To safeguard against this behavior, managers may also

adopt contracts that specify the required actions and conditions of contractual breach and a framework for resolving disputes.

Uncertainty and bounded rationality impact negotiation costs (ex-ante) because of the complexity and difficulty in anticipating, adapting and formalizing efficient contracts or agreements to possible changing situations (Heide & John, 1988; Zajac & Olsen, 1993). For example, a company operating in high demand uncertainty would require the parties to incur considerable transaction costs associated with ongoing negotiations to specify a comprehensive contingent contract unless the complexity and change could be predicted with precision (Grover & Malhotra, 2003).

Opportunism, bounded rationality and environmental uncertainty impact measurement and monitoring costs (ex-post) because when performance is difficult to measure parties have incentives to limit their efforts toward fulfilling the agreement. In this case, they may either limit resources to measure performance and realize lower performance, or spend resources to create more complex contracts or mechanisms that specify delivered service levels to guarantee that agreements are being followed and enforced (Poppo & Zenger, 2002; Rindfleisch & Heide, 1997). The interaction among these factors is not limited to these examples, for instance Grover & Malhotra (2003) empirically confirmed that bounded rationality and opportunism increase transaction costs under the conditions of high asset specificity and high uncertainty, while Lai et al. (2012) demonstrated that in highly uncertain environments partners are more likely to behave opportunistically regardless the other factors.

Relational trust can function as an effective substitute to complex contracts and lead to lower costs and increased performance because they enable balancing formal contracts with non-contractual, self-enforcing safeguards. As examples, a survey in the Information Systems (IS) industry conducted by Poppo & Zenger (2002) shows that, as contracts become increasingly customized and more complex, the use of more relational norms also increase as managers develop more relational governance, leading to better exchange performance; Zaheer & Venkatraman (1995) showed that in the insurance industry trust serves as a substitute for the need for control; Corsten et al. (2011) demonstrated that suppliers who identify with buyers in the European automotive industry build trust and are more likely to deploy relation-specific investments and exchange information more informally about unexpected events or changes; and a study on outsourced HR functions (Mellewigt et al. 2007) proposes that trust is at once

a substitute and a complement that moderates the relationship between asset specificity and contractual complexity.

In summary, under the TCE perspective the combination of bounded rationality, opportunism, asset specificity and uncertainty results in exchange hazards, and the most common safeguard to these hazardous exchanges are complex contracts that increase transaction costs because they are complex to de crafted and monitored. Trust can function as an alternative and more effective relational, self-enforcing safeguard that reduces the potential for opportunistic behavior, leading to lower transaction costs and higher performance.

2.4.2 Trust and performance in the social perspective

One limitation in TCE is the focus on minimizing costs from only one point of view (the buyer) and the absence of a relationship between trust, opportunism and the dynamics of relations that may create value (Zajac & Olsen, 1993). The Social Exchange Theory (SET) is based on social mechanisms to address this limitation.

SET´s basic assumption is that the actors involved in an exchange enter into and maintain relationships with the expectation that acting in a trustworthy manner will be rewarding either economically or socially through reputation and prestige (Autry & Golicic, 2010; Blau, 1965; Cropanzano & Mitchel, 2005). In other words, SET can be based on two premises: (1) exchanges involve economic and/or social outcomes (2) that over time increase firms' trust and commitment of each other and lead to relational norms that govern the exchange relationship (Emerson, 1976; Lambe et al., 2001).

The first premise suggests that dyadic business relationships often have a strong non-economic component due to the tendency for commercial relationships to be interwoven with personal ones (Zaheer & Venkatraman, 1995). In this context, the social embeddedness of economic actions is noteworthy (Granovetter, 1985), where embeddedness refers to the degree of social connectedness among the exchange parties:

"The embeddedness argument stresses the role of concrete personal relations and structures (or 'networks') of such relations in generating trust and discouraging malfeasance." (Granovetter, 1985, p. 490).

In premise two, positive outcomes and relational norms are time dependent, meaning that embeddedness may arise from the length of a relationship. It is expected that, as the duration and intensity of interactions between transactors increase, bonds of attraction develop embedded relationships that generate trust and lead to expected behavior and discourage opportunism and malfeasance (Granovetter, 1985). In the same direction, Dyer & Chu (2000) suggested that embeddedness is not only a result of the development of personal relationships over time, but it also require a high degree of stability of organizational personnel at both organizations to produce relationship-based trust (embedded ties). For example, Ambrose et al. (2010) found that the perceptions of trust as an attitudinal dimension of buyer-supplier relationships are congruent because the respondents in their sample have been in the relationship for an extended length of time.

As a result, if a transaction is embedded within a broader reciprocal social relationship, then transactors may rely on governing mechanisms based on social sanctions such as withdrawal of respect, prestige, and/or banishment to protect their interests(Dyer & Chu, 2000). This lead to the same implication about other governance mechanism than formal contracts discussed in the previous section about TCE.

However, some studies also show that the relationship between relational norms, relationship length and performance is not always straightforward. Initially, Jap & Anderson (2003) pointed that the positive effects of trust may diminish when trouble occurs, maybe because more players examine or question the relationship. In this direction, Autry & Golicic (2010) examined the cyclical linkage between relationship strength and performance in buyer–supplier relationships, and observed that periodic fluctuations of complacency toward the relationship had an alternating pattern of stronger and weaker effects on performance over time.

More recently, Villena et al. (2011) considered the “dark side” of social capital in buyer-supplier relationships, suggesting that high trust and reliance on trust may weaken the efficiency of self-enforcing mechanisms. They analyzed value creation through three social

capital dimensions: the cognitive, related to the pursuit of common shared culture and goals; relational that refers to trust, respect, and friendship developed with time; and structural that refers to the impersonal configuration of linkages between parties. Although the results confirmed that the three forms of social capital have a positive relationship to strategic and operational performance, it also showed that structural and relational capital lead to an inverted curvilinear with performance. They suggested that, initially, the promotion of frequent, close social interactions allows access and exploitation of synergies that lead to superior performance, as additional social capital is accumulated there is a reduction in objectivity and more ineffective decisions that begin to outweigh the benefits.

In summary, the SET extends TCE´s perspective and provide explanations on how trust can function as an effective relational, self-enforcing safeguard against exchange hazards. Following the premise that business relationships have a strong non-economic component, over time trust becomes embedded in the relationships, leading to commitment and more relational governance that discourage opportunism. However, it is also possible that high trust may weaken the efficiency because more ineffective decisions can be made as social capital is accumulated or trust may diminish when problems occur.

2.4.3 Trust and performance in Relationship marketing

While TCE emphasizes that trust lowers transaction costs to explain the nature of governance in interfirm relationships and SET explains how trust can function as a relational safeguard to govern the exchange process against exchange hazards, RM refers to all marketing activities directed toward establishing, developing, and maintaining successful relational exchanges (Morgan & Hunt, 1994).

According to Morgan & Hunt (1994) and Selnes (1998), a common accepted definition for relationship marketing is the one provided by Grönroos (1994 p.6):

‘‘Relationship Marketing is to establish, maintain, and enhance relationships with customers and other partners, at a profit, so that the objectives of the parties involved are met. This is achieved by a mutual exchange and fulfillment of promises”.

This means that buyers have to make decisions regarding if a relationship should be established (first time purchase), continued (repurchase), enhanced in scope (increase commitment with the supplier) or terminated. One underlying assumption in RM is that organizations do not act alone, but firms gain higher benefits from engaging in strong customer relationships rather than attempting to profit via larger numbers of weak-linked short term transactions (Morgan and Hunt, 1994). For example, social capital and transaction cost theories were applied in a study in the construction industry to provide evidence that relationship strength influences performance, and that this relationship is associated in the form of an upward deviation-amplifying spiral (Autry & Golicic, 2010). Research on mutuality in the textile industry (Johnsen & Ford, 2008) also indicated that small suppliers have similar goals to their large customers, and both parties would adapt to maintain long-term development of the relationship; Ganesan (1994) indicated that dependence due to specific assets also plays a role in determining long-term orientation, although an element of trust is also necessary for parties to have long-term orientation.

Another assumption is that commitment and trust between exchange partners is an antecedent and underlying foundation of relational exchange and long term partnership orientation. It reduces perceived uncertainty, facilitates risk-taking behavior, fosters cooperative orientation and increases confidence that short-term inequities will be resolved over a long period (Anderson & Narus 1990; Hingley 2005; Morgan & Smircich 1980). For example, a study in high-technology markets (de Ruyter, Moorman, & Lemmink, 2001) showed a positive impact on affective commitment and trust in supplier–customer relationships, which in turn lead to an intention to remain in a relationship. Ganesan (1994) dyadic analysis on retailers showed that satisfaction with prior relationship outcomes increases trust and commitment in a relationship; Anderson & Weitz (1989) found that older and established dyads are more trusting and possess built-in inertia to continue the relationship.

A third assumption identified in the marketing literature is the characterization and transition of trust at different stages of a relationship. In a seminal work, Dwyer, Schurr, Oh, & Robert (1987) defined five stages of a relationship, where the first three (search and selection, defining purpose, and boundary definition) focus on developing the structure of a relationship, the fourth is centered in value creation, and the fifth is where stability is cemented by structural bonds, cooperation, and commitment. Jap & Ganesan (2000) suggested that the effectiveness of control mechanisms (e.g. relational norms and explicit contracts) to safeguard

against opportunism is contingent on the relationship phase, with explicit contracts being more effective in exploratory and decline phases and relational norms in maturity stages.

In summary, RM aims to identify, establish, maintain and enhance relationships with stakeholders at a profit. Strong long term relationships reduce perceived uncertainty, facilitates risk taking behavior and is an antecedent to relational exchange, leading to higher profits that could be obtained through weak-linked short term transactions. Trust is an underlying foundation in RM, and may have different characteristics depending on the relationship phase.

2.4.4 Synthesis: relationship between interorganizational trust and performance

TCE, SET and RM are three perspectives that view trust in a complementary manner. According to these perspectives, it is expected that interorganizational trust reduces uncertainty and opportunism, enables more informal safeguards and governance mechanisms, and creates longer term orientation between firms (Table 5).

Table 5: IOT and performance according to TCE, SET and RM

Theory	Relationship Between IOT and Performance	Limitations	Key References Used
TCE	Trust reduces opportunism, which enables more informal safeguards and reduce transaction costs	Consider only one point of view (the buyer) and the absence of a relationship between trust, opportunism and dynamics of relations	Heide & John, 1988 Rindfleisch & Heide, 1997 Williamson, 1981, Zaheer et al., 1998
SET	Over time, trust becomes embedded in relationships, reducing opportunism and enabling social governance mechanisms	Benefits of IOT can be negatively impacted by high levels of trust, organization instability or occurrence of problems	Blau, 1965 Emerson, 1976 Granovetter, 1985, Zaheer & Venkatraman, 1995
RM	Engaging in strong relationships create long term orientation towards the partner, reducing uncertainty, enabling risk taking and relational norms as control mechanisms	Trust may have different characteristics depending on the different phases of a relationship	E. Anderson & Weitz, 1989 J. C. Anderson & Narus, 1990 Morgan& Hunt, 1994

Source: author analysis

As trust increases, it is expected that the costs required to craft and monitor contracts become lower and risk taking becomes higher, leading to better performance. The complementarity of these perspectives is due to the fact that TCE focuses on the transaction, SET brings the notion of time and embeddedness and RM focus on long term relationships.

Based on the three theoretical perspectives that were revised, the following hypothesis will be entertained:
Hypothesis 1: Trust has a positive relationship with performance

2.4.5 Performance

Operational and logistics performance may be viewed as a subset of the larger notion of firm or organizational performance (Chow, Heaver, & Henriksson, 1994), and this section will define how performance will be measured by exploring the similarities and differences between operational and logistics performance.

A literature review of studies that addressed performance in five leading logistics journals between 1982 and 1992 (Chow et al., 1994) revealed that performance is a multi-dimensional construct, and defining "one best way" to measure it may be a futile exercise. The multi-dimensionality of performance was also supported by other reviews such as one conducted on the value delivered from buyer–supplier relationships over time (Terpend, Tyler, Krause, & Handfield 2008) and another that investigated different performance measurement systems (Tezza, Bornia, & Vey 2010).

Among the different performance measurements, quality, cost, speed/lead-time/cycle-time and delivery are cited in both operational and logistics literature, and found as the most frequently used measurements (Conceição & Quintão, 2004; Flynn, Huo, & Zhao, 2010; Schoenherr & Swink, 2012; Terpend et al., 2008; Villena et al., 2011; Zacharia et al., 2011). Others measurements such as flexibility (I. J. Chen & Paulraj, 2004; Ha et al., 2011), agility (Ha et al., 2011) and customer service (Daugherty et al., 2006; Zacharia et al., 2011) have also been cited but not as commonly as the previous ones.

On the other hand, operations and logistics do not adopt these performance measurements in the same manner (Table 6). While delivery and cost are common performance measurements

identified for both operational and logistics studies, quality and accuracy are more adopted in logistics, and flexibility and time are more adopted in operations (Ambrose et al., 2010; H. Chen, Tian, Ellinger, & Daugherty, 2010; Conceição & Quintão, 2004; Daugherty et al., 2006; Gassenheimer, Sterling, & Robicheaux, 1996; Ha et al., 2011; Nyaga et al., 2010).

Table 6: Number of times each performance measurements was cited in reviewed article

Dimensions	Total	Operational Performance	Logistics Performance
Delivery *	12	4	8
Cost *	10	4	6
Quality *	9	3	6
Time	8	3	5
Accuracy *	6	-	6
Flexibility	5	4	1
Agility	3	2	1
Visibility	3		3
Other	8	3	5

Source: Author analysis
* indicates measurements that will be used in this study

Based on that, in this research performance will be measured in terms of Logistics Performance, and will include the four more frequently cited measurements: delivery, cost, quality and accuracy. The definitions of these measurements will be further detailed.

Delivery has to be clearly defined because it can measure different attributes according to the desired goal, that can be in terms of time, speed or reliability. Time is measured by on-time delivery, which represents the amount or percentage of orders delivered in the correct or committed date (Ambrose et al., 2010; I. J. Chen & Paulraj, 2004; Chow et al., 1994; Gassenheimer et al., 1996; Nyaga et al., 2010; Schoenherr & Swink, 2012). Speed is measured by lead-time, which is the amount of time elapsed between a customer placing an order and having it received (Gassenheimer et al., 1996; Nyaga et al., 2010; Schoenherr & Swink, 2012), and reliability is measured by the consistency of a supplier (I. J. Chen & Paulraj, 2004). For this study, delivery will adopt on-time delivery, as is it has been found more frequently in the literature review.

The other measurements seem to be more straightforward. Cost has been widely used in logistics (Ha et al., 2011) and measures the cost of activities such as transportation, warehousing, packaging, order processing, customer service, procurement, and inventory

management. These costs can be measured either in terms of "cost per unit" or productivity standards (Ambrose et al., 2010; Dalstrom, McNeilly, & Speh, 1996).

Quality refers to the conditions in which an order has been delivered (Ambrose et al., 2010; Dalstrom et al., 1996), and include attributes such as orders delivered damaged or in a different condition that expected.

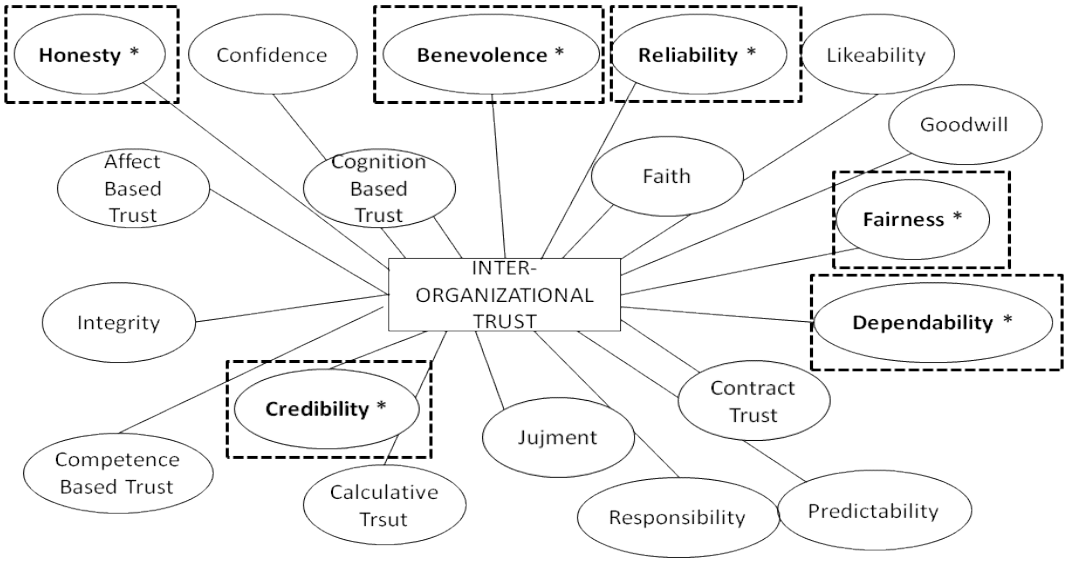
Finally, accuracy measures if an order has been correctly processed or fulfilled, or delivered in-full (Ambrose et al., 2010; Dalstrom et al., 1996; Gassenheimer et al., 1996)

2.5 The dimensions of interorganizational trust

This section will explain how the dimensions of trust have been used in empirical research on buyer-supplier relationships, and how they will be defined for this study.

Interorganizational trust has not been defined and measured in the same way, and several dimensions can be found when trust is operationalized as a multi-dimensional construct (Figure 2). For example, a literature review from Seppänen et al. (2007) found more than 20 different dimensions, Svensson, (2001) listed 22 different dimensions used to make up the construct, and Ha et al., (2011) mapped 13 different dimensions.

Figure 2: Overview of the dimensions of trust used in empirical research



* Indicate most commonly used dimensions found in this review
Source: Based on Seppänen et al., 2007

Despite this variety of dimensions, the literature indicates that it is possible to focus on a few dimensions to study trust as an antecedent to performance. While Seppänen et al., (2007) found that the number of dimensions in studies can vary from none to five, this review shows that studies have mostly used two dimensions (Table 7) to measure the relationship between interorganizational trust and its outcomes.

From the original list of 87 articles, 19 were empirical studies that investigated the relationship between trust and performance (Table 7) and showed that from the 13 different dimensions of trust previously mapped, 6 dimensions have most commonly been used (benevolence, credibility, honesty, reliability, fairness and dependability). This finding is consistent with a recent systematic literature review (Delbufalo, 2012) which showed that employing credibility and benevolence yields the highest correlations between inter-firm trust and relational outcomes (affective commitment and satisfaction), and employing reliability and integrity has a larger effect on performance.

Table 7: Overview of the dimensions used in empirical research

Author	Dimensions	Construct	Adapted from
Ganesan, 1994	Credibility Benevolence	Multi-dimensional	N/A
Doney and Cannon, 1997	Credibility Benevolence	Single-dimensional	N/A
Zaheer et al., 1998	Fairness Reliability Interorganizational	Single-dimensional	Rempel and Holmes, 1986
Whipple & Frankel, 2000	Character trust Competence trust	Multi-dimensional	N/A
Svensson, 2001	Reliability Honesty Competence Orientation Friendliness	Multi-dimensional	N/A
Kwon & Suh, 2004	Honesty Benevolence	Single-dimensional	Kumar et al, 1995
Johnston et al, 2004	Benevolence Credibility	Multi-dimensional	N/A
Mellewigt, Madhok, & Weibel, 2007	Benevolence Credibility	Single-dimensional	Developed a proxy
Barnes, Naudé, & Michell, 2007	N/A	Single-dimensional	N/A
Poppo et al., 2008	Reliability Predictability Fairness	Single-dimensional	Zaheer et. al, 1998
Lado, Dant, & Tekleab, 2008	Benevolence Credibility	Single-dimensional	Crosby et al, 1990; Rempel, Holmes, and Zanna, 1985

Table 7: Overview of the dimensions used in empirical research (continued)

Author	Dimensions	Construct	Adapted from
Tian et al., 2008	Ability Integrity Benevolence	Single-dimensional	Johnston et al, 2004
Gulati & Nickerson, 2008	Fairness Reliability Interorganizational	Single-dimensional	Zaheer et. al, 1998
Liu, Luo, & Liu, 2009	Honesty Benevolence	Single-dimensional	Kumar et al, 1995
Nyaga, Whipple, & Lynch, 2010	Benevolence	Single-dimensional	Doney& Cannon, 1997
Ambrose et al., 2010	Credibility Benevolence	Single-dimensional	Ganesan, 1994
Ha et al., 2011	Affective Competence	Multi-dimensional	Doney& Cannon, 1997
Corsten et al., 2011	Honesty Benevolence	Single-dimensional	Kumar et al, 1995
Chen, Huang, & Sternquist, 2011	Benevolence Credibility	Multi-dimensional	Ganesan, 1994

Source: Author analysis

Benevolence looks out for the trustor interests (Jap & Anderson, 2003), focuses on the motives and intentions of the exchange partner (Ganesan, 1994), and is based on a positive orientation of the trustee toward the trustor (Dyer & Chu, 2000). Benevolence is commonly defined as "the extent to which one partner is genuinely interested in the other partner's welfare and motivated to seek joint gain"(Andersen & Kumar, 2006; Doney & Cannon, 1997; Lai et al., 2012; Tian et al., 2008). Similarly, according to Ganesan (1994), benevolence is "based on the extent to which the retailer believes that the vendor has intentions and motives beneficial to the retailer when new conditions arise, conditions for which a commitment was not made". Benevolence has also been defined in a similar vein as dependability and goodwill (Seppänen et al., 2007), and will be the first dimension of trust in this research.

Considering that there is an expectation that interorganizational trust should have a positive relationship with performance, and that trust can be operationalized as multi-dimensional construct, the previous research hypothesis (H1) will be expanded as follows:

H1A: Benevolence is positively related to logistics performance

Credibility, reliability, integrity and honesty have been used in ambiguous forms, sometimes referred as different terminologies for the same dimension and sometimes as different

dimensions with similar terminologies. Therefore, in this research it is necessary to clearly define their meaning and position how these dimensions of trust will be used.

Credibility has been defined as an expectancy that the partner's word or written statement can be relied (Doney& Cannon, 1997; Ganesan, 1994), or the belief that a trustee makes good faith agreements, tells the truth and fulfills promises (Komiak & Benbasat, 2004). A similar definition was proposed for integrity (Lai et al., 2012;Tian et al., 2008) and honesty (Kumar et al., 1995; Thomas & Skinner, 2010), but at the same time integrity has also been defined as consistently adhering to a set of principles that the trustor finds acceptable (Levin & Cross, 2004). Considering the above discussion, in this research credibility will be the second dimension of trust, will be positioned in relation to moral standards of reliance and good faith, and will follow Doney& Cannon (1997) and Ganesan (1994) definition.

Based on that, H1 will also be expanded and the following hypothesis will be proposed:
H1B: Credibility is positively related to logistics performance

The discussion also shows that integrity and honesty sometimes share definitions that seem to be similar, either related in terms of committing to word or statements (Doney & Cannon, 1997; Ganesan, 1994; Kumar et al., 1995; Thomas & Skinner, 2010), or by the belief that the trustee tells the truth (Komiak & Benbasat, 2004). The definition for honesty can also be related to motivation to lie and openness of management (Svensson, 2001). For example, in information technology honesty is referred in terms of presenting the real facts about the outsourced work and reacting proactively if something is wrong (Oza, Hall, Rainer, & Grey, 2006), and in logistics sharing information serves as a signal of honesty (Tian et al., 2008). Based on that, in this research honesty will be the third dimension of trust, positioned as the openness of management and truth of information, and will follow Oza et al. (2006); Svensson (2001); Tian et al. (2008).

Based on that, H1 will also be expanded and the following hypothesis will be proposed:
H1C: Honesty is positively related to logistics performance

Credibility can also be referred as competence. For example, Komiak & Benbasat (2004) defines credibility as the belief that a trading partner is expert and reliable, has the needed

skills, technical capabilities and know how. Ganesan (1994) defines credibility as "the extent to which a firm in a relationship believes that the other party has the required expertise to perform the expected task effectively and reliably". However, the belief that one's partner or actors are able to fulfill the promised role obligations has sometimes been referred as reliability (Andersen & Kumar, 2006), or capability, reliability or confidence (Cho, 2006). Based on that, the fourth dimension of trust will be competence and will follow Ganesan (1994) definition that the other party has the required expertise.

Based on that, H1 will also be expanded and the following hypothesis will be proposed:
H1D: Competence is positively related to logistics performance

In summary, this research will operationalize trust as a multi-dimensional construct with four dimensions, namely benevolence, credibility, competence and honesty, and the relationship between each dimension of trust and performance will be tested.

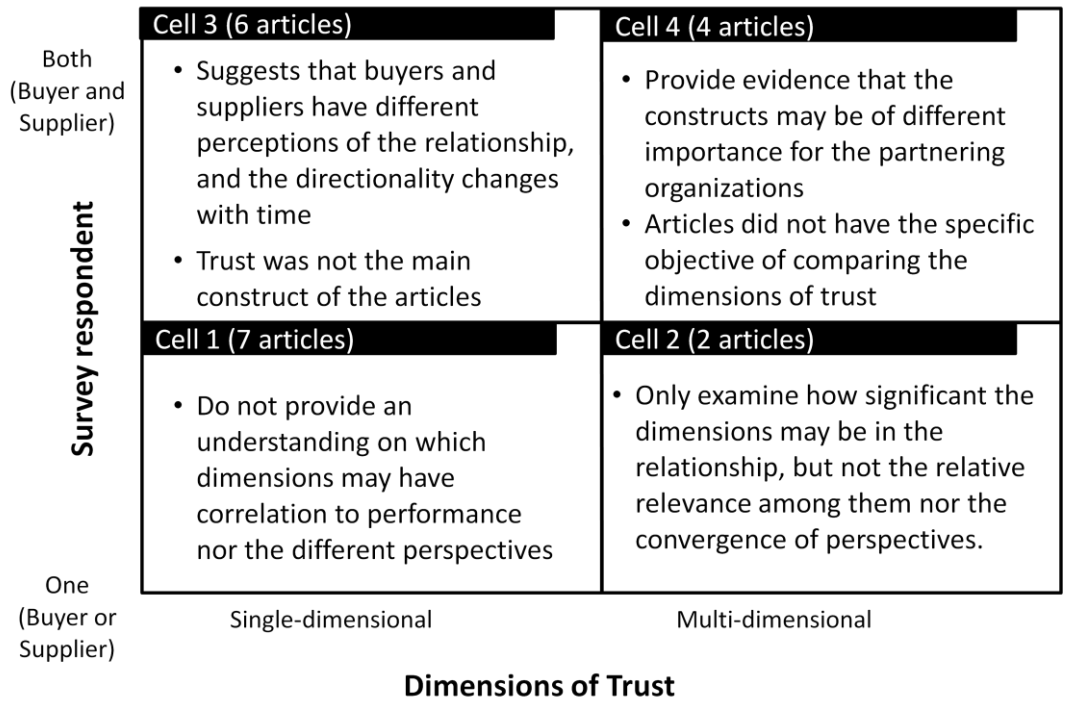
2.6 Comparing buyers´ and suppliers´ perceptions on trust

Evaluating buyers and suppliers perceptions of trust can highlight inefficiency problem areas and lead to solutions that improve not only the relationship, but also its overall performance (Whipple & Frankel, 2000).

In order to examine the similarities and differences on how the dimensions of interorganizational trust are perceived by buyers and suppliers and the impact of these different perceptions on performance, empirical studies that analyze the relationship between trust and performance were further reviewed.

From the original list of 87 articles, 19 fulfilled this criteria and were reclassified and summarized around two additional criteria, leading to a 2 x 2 matrix with four cells (Figure 3): if the research was based on one or both perspectives (buyer and supplier), and if trust was measured as a single or multi-dimensional construct. The reason for proposing such classification was that research that intends to examine different perceptions on the dimension of trust in a relationship should consider both perspectives and measure trust as a multi-dimensional construct.

Figure 3: Findings according to survey perspective and dimension of trust



Source: author analysis

Although this classification brought evidence that buyers and suppliers may have different perceptions with respect to the dimensions of trust, further investigation is required. on one side, some scholars suggest that factors that affect trust may be of different importance for buyers and suppliers (Ambrose et al., 2010; Johnston et al., 2004; Whipple & Frankel, 2000), that buyers and suppliers have perspectives that are generally more similar than they are different (Nyaga, Whipple, & Lynch ,2010), or that perceptual gaps are small in the social dimensions (Barnes et al., 2007).

However, the limitations of these articles is that trust was not the focus of their research, but one of several constructs of their study (i.e. information sharing, commitment, power, communication) or research items (i.e. legitimacy, social relations, shared values). In addition, they did not investigate which dimensions are more significant for buyers and suppliers, nor examine the relationship between the dimensions of trust and performance.

The list of articles reviewed to provide these conclusions is summarized in Table 8, and the remaining of this section expands the analysis of such articles in each cell of the 2 x 2 matrix. (one perspective/single dimensional, one perspective/multi-dimensional, both perspectives/ single dimensional and both perspectives/multi-dimensional).

Table 8: Articles according to the dimensions of trust, survey perspectives and performance

Cell	Author	Perspective	Dimensions of Trust	How performance was measured
Cell 1: One perspective Single dimensional	Donney and Cannon, 1997	Buyer	Credibility Benevolence	Not measured
	Mellewigt, Madhok, & Weibel, 2007	Buyer	Benevolence Credibility	Not measured
	Lado, Dant, &Tekleab, 2008	Buyer	Benevolence Credibility	Firm
	Tian et al., 2008	Buyer	Ability Integrity Benevolence	Not measured
	Gulati & Nickerson, 2008	Buyer	Fairness Reliability Interorganizational	Economic
	Poppo et al., 2008	Buyer	Reliability Predictability Fairness	Time and quality
	Corsten et al., 2011	Supplier	Honesty Benevolence	Cost
Cell 2: One perspective Multi-dimensional	Ha et al., 2011	Supplier	Affective Competence	Logistics
	Chen, Huang, &Sternquist, 2011	Buyer	Benevolence Credibility	Role performance
Cell 3: Both perspectives Single dimensional	Zaheer et al., 1998	Matched dyads	Fairness Reliability Interorganizational	Operational
	Kwon & Suh, 2004	Mixed sample	Honesty Benevolence	Supply Chain
	Barnes, Naudé, & Michell, 2007	Matched dyads	N/A	Not measured
	Liu, Luo, & Liu, 2009	Matched dyads	Honesty Benevolence	Economic
	Ambrose et al., 2010	Matched dyads	Credibility Benevolence	Logistics
	Nyaga, Whipple, & Lynch, 2010	Independent samples	Benevolence	Logistics
Cell 4: Both perspectives Multi-dimensional	Ganesan, 1994	Matched dyads	Credibility Benevolence	Not measured
	Svensson, 2001	Independent samples	Reliability Honesty Competence Orientation Friendliness	Not measured
	Johnston et al, 2004	Matched dyads	Benevolence Dependability	Firm
	Whipple & Frankel, 2000	Matched dyads	Character-based Competence-based	N/A

Source: Author analysis

Cell 1: One perspective, trust measured as a single dimensional construct

The seven reviewed articles that consider only one perspective (buyer or supplier) and model trust as a single-dimensional construct do not provide an understanding on which dimensions may have significant correlation to performance nor the different perspectives. Approximately 50% of the studies are based on this methodology (Corsten et al., 2011; Doney & Cannon, 1997; Gulati & Nickerson, 2008; Lado et al., 2008; Mellewigt et al., 2007; Poppo et al., 2008; Tian et al., 2008).

Cell 2: one perspective, trust measured as a multi dimensional construct

Articles that consider only one perspective (buyer or supplier) and model trust as a multi-dimensional construct allow to only examine how significant the dimensions may be in a relationship, but not the relative relevance among them or the convergence of perspectives. Two examples found in the literature review show that the dimensions of trust may have different significance effect on performance, but they are not based on the same dimensions nor in the dimensions selected for this study. A study to explore the different effects of guanxi practice during a relationship lifecycle (Z. Chen et al., 2011) found that credibility lead to commitment while benevolence not, and that commitment lead to performance. A second research measured trust that managers of supplier firms perceive toward buyer firms and its effect on collaboration and efficiency (Ha et al., 2011) found that affective trust and trust in competency influence logistics performance in different manners, but affective trust was a construct that combined dimensions related to honesty and benevolence.

Cell 3: Both perspectives, trust measured as a single dimensional construct

From the six articles that examine both perspectives and model trust as a single-dimensional construct, two suggested that buyer and suppliers have different perceptions of the relationship and one suggests that buyers and sellers have common views of the relationship, but trust was not the main construct in any of these. Nyaga et al. (2010) compared buyers´ and suppliers' perceptions to determine factors that lead to trust and performance and found that their importance vary across buyer and supplier firms, but the focus was on the dimensions of collaboration and trust was a moderating construct. Ambrose et al. (2010) found that buyers and suppliers have significantly different perceptions of their relationships across nine dimensions of relationship success, but trust was only one out of these dimensions. On the other hand, Barnes et al. (2007) found that although the perceptual gaps in the social dimensions tend to be small, its directionality changes with the relationship length: in the

short-term sellers have stronger perceptions, in the medium-term the directionality is similar, and for the long-term relations buyers have stronger perceptions. The other three reviewed articles explained the different effects of social and transactional variables on commitment and performance. Liu, Luo, & Liu (2009) found that social exchange mechanisms such as trust and relational norms are effective means for inhibiting opportunism and increasing relational performance; Zaheer et al. (1998) explained how trust operates and is inter-related at both individual and organizational levels; Kwon & Suh (2004) study how transaction cost and social exchange variables affect the level of trust and commitment in supply chain management, but considered both buyers and suppliers data in the same statistical analysis.

Cell 4: Both perspectives, trust measured as a multi-dimensional construct

Four articles examined both perspectives and modeled trust as a multi-dimensional construct, but they did not have the specific objective of comparing the relative significance between the dimensions of trust and performance. Whipple & Frankel (2000) analyzed 18 different factors that contribute to alliance success and found that character and competence based trust are among the top three for both buyers and suppliers, but the dimensions of trust were not identified and they only compared the percentage of respondents who strongly agreed with each question. In their survey, five sources of character-based trust were measured with nine questions and four sources of competence-based trust where measured with nine questions, but it it was not possible to identify which question builds each source. Two other studies provide evidence that the constructs may be of different importance for the partnering organizations, but they did not have the specific objective of comparing the relative significance of different dimensions of trust with performance. Svensson (2001) built a model with five dimensions to measure trust and found that perceived trust towards suppliers and customers differ from each other, but his survey was based on one major automaker and its suppliers to measure the perception upstream and downstream in the same company; (Johnston et al., 2004) tested a path model linking the supplier's level of trust to cooperative behaviors and these behaviors to the buyer's perception of the relationship's performance and, among their conclusions was to consider the possibility that some behaviors they measured may be of differing importance under different buyer–supplier circumstances. The fourth article (Ganesan, 1994) investigated the role that trust and dependence play in determining the long-term orientation of both retail buyers and their vendors, and not the different perceptions between the exchange partners.

In summary, research that modeled trust as a multi-dimensional construct (Cell 2 and Cell 4) suggest that the dimensions may be of different importance to performance, but did not investigate the individual dimensions of trust.

Based on that, the hypothesis entertained in the previous sections will be further expanded to consider buyer and supplier perspectives and model trust as a multi-dimensional construct in the same model as follows:

H1A: Supplier´s benevolence is positively related to logistics performance
H1B: Supplier´s credibility is positively related to logistics performance
H1C: Supplier´s honesty is positively related to logistics performance
H1D: Supplier´s competence is positively related to logistics performance

H2A: Buyer´s benevolence is positively related to logistics performance
H2B: Buyer´s credibility is positively related to logistics performance
H2C: Buyer´s honesty is positively related to logistics performance
H2D: Buyer´s competence is positively related to logistics performance

In addition, research that considered both perspectives (Cell 1 and Cell 4) provide evidence that buyers and suppliers have different perceptions of the relationship, but trust was not the main construct. Therefore, the following hypothesis will be proposed to compare the different perceptions of buyers and suppliers in relation to the dimensions of trust:

H3. Buyers and suppliers have different perceptions of benevolence, credibility, honesty and competence.

2.7 Summary of the literature review and research model proposed

It is expected that higher levels of interorganizational trust has a positive effect on performance (E. Anderson & Weitz, 1989; J. C. Anderson & Narus, 1990; Blau, 1965; Emerson, 1976; Heide & John, 1988; Morgan& Hunt, 1994; Rindfleisch & Heide, 1997; Williamson, 1981; Zaheer et al., 1998; Zaheer & Venkatraman, 1995), and that benevolence, credibility, competence and honesty are the four dimensions of trust that were defined and

will be considered in this study (Delbufalo, 2012; Seppänen et al., 2007). Performance is also a multi dimensional construct (Chow et al., 1994), and in this study it will be measured in terms of logistics performance given by delivery, cost, quality and accuracy.

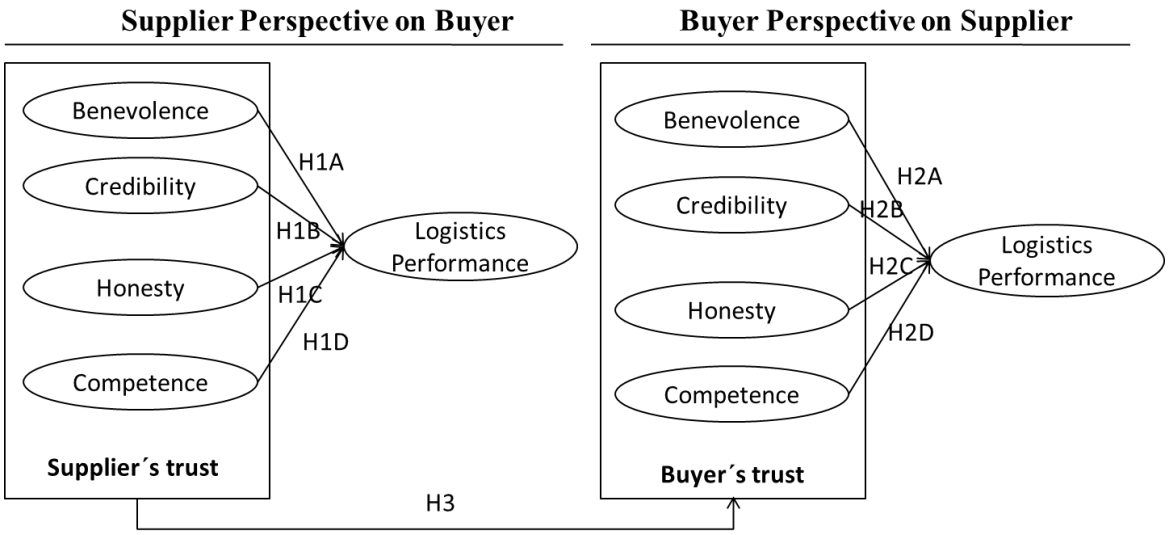
As a result, two sets of hypothesis were drawn: the first set (H1A to H1D) tests the relationship between the four dimensions of trust (benevolence, credibility, competence and honesty) and performance on the suppliers´ point of view, and the second set of hypothesis (H2A to H2D) mirrors the first one to test the relationship between the dimensions of trust and performance on the buyers´ point of view:

The literature review also revealed that there is evidence that buyers and suppliers may have different perceptions with respect to the dimensions of trust (Ambrose et al., 2010; Johnston et al., 2004; Nyaga et al., 2010; Svensson, 2001), but existing research do not investigate which dimensions are more significant for buyers and suppliers to deliver logistics performance. As a result, another hypothesis (H3) was proposed to test if buyers and suppliers have different perceptions on the dimensions of trust.

The research model that logically assembles the reasoning for building each relationship for internal consistency and give empirical verification for the hypothesis is presented in

.

Figure 4: Research model and hypothesis



3 Methodology

Empirical research in operations management (POM) requires the adoption of solid and systematic research planning and execution procedures to ensure that the investigation is carried out in a sufficiently rigorous manner (Arkader, 2002; Black, 1999; Forza & Cipriano, 2002). These procedures include the selection of appropriate research design and data collection methods, proper implementation and the use of correct data analysis techniques for interpreting the results (Forza & Cipriano, 2002; Malhotra & Grover, 1998).

Attentive to these issues, this section details the methodology and is organized in three topics: (3.1) the research strategy, measurement instruments and scope, (3.2) sample and data collection procedures, and (3.3) data analysis procedures used.

3.1 Research strategy

Theories can be tested using a variety of methods, and the paradigmatic stance has a strong influence on the shape and form of the research (Burgess et al., 2006). This study fits the positivist paradigm because its objective is to empirically determine a causal relationship between trust and logistics performance.

An explanatory survey is the appropriate method for this research because there are well defined models and propositions related to interorganizational trust. Also, the dimensions and scales to measure trust are well developed and do not need to be created, but tested to extend the existing theory (Ambrose et al., 2010; Doney & Cannon, 1997; Ha et al., 2011; Nyaga et al., 2010).

The unit of analysis refers to the level of data aggregation during subsequent analysis, and in operations management can be individuals, dyads, groups, plants, divisions, companies, etc. (Forza & Cipriano, 2002). It is important to determine the unit of analysis because data collection methods, sample size and the operationalization of constructs may be guided by the level at which data will be aggregated at the time of analysis (Forza & Cipriano, 2002). In this study, the buyer and the supplier will be the unit of analysis.

3.2 Scope and delimitation

The Logistics Service Industry was selected for this research due to three main reasons: the lack of studies on interorganizational trust in services, the relevance of trust in logistics and expertise of the researcher in this area. Previous systematic literature reviews on trust and supply chain management (Blomqvist, 1997; Burgess et al., 2006; Delbufalo, 2012; Seppänen et al., 2007) show that studies in this field appear to be concentrated in few manufacturing industry sectors that mainly handle physical goods such as consumer goods retailing, computer assembling and automobile, and this has been confirmed in the literature review. For example, Nyaga et al. (2010) had 95% of their sample in industrial or retail industry and only 5% in transportation, Ross et al. (1997) examined insurance firms and their agents, Hingley (2005) investigated the nature and management of power in the UK fresh food channel, (Lee & Johnsen, 2012) investigated both the smaller supplier and larger customer in the Taiwanese electro-electronic business, Donada & Nogatchewsky (2006) worked on lord and vassal relationships in the agri, pharma and air industries, Gulati &Sytch (2007) in the auto industry and Ambrose et al. (2010) surveyed information and communication technology equipment manufacturers.

Second, Logistics is essentially a "service" where trust has already been considered a critical aspect (Ambrose et al., 2010; Autry & Golicic, 2010; Ha et al., 2011), it is a strategic market because firms are currently increasing outsourcing of their logistics activities to achieve competitive advantage (Ha et al., 2011; Lai et al., 2012; Nyaga et al., 2010), and trust between supply chain partners has been underestimated in supply chain research (J. C. Anderson & Narus, 1990; Ha et al., 2011; Svensson, 2001).

Finally, Gulati (2007) suggests that the starting point for all research must be subjecting hunches to managerial insight, probe more deeply into the problems and other issues and naturally align academic and practice interests without sacrificing rigor. In this case, the researcher has more than 15 years of strategic, managerial and operational experience in supply chain and in logistics, and has worked in several industries in Brazil and Switzerland, such as telecom, automakers, health and beauty, food and beverages.

3.3 Sample and data collection procedures

Because the objective of this research was to understand the relationship between interorganizational trust and logistics performance from buyers´ and suppliers´ perspectives, two independent samples were required. One sample targeted supplier firms and the second targeted buyer firms.

In order to ensure that both the samples and the conditions under which the study is carried out are representative of the population and situations to which the results apply (Black, 1999), four potential sources of external invalidity were addressed: (i) send the survey to companies from the logistics sector that do not provide logistics services, (ii) provide clear instruction on how the respondent should select the relationship partner (iii) obtain a sizable sample. This section details these issues and the measures taken to mitigate them,.

3.3.1 Supplier sample: defining Logistics Service Providers

Several denominations can be used to define the type of a LSP (Figueiredo & Mora, 2009), including third-party logistics providers (in Portuguese, Provedor de Serviços Logísticos, PSL or 3PL), integrated logistics providers (Provedores de Logística Integrada), contract logistics companies (Empresas de Logística Contratada) and logistics operators (Operador Logístico), the latter being the most used denomination in the Brazilian context (Figueiredo & Mora, 2009).

Based on Figueiredo & Mora (2009), the type of logistics operators are defined according to three denominations and will be used in the survey instrument: 1- Storage and inventory (Serviços de Armazenagem e Controle de Estoque), which include physical storage and inventory management; 2- Transportation (Transporte), which includes inbound transportation, distribution, reverse logistics and vehicle tracking, and 3- Value added services (Serviços de Valor Agregado) which include kitting, packing and special projects. Participants were asked to inform the type of logistics services the relationship refers to, and questionnaires that did not match one of the three types above were excluded.

3.3.2 Criteria for choosing the relationship partner to be surveyed

For all questions, respondents were instructed to "Complete the survey with respect to the relationship between your firm and the selected supplier/buyer firm.". Therefore, selecting the relationship partner that the respondent (either the buyer or the supplier) would refer to was important to avoid external bias.

Based on previous literature, three different criteria were found for this selection (Table 9). According to Anderson & Narus (1990), relationships with firms that supply the first or second highest selling product lines tend to be uniformly positive, whereas relationships with the fourth manufacturer firms more variable. This may be the case why a research that considered only key relationships in the sample concluded that benevolence is not found to have impact on performance (Ambrose et al., 2010), or that trust does not have a statistically different paths to performance (Nyaga et al., 2010), or that there are no significant differences between the two sides (Liu et al., 2009). Therefore, to facilitate obtaining variation in the relationships studied and establish a relationship between the dimensions of trust and performance, buyers and suppliers were asked to choose as their relationship partner a firm that supply at least the fourth-highest volume of service in one of the three types of services described earlier.

Table 9: Criteria to select the relationship partner to be surveyed

Criteria	References
Consider a relationship that represents the fourth largest expenditure	Anderson & Narus, 1990; Zaheer, Mcevily, & Perrone, 1998
Select key/top tier relationships	Ambrose et al., 2010; Corsten, Gruen, & Peyinghaus, 2011; Liu, Luo, & Liu, 2009; Nyaga et al., 2010
Identify the most cooperative relationship	Johnston, McCutcheon, Stuart, & Kerwood, 2004

Source: Author analysis

3.3.3 Buyer and supplier samples

In order to ensure a wide range of type of companies and a large volume of respondents, databases from two trade associations mailing lists were used for both buyer and supplier samples. Abralog (Associação Brasileira de Logística / Brazilian Logistics Association) is a major association of logistics and supply chain professionals in Brazil, and Publicare is the

publisher of Tecnologística, a leading Brazilian magazine focused in logistics and supply chain. They both have buyers and supplier members in their databases.

The survey with the invitation letter was sent to 5.759 potential respondents, from which 2.800 were in Abralog´s mailing list and 2.959 from Publicare, and 1.162 messages bounced back (20%), leading to 4.597 valid email addresses.

Based on previous research, a number of measures were taken to increase the response rate (Forza & Cipriano, 2002; Malhotra & Grover, 1998; Yu & Cooper, 1983). First, an electronic message containing an invitation letter and the link to the Internet site address which hosts the survey were sent (Appendix 2). The electronic messages were sent from these trade associations to the email addresses of potential respondents, and stressed the importance of participation and assured anonymity. Follow-up initiatives were applied, including a second email reminder sent approximately 15 days after the initial email, which generated a second wave of respondents. An invitation to attend a workshop where a summary of the results will be presented at FGV-EASP was also offered as a non-monetary incentive to participate. Finally, whenever possible, phone calls were made to the researcher´s social network to ensure that they have received the questionnaire and would respond to it.

The total survey yielded to 173 responses (3,8%), from which 83 were buyers´ (48%) and 90 were suppliers (52%). From the 83 buyer responses in the buyer version, 10 were excluded because of missing data on all quantitative questions (7 questionnaires) or because they answered the supplier version instead of the buyer´s (3 questionnaires). Only one questionnaire was removed from the supplier version because the respondent was an academic professor instead of a logistics professional and 14 had missing values, yielding 77 valid questionnaires.

As a result, the final sample consisted of 148 valid responses, from which 73 (50%) have the buyer perspective and 75 (50%) the supplier perspective.

3.4 Measurement instruments

Measurements and scales for the constructs proposed in the research model were adopted from previous research and are detailed in this section, including the control variables.

Benevolence

The questions used to measure benevolence can be found in three commonly cited articles (Doney & Cannon, 1997; Ganesan, 1994; Kumar et al., 1995), and are very similar in meaning and context. Because adapting the questions from any of them would fulfill the requirements for this study, benevolence was adopted from Doney & Cannon (1997). Questionnaires were originally obtained in English and the translated version in Portuguese obtained from a previously tested scale from Frederico & Parente (2008).

Credibility:

Similar definitions for credibility can be found in Donney & Cannon (1997) and Ganesan (1994). The questions used to measure credibility was based on Donney and Cannon (1997) because they can be directly adopted to this study according to the proposed definition and a translated version is already tested in Portuguese (Frederico & Parente 2008). Ganesan (1994) was not used because one of its question asks if the partner is "knowledgeable regarding his/her products", which in this study refers to competence and could create ambiguity when answering the questionnaire.

Honesty

Honesty was adopted from Svensson (2001). Although Kumar et al. (1995) share a similar definition and are commonly cited as a measurement reference, one of the questions has the word "keeps the promises", which was already used to measure credibility and could create ambiguity when answering the questionnaire. Questionnaires were originally obtained in English and required to be translated. In order to avoid cultural bias and ensure translation equivalence, one person translated the questionnaire into Portuguese and then the Portuguese version was back-translated into English by a different person (Mullen, 1995).

Competence

Although competence could be adopted from Cho (2006) or Ha et al. (2011), this research adopted the questions from Cho (2006) because it is more commonly cited (186 citations vs. 69, as of May/2015). Questionnaires were originally obtained in English, and translation procedures followed the same for honesty.

Logistics performance

Among the reviewed articles, Ambrose et al. (2010) is the one that used the same four dimensions (delivery, cost, quality and accuracy) proposed for this study (Table 10), but the specific words "order accuracy" and "order condition" used in the questionnaire did not have a common straightforward translation to Portuguese. The original source used by Ambrose et al. (2010) was Dalstrom, McNeilly, & Speh, (1996), which has a more detailed wording that could be translated into Portuguese more easily and was adopted for this study. Questionnaires were originally obtained in English, and translation procedures followed the same for honesty.

Table 10: Logistics performance dimensions used in reviewed articles

	Logistics Performance			
Author	**Delivery**	**Cost**	**Quality**	**Accuracy**
Ambrose, 2010	X	X	X	X
B Há, 2011	X	X		
Chen, Haozhe 2010	X	X		
Conceição, Samuel Vieira, 2004	X		X	X
Gassenheimer, Sterling, & Robicheaux, 1996	X		X	X
Nyaga, 2010	X		X	X
Daugherty, Ellinger, & Gustin, 1996		X	X	

Source: author analysis

Table 11 summarizes the measurements for constructs, labels and definitions for each question of the survey for the buyer version in English. The supplier version has the same questions as the buyer version, and the final version in Portuguese for both questionnaires is detailed in Appendix 3.

The possible answers for the questions are usually based on a 5 or 7 point Likert scale, and there have been numerous studies on the topic of how scale format affects scale reliability and validity (Dawes, 2008). The experiment conducted to assess the impact of scale categories on responses compared data obtained from using 5-point, 7-point and 10-point scales conducted by Dawes (2008) concluded that no scale format produced data with markedly lower variances about the mean, suggesting that none format is less desirable in obtaining data for regression analysis. Based on that, this study used a 5 point scale to be consistent with the reviewed articles that were developed and published in Brazil (Conceição & Quintão, 2004; Figueiredo & Mora, 2009; Miguel & Brito, 2010). The sequence of agreement ranged from 1

- Totally Disagree (Discordo totalmente) to 5 - Totally Agree (Concordo totalmente). The questions in the survey were randomly arranged to minimize any response bias.

Table 11: Measurements for the research model - Buyer version in English

Construct	Code	Question	Adopted from
Credibility	CRE1	We find it necessary to be cautious with this supplier (reverse coded)	Doney & Cannon, 1997
	CRE2	This supplier is not always honest with us (reverse coded)	
	CRE3	We believe in the information that this supplier provides us	
	CRE4	This supplier keeps promises it makes to our firm	
	CRE5	This supplier is trustworthy	
Benevolence	BEN1	We trust this supplier keeps our best interests in mind	Doney & Cannon, 1997
	BEN2	This supplier is genuinely concerned that our business succeeds	
	BEN3	When making important decisions, this supplier considers our welfare as well as its own	
Honesty		This supplier [...]	Svensson, 2001
	HON1	[...]always try to inform us if problems occur	
	HON2	[...]always provide the information we require	
	HON3	[...]never try to hide something serious that may influence us negatively	
Competence		The way they operate their business made me feel that this supplier[...]	Cho, 2006
	COM1	[...]are experts in this business	
	COM2	[...]know what they are doing	
	COM3	[...]is competent	
	COM4	[...]is proficient	
Performance		This supplier meets our [...]	Dalstrom et al., 1996
		Supplier version: We meet our [.. .]	
	PER1	[...] order processing accuracy expectations	
	PER2	[...] percentage of order damaged expectations	
	PER3	[...] agreed costs	
	PER4	[...] on-time delivery standards	

Source: Author analysis

Other variables outside the model may influence performance in the dyadic relationship, and controlling for such variables provides a stronger test of the model (Doney & Cannon, 1997; Nyaga et al., 2010). Three control variables were included in this study: Relationship duration, size and industry sector.

Relationship duration refers to the time length of the exchange relationship, and was already pointed that over time it increases firms' trust and commitment (Blau, 1965; Cropanzano & Mitchel, 2005), or that the perceptions of trust may become congruent when the relationship has an extended length of time (Ambrose et al. 2010). Relationship duration was a control variable measured by a single item (Doney & Cannon, 1997; Lai et al., 2012; Liu et al., 2009), i.e., the number of years of the selected exchange relationship (less than 2 years, 2 to 5 years, more than 5 years).

Size has been included as a control variable in empirical research on trust (Poppo et al., 2008) because it helps to account for sources of heterogeneity at the firm level (Mellewigt et al., 2007), or assess the possibility that larger firms may sustain greater relationship strengths than smaller firms (Autry & Golicic, 2010). Therefore, in this study contract size was also included and based on the expected annual sales volume with the selected partner for the current year, in local currency (BRL).

Finally, respondents were asked to indicate which industry sector they belong. In the buyers´ questionnaire they were asked which service type the partner provides and industry sector the company belongs. In the supplier questionnaire, it was asked which type of service the company provides and the industry sector the selected partner operates.

In order to facilitate the visualization of the final questionnaire format, a copy of the final questionnaire for the supplier version (in Portuguese) is presented in Appendix 4.

3.5 Questionnaire pre-testing

Pre-testing a questionnaire was done by submitting the "final" questionnaire to industry expert colleagues and target respondents, and previous research recommended to proceed in two phases (Forza & Cipriano, 2002): First, the researcher filled in the questionnaire when visiting three potential respondents to find out if the instructions were clear, the questions were clear, the time to complete the survey was adequate, or anticipate any unexpected problem. Two relevant remarks were made during this visits in regard to the partner selection: First, the instructions to select the relationship partner were not clear enough for some respondents, and they were re-written with them until the text was accepted. Also, they raised a concern that

some buyers may operate with fewer than four LSPs, and that might conflict with the instructions or lead to a bias. As a result, an additional control variable was added for further analysis, asking the number of suppliers that the buyer had for the selected service.

Then, a pre-test sample was conducted with three professionals to gather data to perform an exploratory assessment of measurement quality and investigate whether the answers to certain questions were too concentrated due to the choice of scale or differed from what it was expected. These professionals suggested that there was no need for an invitation letter because Abralog and Tecnologística are known institutions and it would not make difference for the respondents. No relevant remarks or findings were made during that assessment.

4 Data analysis

The data analysis procedures presented in this section specify the validity techniques performed to interpret the results and guarantee statistical validity (Black, 1999), including survey data cleansing and analysis, construct validity and model validity.

Data analysis was conducted using IBM SPSS Statistics and ISM SPSS AMOS software version 22 and consisted in three steps. The first step was an initial sample analysis based on standard exploratory descriptive statistics, the second step carried out the construct validity, and the third step was the model validity to confirm (or reject) the proposed hypothesis.

4.1 Initial sample analysis

Initial sample analysis was performed by checking the frequency distribution of the demographic variables and the mean, standard deviation and range of the dependent and independent variables between buyer and supplier samples (Forza & Cipriano, 2002), and no relevant differences were found between them.

Table 12 shows the distribution of respondents' industry category in which their companies operate. The top 5 industry sectors were the same for both buyers and suppliers, and had similar representativeness, accounting for 79% (buyer) and 71% (supplier) of respondents

respectively. Respondents in "other" sectors totaled 17 respondents that worked for 13 different industries and sectors, such as textiles, education and games.

Table 12: Respondent´s industry category

	Frequency		Percentage	
Industry	**Buyer**	**Supplier**	**Buyer**	**Supplier**
Consumer goods: food, beverage, health and beauty	23	17	32%	23%
Automotive and auto-parts	9	11	12%	15%
Distribution: retailers, wholeselers, importers, traders	11	10	15%	13%
Chemical and pharmaceutical	11	8	15%	11%
Electro-electronics	4	12	5%	16%
Metal and mechanic parts	0	6	0%	8%
Metal, mining, pulp and paper	0	4	0%	5%
Agribusiness, fertilizer and milk	2	2	3%	3%
Other industries	12	5	16%	7%
Missing	1	0	1%	0%
Total	73	75	100%	100%

Source: Author analysis

Other characteristics such as relationship time and contract annual value were also analyzed (Table 13) and showed similar representativeness, and therefore were not a concern for the research.

Table 13: Relationship time and contract annual value

Relationship time	**Buyer**	**Supplier**	**Contract annual value**	**Buyer**	**Supplier**
Less than 2 years	13%	17%	Less than R$ 1 milion	36%	16%
2 to 5 years	38%	25%	From R$ 1 to 3 million	30%	29%
5 to 10 years	23%	24%	From R$ 3 a 10 million	21%	16%
More than 10 years	25%	33%	From R$ 10 to 20 million	5%	8%
Missing	1%	0%	Missing	8%	20%
Total	100%	100%	Total	100%	100%

Source: Author analysis

Non-respondents may alter the sample frame, leading to a sample that does not represent the population and limit the generalizability of results (Forza & Cipriano, 2002), but the respondent databases were proprietary to the associations and was not possible to compare respondents with non-respondents. Therefore, an alternative method that is generally accepted was to check for differences between the first and second waves of respondents (Ambrose et al., 2010; Corsten et al., 2011; Forza & Cipriano, 2002; Poppo et al., 2008; Zacharia et al., 2011).

Following the procedure suggested by Armstrong & Overton (1977), t-test and ANOVA were performed to compare the mean value between the first and second waves to ensure the samples were not statistically different for the five constructs. The results revealed that the mean values for the five constructs were not significantly different ($p < 0.05$) between wave one and two (Table 14), and therefore responses across the first and second waves were not a concern for the research.

Table 14: T-test and ANOVA test for wave 1 and 2

			T-test Difference Between Means		**ANOVA Equality of Variances**	
	Mean Values		**Wave 1 and Wave 2**		**Buyer and Supplier**	
Construct/ Questions	**Wave 1**	**Wave 2**	**T-value**	**p-value**	**F-test**	**Lavene test**
Benevolence (BEN 1 - BEN 3)	3,754	3,465	1,67	0,096	0,486	0,579
Performance (PER 1 - PER 4)	4,389	4,500	-0,95	0,342	0,736	0,188
Competence (COM 1 - COM 4)	4,117	4,083	0,20	0,841	0,123	0,145
Honesty (HON 1 - HON 3)	3,826	3,747	0,51	0,611	0,932	0,699
Credibility (CRE 1 - CRE 5)	4,064	3,990	0,49	0,627	0,662	0,812

Source: author analysis

Univariate normality is a fundamental assumption of estimation methods in SEM (which include Exploratory and Confirmatory Factor Analysis (EFA and CFE), and was obtained through descriptive statistics of the sample distributions, including the mean, standard deviation, skew indices and kurtosis indexes for each variable (Kline 2005). Asymmetries above 3 and kurtosis above 10 mean that data is extremely non-normal and alternative solutions based on non-parametric tests should be considered (Kline 2005; HAIR et al., 2005, p.287).

Descriptive analysis in this study (Table 15) did not show relevant deviations from the expected values: skew indexes varied from −1,73 to +0,43 and kurtosis indexes from -1,34 to 4,36. Therefore, parametric tests could be used for conducting the construct and model analysis. All symmetries except for CRE1 had a negative sign, indicating that the sample is skewed above the mean (to the right) or, in other words, that respondents tend to have a more positive view of trust.

Finally, the concern raised in the questionnaire pre-testing regarding the possibility that buyers operate with fewer than four LSPs (which lead to the additional control variable of the

number of suppliers) was not a problem because 84% of buyers operate with 4 or more suppliers.

Table 15: Sample descriptive statistics

Item	Minimum	Maximum	Average	Std Deviation	Skew	Kurtosis
CRE1	1	5	2,50	1,243	,464	-,839
CRE2	1	5	3,41	1,442	-,326	-1,348
CRE3	2	5	4,07	,881	-,932	,399
CRE4	2	5	3,91	,832	-1,053	,942
CRE5	1	5	4,16	,967	-1,096	,491
BEN1	1	5	3,58	1,003	-,594	-,213
BEN2	1	5	3,64	1,107	-,625	-,387
BEN3	1	5	3,84	,938	-,886	,230
HON1	2	5	4,14	,888	-,991	,420
HON2	1	5	3,85	1,065	-,726	-,417
HON3	1	5	3,43	1,114	-,262	-,874
COM1	1	5	4,18	,967	-1,184	,906
COM2	1	5	4,03	1,043	-,966	-,065
COM3	1	5	4,08	,944	-,852	,082
COM4	1	5	4,16	,931	-1,136	,815
PER1	1	5	4,38	,768	-1,680	4,369
PER2	2	5	4,42	,690	-1,151	1,487
PER3	1	5	4,47	,742	-1,731	3,954
PER4	1	5	4,39	,705	-1,415	3,636

Source: author analysis

4.1.1 Control variables

Relationship time and contract value were two control variables tested due to their possible relationship with trust: firms' trust might increase over time and firms with large contract sizes might sustain greater relationship strengths.

ANOVA tests were performed for these two control variables (Table 16) and showed that at significance level $\alpha = 0,05$ there is no evidence that trust is perceived differently depending on relationship time or contract value.

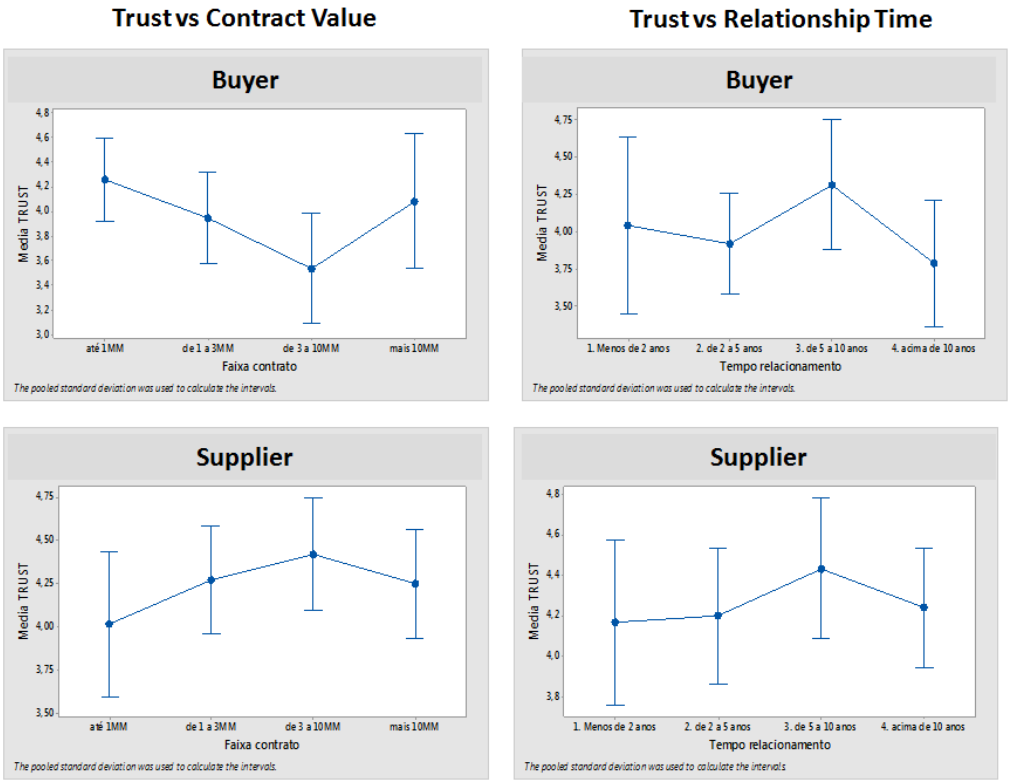
Table 16: Perception of trust according to contract value and relationship time

Contract value				Relationship time			
Parameter	N	F-Value	P-Value	Parameter	N	F-Value	P-Value
Buyer	73	2,23	0,09	Buyer	73	1,13	0,34
Supplier	75	0,76	0,52	Supplier	75	0,44	0,72

Source: author analysis

Figure 5 shows the results of the Anova test in graphical format:

Figure 5: Perception of trust according to contract value and relationship time



Source: author analysis

4.1.2 Conclusion: initial data analysis

The initial data analysis confirmed that the data obtained in the surveys are reliable: samples are of similar sizes, industries and relationship time have similar distribution %, both waves are similar and variances between buyer and supplier samples are equal.

Although a 5 point likert scale was used, the distribution of responses in each item did not show deviations of univariate normality, and therefore parametric tests can be used.

Finally, given that relationship time and contract value do not seem to impact trust, construct and model validity could be performed based on buyer and supplier models, and no mediating variables were necessary.

4.2 Construct validity

Construct validity is the extent to which the items in a scale measure the abstract or theoretical construct (I. J. Chen & Paulraj, 2004) and that they do not correlate with other constructs, and was performed in two steps following Bagozzi, Yi, & Phillips (1991) methodology.

The first step is convergent (or unidimensionality) validity, which measure the extent to which the individual items in a scale measure the abstract or theoretical in the same construct, and is frequently demonstrated by ensuring that all Cronbach's Alpha loadings are significant (Ambrose et al., 2010). The second step is discriminant (or composite) validity, which measure the extent to which the individual items of a construct are unique and do not measure any other constructs (I. J. Chen & Paulraj, 2004).

4.2.1 Convergent validity

Convergent validity was examined by means of exploratory (EFA) and confirmatory factor analysis (CFA), which were ran with a measurement model in which each item was restricted to load on its pre-specified construct (J. Anderson & Gerbing, 1988). Reference measurement values for construct validity followed widely accepted recommendations, such as items with factor loadings of 0.7 or above (Fornell & Larcker, 1981) and reliability coefficients (Cronbach-α) coefficients above 0.7 (Bagozzi et al., 1991).

Table 17 shows the loadings and Cronbach-α for all the items of the scales, including two adjustments that were made after computing the values. First, despite Honesty presented a Cronbach-α value of 0,65/0,64 (buyer/supplier), which is below 0,7, it was maintained in the model based on Boyer & Lewis (2002). When faced in a similar situation in measuring quality with a Cronbach-α of 0,65, they maintained the measurements because this dimension has been shown to possess good reliability in previous studies and could be considered acceptable.

Two measurement items for credibility (CRE1 and CRE2) showed low load factors and impacted the reliability coefficient. An examination of these items revealed that they were the only two questions measured with reverse scales, and they might have been misinterpreted or lead to a response bias, and therefore were excluded from the scale.

Table 17: Convergent validity: Factor loadings and reliability coefficients

	Cronbach-α		**Standardized regression weights**	
Factor and scale items	**Buyer**	**Supplier**	**Buyer**	**Supplier**
Performance	0,785	0,837		
PER1			0,75	0,94
PER2			0,71	0,69
PER3			0,71	0,78
PER4			0,61	0,58
Honesty [(a)]	0,651	0,644		
HON1			0,97	0,93
HON2			0,61	0,44
HON3			0,39	0,56
Benevolence	0,829	0,827		
BEN1			0,82	0,84
BEN2			0,79	0,69
BEN3			0,75	0,84
Credibility	0,851	0,851		
CRE1[(b)]			0,37	0,05
CRE2[(b)]			0,14	0,19
CRE3			0,89	0,82
CRE4			0,67	0,54
CRE5			0,87	0,87
competence	0,919	0,880		
COM1			0,91	0,88
COM2			0,74	0,74
COM3			0,84	0,75
COM4			0,97	0,88

[(a)] Maintained based on Boyer & Lewis (2002)
[(b)] Items dropped after EFA and CFA
Source: author analysis

After this exclusion, measurements were considered acceptable and the five constructs were maintained in the model.

4.2.2 Discriminant validity: proposed model

Discriminant validity was assessed using CFA models that considered all possible pair of constructs (Bagozzi et al., 1991), and two set of measurements were used to confirm the validity. The first set is the correlation matrix among the constructs and the second set

computed several fit indexes and corresponding acceptable values suggested for an acceptable fit of the model to the data based on Hair et al. (2006) and Kline (2005) and are listed in Table 18.

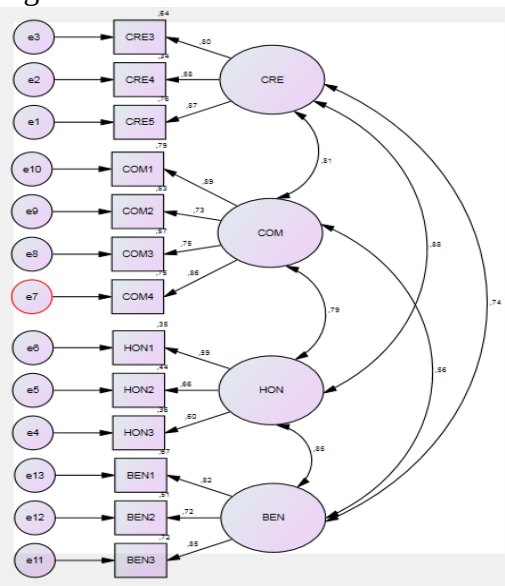
Table 18: CFA fit measurements acceptable values

Measurement	**Acceptable Values**
CMIN / DF (χ 2/DF)	< 2,0
p-value chi2	> 0,05
GFI (goodness-of-fit index)	> 0,90
RMR (Root Mean Residual)	< 0,10
RMSEA (root mean square error of approximation)	0,03 - 0,08
NFI (Normed Fit Index)	> 0,90
CFI (Comparative Fit Index)	> 0,90

Based on Hair et al. (2006); Kline (2005)
Source: Author analysis

Two identical CFA models with the four constructs were developed and run, one for the buyer samples and another for the supplier samples (Figure 6).

Figure 6: Model with the four dimensions of trust



Source: Author analysis

These two models produced similar results, with both sets of measurements showing poor discriminant validity. The correlation matrix of these measures is detailed in Table 19 and were close to unity, significantly above the recommended value of 0,7 (Gulati, 1995), and brought evidence of serious multicollinearity among the constructs.

Table 19: Construct correlations in the measurement model

	Buyer Sample				Supplier Sample			
	CRE	**HON**	**BEN**	**COM**	**CRE**	**HON**	**BEN**	**COM**
CRE	1				1			
HON	0,92*	1			0,88**	1		
BEN	1,00**	0,88*	1		0,74**	0,85**	1	
COM	0,93**	0,86*	0,92**	1	0,81**	0,79**	0,56**	1

* significant at 0,05 level, ** significant at 0,01 level
Source: Author analysis

In addition, several model fit indexes (Table 20) were outside acceptable threshold values with [CMIN / DF] 2,19; [RMSEA] 0,13; [NFI] 0,80; [CFI] 0,87, and therefore confirmed the lack of discriminant validity for both buyer and supplier samples.

This result shed some light in the debate about the multidimensionality of trust discussed earlier in section 2.5 by not supporting the stream that discusses trust as a multidimensional construct defined and measured by non dominant theoretical dimensions.

Table 20: Model fit indexes - buyer and supplier samples

Measurement	**Acceptable**	**Buyer**	**Supplier**
CMIN / DF	< 2,0	1,80	2,19
p-value $\chi 2$	> 0,05	0,00	0,00
RMSEA	0,03 - 0,08	0,11	0,13
NFI	> 0,90	0,88	0,80
CFI	> 0,90	0,94	0,87

Source: Author analysis

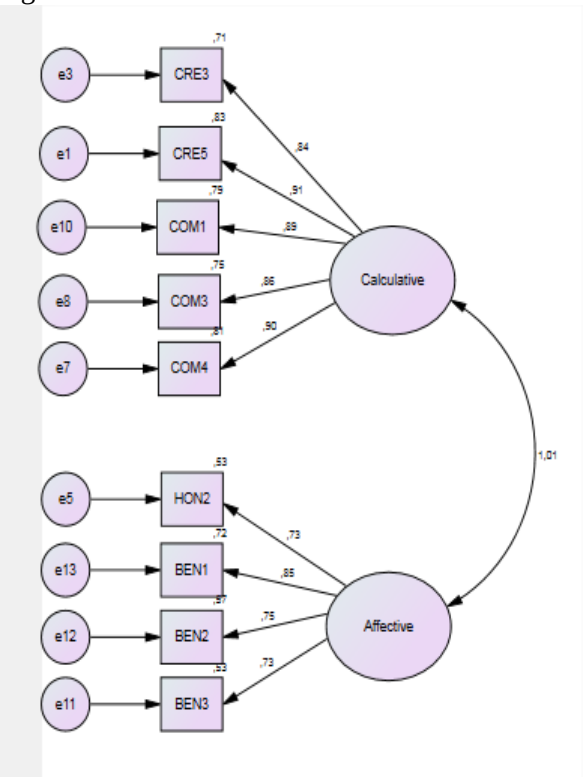
Therefore, the proposed model was adjusted to reflect the second stream of research that proposes that trust should be operationalized on two dominant dimensions, affective and calculative, and new construct validity tests were conducted to confirm the theory.

4.2.3 Model with two dominant dimensions: convergent and discriminant validity

In order to reflect a two dimensional model for trust, the constructs benevolence and honesty were collapsed into a construct named affective trust, and the constructs competence and credibility were combined into a new construct named calculative trust (Figure 7). These

constructs were initially presented by 13 items, from which 6 for affective trust and 7 for calculative trust. Two new identical all-factor correlated models (one for the buyer sample and another for the supplier sample) were specified for each construct.

Figure 7: Model with affective and calculative trust



Source: Author analysis

Dimension reduction, convergent and discriminant validity tests were conducted in an interactive process for the two models. In each interaction, one item was removed from the model and the same measurements presented in the previous section were computed: factor loadings, Cronbach-α, construct correlations and model fit indexes. This procedure was repeated until the best model fit statistics were achieved

The buyer model was run 5 times, and during modifications the variables HON3, CRE4, COM2 and HON1 were dropped in this sequence until reaching the best possible fit. The model showed a good convergent validity with all load factors in the range of 0,73 and 0,91 (Table 21) and final a Crombach-alpha of 0,85 / 0,94 (affective / calculative).

Table 21: Convergent validity- model with affective and calculative dimensions (buyer sample)

		Interaction				
Dimension	**Item**	**1st**	**2nd**	**3rd**	**4th**	**5th**
Calculative trust	COM4	0,91	0,91	0,91	0,90	0,90
	COM3	0,87	0,86	0,87	0,87	0,87
	COM2	0,73	0,73	0,72	-	-
	COM1	0,89	0,89	0,89	0,88	0,89
	CRE5	0,90	0,90	0,90	0,91	0,91
	CRE3	0,85	0,85	0,85	0,85	0,84
	CRE4	0,67	0,67	-	-	-
Affective trust	BEN3	0,74	0,74	0,74	0,74	0,73
	BEN2	0,75	0,74	0,75	0,76	0,75
	BEN1	0,85	0,85	0,85	0,85	0,85
	HON2	0,75	0,75	0,75	0,74	0,73
	HON1	0,67	0,66	0,66	0,66	-
	HON3	0,34	-	-	-	-

All loads were significant at 0,01 level
- indicate item removed in the corresponding interaction
Source: author analysis

However, the model for the buyer version showed poor discriminant validity (Table 22), indicating that respondents also did not differentiate these two dimensions. The correlation between these constructs was equal to unity, and model fit indexes were outside acceptable threshold values with [CMIN / DF] 2,33; [p-value] 0,0; ; [RMSEA] 0,09; [χ 2/DF] 2,3.

Table 22: Fit indexes- model with affective and calculative dimensions (buyer sample)

Measurement	**Acceptable**	**Observed**
Correlation Affective < - > calculative trust	< 0,7	1,00
CMIN / DF	< 2,0	2,33
p-value χ 2	> 0,05	0,00
RMSEA	0,03 - 0,08	0,09
NFI	> 0,90	0,91
CFI	> 0,90	0,94

Source: Author analysis

The supplier model was also run 5 times until reaching the best possible fit and resulted convergent validity factors very similar to the buyer model after modifications: the same variables HON3, CRE4, COM2 and HON1 were dropped, the model showed a good convergent validity with all load factors in the range of 0,71 and 0,84 (Table 23) and Crombach-alpha of 0,81 / 0,88 (affective / calculative).

Table 23: Convergent validity- model with affective and calculative dimensions (supplier sample)

		Interaction				
Dimension	**Item**	**1st**	**2nd**	**3rd**	**4th**	**5th**
Calculative trust	COM4	0,85	0,86	0,86	0,87	0,87
	COM3	0,73	0,73	0,73	0,72	-
	COM2	0,72	0,72	0,72	0,74	0,72
	COM1	0,85	0,86	0,86	0,86	0,84
	CRE5	0,78	0,78	0,77	0,76	0,79
	CRE3	0,73	0,73	0,73	0,72	0,74
	CRE4	0,54	0,53	0,53	-	-
Affective trust	BEN3	0,84	0,87	0,87	0,88	0,88
	BEN2	0,69	0,69	0,67	0,67	0,67
	BEN1	0,79	0,81	0,80	0,80	0,80
	HON2	0,64	0,63	0,65	0,65	0,65
	HON1	0,47	-	-	-	-
	HON3	0,62	0,60	-	-	-

All loads in the final model were significant at 0,01 level
- indicate item removed in the corresponding interaction
Source: author analysis

The supplier model also showed poor discriminant validity and still high correlation between the two constructs (0,64). The model for the supplier version also showed model fit indexes outside acceptable threshold values (Table 24): [CMIN / DF] 2,4; [p-value] 0,0; [RMSEA] 0,14; NFI [0,85] and [χ 2/DF] 2,4.

Table 24: Fit indexes- model with affective and calculative dimensions (supplier sample)

Measurement	**Acceptable**	**Observed**
Correlation Affective < - > calculative trust	< 0,7	0,64
CMIN / DF	< 2,0	2,4
p-value χ 2	> 0,05	0,0
RMSEA	0,03 - 0,08	0,14
NFI	> 0,90	0,85
CFI	> 0,90	0,90
χ 2/DF	<2,0	2,4

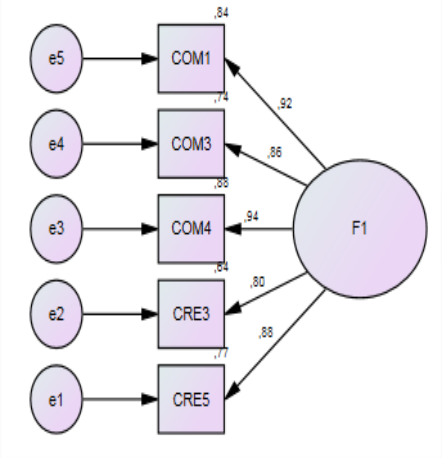
Source: Author analysis

This result also did not support the stream that discusses trust as a construct based on two dominant theoretical dimensions, and seems to be going in the direction that the constructs are operationally inseparable. Therefore, the proposed model was adjusted one more time to measure trust as a single dimensional construct and a new validity was conducted to confirm the theory.

4.2.4 Model with trust as a single dimensional construct - construct validity

In order to reflect a single-dimensional model for trust, all measurement items were combined into a single construct and then two new identical CFAs were conducted, one for the buyer sample and another for the supplier sample, until the final scale was obtained (Figure 8).

Figure 8: Model with single dimension trust



Source: Author analysis

The buyer model was run 5 times, and the variables HON3, CRE4, COM2 and HON1 were dropped in this sequence until reaching the best possible fit. The supplier model was also run 5 times and the same variables (HON3, CRE4, COM2 and HON1) were dropped until reaching the best fit. Results of the convergent validity for the final model are presented in Table 25.

The final model for both buyer and supplier samples was composed of 5 variables COM1, COM3, COM4, CRE3 and CRE5). All variables showed load factors in the range of 0,73 and 0,94 and Cronbach-α of 0,94 / 0,89 (buyer / supplier), and were considered acceptable.

Table 25: Construct validity- model with single dimension construct

Model	Item	Buyer	Supplier
Cronbach-α		0,94	0,89
Load factors	COM1	0,92	0,90
	COM3	0,86	0,73
	COM4	0,94	0,84
	CRE3	0,80	0,72
	CRE5	0,88	0,76

All loads were significant at 0,01 level
Source: author analysis

The finding that trust should be measured as a single dimensional construct brings an important implication for this research. The proposed hypothesis H1A-D and H2A-D that aimed to test the relationship between the individual dimensions of trust and performance could not be further tested because trust was reduced to a single dimensional construct.

Therefore, substitute hypothesis had to be drown to attain the objectives of measuring relationship between trust and performance, and the difference between buyer and supplier perceptions.
H1: Buyer´s trust is positively related to performance
H2: Supplier´s trust is positively related to performance

Based on that, all further measurements of trust were based on the average of four variables: COM1, COM3, COM4, CRE3 and CRE5.

4.2.5 Construct validity: conclusion

Two important conclusions can be drawn from the results of the validity tests: First, convergent validity indicated that respondents conceptually distinguish the four proposed dimensions of trust and that they could be considered for empirical studies in this area. Second, discriminant validity indicated that respondents do not differentiate among the different dimensions when the purpose is to measure trust on their counterpart.

In other words, although respondents conceptually distinguish between the different dimensions of trust, the end result is that they either trust the partner or not, regardless the dimension, and therefore trust should be measured as a single dimensional construct.

As a result, the proposed hypothesis H1A-D and H2A-D were substituted by
H1: Buyer´s trust is positively related to performance
H2: Supplier´s trust is positively related to performance

H3 was maintained because its objective is to compare buyer and supplier´s perspectives.

5 Analysis and results

Three questions should be considered in attempting to choose the significance test (Forza & Cipriano, 2002). (1) does the test involve one, two or k samples?; (2) If two samples or k samples are involved, are the individual cases independent or related?; (3) Is the measurement scale nominal, ordinal, interval or ratio? This research involved 2 independent samples and measurements were based on interval scales.

Based on the data distribution analysis that provided support for using parametric tests, Forza & Cipriano (2002) and Hair, Anderson, Tatham, & Black (2005) suggest different parametric tests that can be used to compare one or two samples (Table 26).

Previous studies that proposed similar models to compare buyer and supplier perceptions of the same relationships have used two separate statistical validity tests to conduct the analysis (Ganesan, 1994; Johnston et al., 2004; Kwon & Suh, 2004; Liu et al., 2009; Nyaga et al., 2010; Svensson, 2001; Whipple & Frankel, 2000; Zaheer et al., 1998): one test performed to compare the differences between buyer and supplier perceptions (H3), and one test to predict the relationship between the independent and dependent variables, which in this case is the relationship between trust and performance (H1 and H2).

Table 26: Example of parametric tests

Test	**When used**	**Function**
Regression	Nominal data, one sample	Model relationship between one dependent variable and one or more independent variables
Chi-squared (Chi-2)	Nominal data for two or more independent samples	Test for equality of distributions
t-test	Nominal data for two or more independent samples	Test for equality of means
Structural Equation Modelling (SEM)	Nominal or ordinal data, one sample	Concurrently confirm entire measurement structures
Path analysis	Nominal data, one sample	Describe directed dependencies among a set of variables

Source: author analysis

Regression models have been used in previous research to predict the relationship between trust and performance (Ambrose et al., 2010; Ganesan, 1994; Liu et al., 2009), and this study will follow this procedure by having two linear regression models with logistics performance as the single-dependent variable and trust as the independent variable: one for the buyers samples (H1), and one for the supplier sample (H2).

The different perceptions of the dimensions of trust between buyers and suppliers (H3) was tested with t-test of the means based on past surveys that compared same constructs from two independent samples. For example, Dyer & Chu (2000) used t-tests to compare sample means to determine the levels of trust between US and Japanese automotive manufacturers; Frohlich & Westbrook, (2001) used paired t-tests to compare the degree of integration in supplier and customer strategies; Whipple & Frankel (2000) compared mean responses of factors that contribute most to long-term alliance success and if buyers and suppliers agree on those factors, and Ambrose et al. (2010) used a t-test on the mean values of the constructs to compare how buyers and suppliers perceive relationship mechanisms.

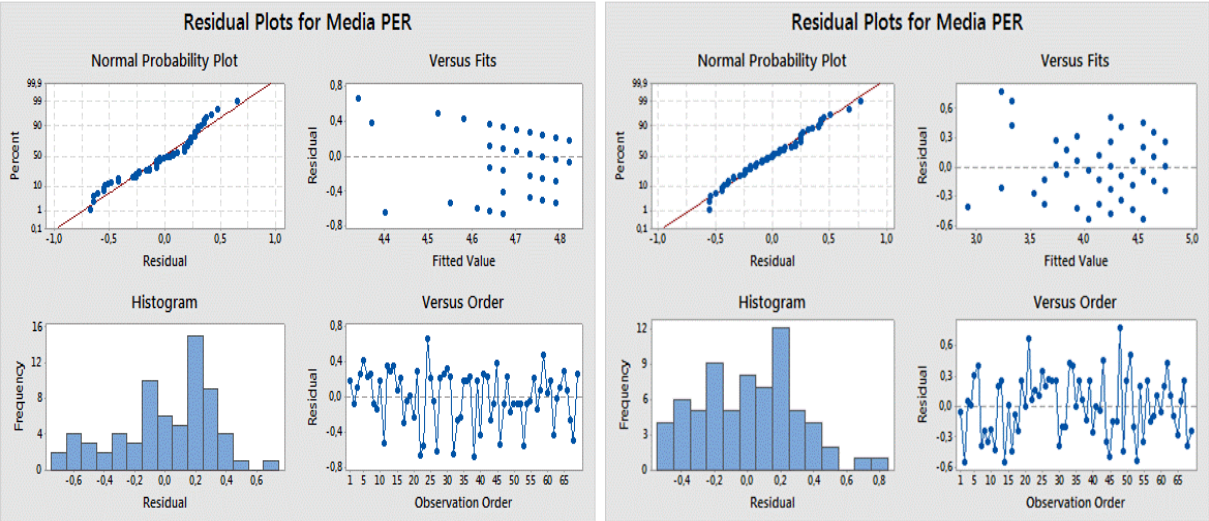
For hypothesis testing, the values of the items within each dimension were averaged (Kwon & Suh, 2004; Liu et al., 2009; Mullen, 1995) to obtain the first-order constructs (trust, benevolence, competence, credibility, honesty and performance). Results of these analysis will presented in this section, and the implications considered in the Discussion section (1.4).

5.1 Relationship between trust and performance

H1 and H2 were tested using two linear regressions, one for buyers only and one for suppliers only, with performance as the single-dependant variable and trust as the independent variable. In the process, 3 responses from the buyer sample and 7 responses from the supplier sample were removed after an examination of the residual distribution.

The residual plots of each model were analyzed (Figure 9) and indicated no problems with the correlation, supporting the final linear model.

Figure 9: Regression residual plots



Source: Author analysis

From the test results (Table 27), it can be said that the hypothesis are partially supported. The buyer sample reported a R-squared of 0,68, the regression error accounted for 70% of the total error, and the regression coefficient was positive 0,51. This shows that the model explains a large part of the variance of the trust variable, and therefore H1 is supported.

However, the supplier sample reported a R-squared of 0,10, the regression error accounted for 10% of the total error, and the regression coefficient was positive 0,15, showing that the model does not explain the relationship between trust and performance. Therefore, H2 is not supported.

Table 27: Regression results

Result	**Buyer**	**Supplier**
Constant	2,22	4,06
Coefficient	0,51*	0,15*
R-sq	0,68	0,10
R-sq (adj)	0,67	0,92

*significant at p<0,01 level
Source: Author analysis

Therefore, it is possible to conclude that it´s the buyer´s perception of trust towards the supplier that ultimately lead to an increase in performance.

5.2 Comparing buyer and supplier perceptions

H3 proposes that buyers and suppliers have different perceptions of the relationship, and was tested by comparing the mean values of the constructs for buyers and suppliers using a t-test. Table 28 shows that, on a five-point scale, differences are statistically significant for trust (-0,28; p-value 0,04), competence (-0,30, p-value 0,03) and performance (-0,34, p-value 0,00). The negative differences of the mean values indicate that in these dimensions buyers have a more negative perception towards suppliers than suppliers towards buyers.

H3 for trust is accepted, there is evidence that buyers and suppliers have different perceptions of trust. H3 for competence is accepted, there is evidence that buyers and suppliers have different perceptions, and the negative difference means that buyers perceive suppliers to be less competent than suppliers perceive buyer´s competence. H3 for performance is also accepted, there is evidence that buyers and suppliers have different perceptions and the negative difference means that suppliers´ perception of their performance is better than buyer´s perception.

Table 28: Equality of means for buyer and supplier samples

	Buyer		**Supplier**		**Difference of means**			
Construct	**Mean**	**Std Deviation**	**Mean**	**Std Deviation**	**Estimate**	**T-value**	**p-value**	**Accept H3***
Trust	3,90	0,89	4,26	0,72	-0,28	-2,05	0,04	Yes
Benevolence	3,81	0,85	3,57	0,89	0,24	1,70	0,09	No
Competence	3,95	0,92	4,26	0,77	-0,30	-2,14	0,03	Yes
Honesty	3,74	0,78	3,87	0,77	-0,13	-1,06	0,29	No
Credibility	3,97	0,78	4,12	0,74	-0,16	-1,24	0,21	Yes
Performance	4,24	0,55	4,58	0,58	-0,34	-3,70	0,00	Yes

Source: Author analysis

* H3 implies that there is a difference in means, therefore H3 is accepted if the t-test is rejected

H3 for benevolence, honesty and competence are rejected, there is no evidence that buyers and suppliers have different perceptions from their counterparts. However, despite the test indicates that perceptions are similar for benevolence, the estimated difference is the highest among the dimensions (0,24 points) and the positive p-value of 0.9 may be an indicative that this dimension may also have a relevant gap from buyers towards suppliers, and further investigation would be necessary.

6 Discussion and implications to theory and management

This section will reconcile the main objectives of the research with the literature review (examine the impact of each dimension of trust on logistics performance and investigate the perceived similarities and differences from buyer and supplier perspectives) and the conclusions from analysis previously carried-out, and is structured in three topics: The first will discuss the multidimensionality aspect of trust when defining measurement instruments, followed by a discussion on the different perspectives that buyers and suppliers have of their relationships, and conclude with the relationship between trust and performance.

6.1 Discussion: trust operationalized as a multi dimensional construct

Results bought some light in the ongoing academic debate if trust should be operationalized and measured as a multidimensional construct with non dominant theoretical dimensions, based only on two dominant theoretical dimensions, or as a single global construct (Andersen & Kumar, 2006; Doney & Cannon, 1997; Zaheer et al., 1998). The conclusion of this research is that trust can be defined as a multi-dimensional construct, but should be measured as a single, global construct, or by one specific dimension, and not as a multi-dimensional construct. It also suggests that there is still a need for academic researchers to revisit and converge measurements and scales to better understand this subject.

Although the reviewed articles showed that studies mostly used two dimensions to measure trust (section 2.5), convergent analysis of the constructs confirmed that trust can be defined as a multidimensional construct, and that the four proposed dimensions (benevolence, honesty, competence and credibility) are perceived differently by buyers and suppliers

However, the high correlation among constructs found in the discriminant analysis supported authors that suggest that interorganizational trust should be measured as a single, global construct (Medlin & Quester, 2002; Seppänen et al., 2007). Although this contradicts the other two streams of research that found discriminant validity in two dominant dimensions (affective and calculative) or when modeled other dimensions, the ambiguity in how

constructs are defined and measured may be the cause why it is not possible to provide a definite and firm point of view on this matter.

One possible reason for finding correlations among the constructs close to unity is that the results may be artifacts of measurement equivalence, such as translation, metric, and calibration. Despite this research has followed the recommended procedures to develop and validate the measurement instruments, such as adapting full scales, doing reverse translation and pre-testing the questionnaire, it was based on previous research that were subject to variables that will be discussed in the following examples.

Examples of how the multidimensionality of trust is still a not resolved area and may be reflecting in the scales and measurement items is the ambiguity in how the dimensions have been defined were presented earlier in sections 2.5.2 and 3.2. This was evidenced by the fact that same terminologies have been used for different construct or different names have been used for similar constructs. Terms such as "honesty" have been employed in scales to measure credibility (Doney & Cannon, 1997; Ganesan, 1994), or terms like "keep promises" were used to measure credibility (Doney & Cannon, 1997), reliability (Zaheer et al., 1998) or honesty (Corsten et al., 2011).

Another example is that there are too many scales for similar constructs, where the selected measurement items do not provide continuity in measurement instruments or were validated without demonstrating that a scale development methodology was employed (Table 29).

For instance, Kumar, Scheer, & Steenkamp (1995) is a common article that has been cited for a long time as a reference for the scale of trust based on benevolence and credibility. Instead of building on each other, some subsequent articles from 2004 to 2011 combined or adapted the items from that study into new and different scales to measure trust based on the same dimensions (Corsten et al., 2011; Kwon & Suh, 2004; Liu et al., 2009). At the same time, they did not provide a discussion on why their scales differ.

Table 29: Items used to measure benevolence and credibility

	Original Items - Author	Adapted Items - Authors		
Construct	**Kumar, 1995**	**Corsten et al., 2011**	**Liu, Luo, & Liu, 2009**	**Kwon & Suh, 2004**
Benevolence	Though circumstances change, we believe that the supplier will be ready and willing to offer us assistance and support.		*	*
	When making important decisions, the supplier is concerned about our welfare.		*	*
	When we share our problems with the supplier, we know that it will respond with understanding.	*		*
	In the future, we can count on the supplier to consider how its decisions and actions will affect us.		*	*
	When it comes to things that are important to us, we can depend on the supplier's support	*	*	*
Honesty	Even when the supplier gives us a rather unlikely explanation,we are confident that it is telling the truth.	*		*
	The supplier has often provided us information that has later proven to be inaccurate.			*
	The supplier usually keeps the promises that it makes to our firm.	*		*
	Whenever the supplier gives us advice on our business operations, we know that it is sharing its best judgment.	*		*
	Our organization can count on the supplier to be sincere.		*	*

* indicate same measurements used in article
Source: Author analysis

In conclusion, even after so many years of studying this subject in academic research, the multidimensionality of trust still has to be better understood before proposing one direction, and it is recommended to start converging measurements and scales in three aspects:

- Provide more clear and unique definitions of the dimensions of trust;
- Revisit existing measurement instruments for trust instead of constantly creating or adapting new ones to confirm which are more adequate to measure the different dimensions of trust;
- Be more rigorous in supporting and discussing the multi-dimensionality of trust and the development of new scales when not considering it as a single dimensional construct

6.2 Discussion: Different perceptions on trust between buyers and suppliers

One objective of this study was to investigate the perceived similarities and differences of the dimensions of trust from the same two perspectives. (buyer and supplier), and it brought new and relevant insights by showing that perceptions are different in the more measurable aspects of the relationship (competence and performance), and not in the subjective aspects (honesty and benevolence). Results confirmed that trust seems to be present in the relationships, and that buyers have a more negative perception of suppliers on trust (mean 3,9 buyer / 4,2 supplier on a 5 point scale, p-value 0,04). Moreover, it also showed that buyer and suppliers perceptions differ in competence (mean 4,0 buyer / 4,3 supplier, p-value 0,03) and performance (mean 4,2 buyer / 4,6 supplier, p-value 0,0), while no gaps were perceived in the social aspects of trust (honesty p-value 0,29 and benevolence p-value=0,09). This raised an interesting debate on what could be the cause for such results.

The confirmation of the similar perceptions on the social dimensions (represented by benevolence and honesty) was raised by Barnes, Naudé, & Michell (2007) and may be explained by the fact that these could be qualifying factors in a relationship. For example, Zaheer & Venkatraman (1995) suggested that the presence of trust as an explanatory factor of governance may be due to effects presented at the time of the formation of the relationship. In another example, Claycomb & Frankwick (2010) explored interaction mechanisms that drive relationship characteristics when buyers seek close ties with key suppliers. In their literature review they discussed that the processes that should be present in a relationship to lay the foundation for successful relationship, and trust was considered a major component comprising reputation. In the same direction, Blomqvist (1997) noted in his literature review that belief and behavioral intention must be present for trust to exist.

A possible reason for the different perceptions in the more measurable dimensions (competence and performance) may be related to environmental and cultural issues specific to the context of this research (services in Brazil), a variable that has been identified in previous studies (Delbufalo, 2012; Mullen, 1995; Villena et al., 2011).

Brazil seems to be a country of low interpersonal trust culture. According to the Global Interpersonal Trust Map (ASEP/JDS, 2014), it occupies one of the lowest positions in the relative perception of interpersonal trust, and a report conducted by the national industry

association (Confederação Nacional da Indústria - CNI, 2014) showed that 82% of the respondents believe that most people tend to take advantage from the other in a relationship instead of acting correctly. In other words, there an indication that people may not trust each other in Brazil.

The theoretical perspectives discussed in the literature review (TCE, SET and Marketing Channels) proposed that opportunism, bounded rationality and environmental uncertainty impact measurement and monitoring costs. In cases like this, companies may either limit resources to measure performance and rely on more informal governance based on relational trust and were communication plays an important role, or spend resources to create more complex governance mechanisms (Poppo & Zenger, 2002; Rindfleisch & Heide, 1997).

The conclusion of this research is that perceptions on trust between buyers and suppliers may be a result of the circumstances of the sample been studied. By being an emerging country with high environmental uncertainty and low interpersonal trust (ASEP/JDS, 2014; Confederação Nacional da Indústria - CNI, 2014; Poppo & Zenger, 2002; Rindfleisch & Heide, 1997), it is possible that companies tend to limit the resources and rely on more informal governance and inadequate measurement instruments, leading to an imbalance in the perception of these dimensions and the high perception gap identified in the research.

It is reasonable to accept this conclusion based on an non-academic research conducted in the year of 2014 by a leading logistics software provider in Brazil (Visão embarcadores de carga Brasil, 2015) with major buyers of logistics services. According to this report, a major goal for 90% of buyers of logistics services is to reduce costs and 74% of them will accomplish that through new biddings. Also, the major recurring problems with their suppliers are lack of information (64% of respondents) and variability in service levels (58% of respondents). On the supplier side, there is a general managerial perception that logistics service suppliers are operating under operational stress

In summary, this study showed that trust seems to be present in the relationships, but buyers have a more negative perception of suppliers on measurable dimensions of trust (competence and performance), while no perception gaps in the social aspects of trust (honesty and benevolence). It also concluded that the different perceptions on trust between buyers and suppliers may be a result of the circumstances and the environment.

6.3 Discussion: Relationship between trust and performance

The empirical studies discussed in the literature review showed that there is a positive correlation between trust and performance, or in other words, it is expected that logistics performance increases with trust (Barnes et al., 2007; Z. Chen et al., 2011; Ha et al., 2011; Nyaga et al., 2010), and this study provided two interesting conclusions.

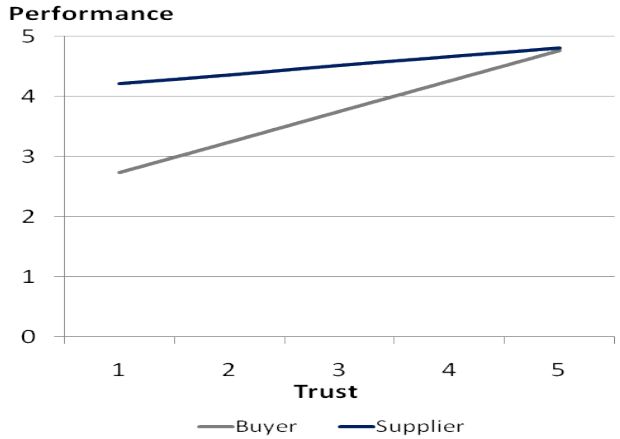
First, it concluded that trust should be measured as a single-dimensional construct driven by competence and credibility. These findings are in line with previous literature which have found that, as long as some trust is in evidence there is an impact on performance for either the buyer or the supplier (Ambrose et al., 2010). The regression model also supported previous studies which suggest that the strongest antecedent for relationship performance for buyers is credibility from the supplier (Ambrose et al., 2010; Zaheer et al., 1998). In the same study, Ambrose et al (2010) did not report a direct relationship between benevolence and relationship performance for the buyer or the supplier, suggesting that it does not play a role in performance.

Second, it showed that it´s the buyer´s perception of trust towards the supplier that ultimately lead to an increase in performance and that, as the level of trust increases the perception gap from buyers and suppliers on performance tends to decrease. The graphic representation of the regression analysis that measured the relationship between trust and performance (Figure 10) suggests that an increase in perceived trust from the buyer towards the supplier (regression coefficient = 0,51, R^2=0,68) has a greater impact on performance than an increase in perceived supplier´s trust from the supplier towards the buyer (regression coefficient = 0,15, R^2=0,10).

This results bring new evidence that, contrasting from the main proposal from TCE, SET and RM, the relationship between trust and performance may not be applicable to buyers and suppliers in the same manner. One possible reason may be related to power and dependence, which are relationships characteristics that influences buyer-supplier relationships. For example, a case study that examined asymmetric interfirm transactional relationships showed that actions that aim to foster trust appear to a calculative strategy developed only by the more dependent partners to limit transactional risk (Donada & Nogatchewsky, 2006). Similarly, a study in UK food supply channels, where control lies in few large retailers (Hingley, 2005),

trust exists to some degree but its expression is often at the order of the retailer. The effect of dependence may be a characteristics of the sample in this study, where since 68% of buyers classified their partner as a transportation company (against 28% of suppliers), which belong to a segment that is more commoditized and where the supplier is more dependent of the buyer.

Figure 10: Relationship between trust and performance



Source: Author analysis

In summary, this study confirms the positive relationship between trust and performance, the relationship between the perception gaps in the relationships with trust and performance, and proposes that is the buyer´s perception of trust that ultimately drives performance.

7 Contribution, areas for further development and limitations

This research bought three main contributions for knowledge and management. First, it provided a distinct analysis on the existing ambiguity in how the dimensions of trust are defined and measured, and how this ambiguity may lead to different conclusions on similar studies. As a result, it suggested that further research should start converging the definitions, measurement scales and items, prioritizing the use of existing scales rather than adapting new ones.

A suggestion for future study that could go in this direction could be a meta-analysis research, since it has been recommended in similar situations. For example, Swan, Bowers, & Richardson (1999) based his report on a meta-analysis to contribute to the development of the topic customer trust of salespeople, Delbufalo (2012) used this methodology to improve the understanding of inter-organizational trust outcomes in supply chain relationships, and Terpend, Tyler, Krause, & Handfield (2008) suggested that meta-analysis should be used to one research questions focused on what scholars have studied over the past.

Second, it built on the discussion of the multi-dimensionality of trust by supporting the stream of research where trust should be measured as a one, global dimension (Corsten et al., 2011; Medlin & Quester, 2002; Zaheer et al., 1998), instead of a multi-dimensional construct or based on two dominant dimensions of affective and competence trust (Andersen & Kumar, 2006; E. Anderson & Weitz, 1989; Dyer & Chu, 2000). This was obtained by empirically testing four commonly cited dimensions of trust in one specific model, which is significantly different from other studies that modeled trust with only two constructs (Ganesan, 1994; Ha et al., 2011; Johnston et al., 2004; Svensson, 2001).

The third contribution is that this study advanced the discussion about the different perspectives that buyers and suppliers have in their relationships. Although previous research have already indicated that the perceptions may differ in certain aspects (Johnston et al., 2004; Svensson, 2001), this study empirically showed that buyers tend to have a more negative perception of suppliers in credibility and performance dimensions, and it is the buyer´s perception that ultimately leads to an increase in performance.

These findings may also bring managerial contributions. First, management should be more conscious that buyer and supplier perceptions of their relationships are built on several dimensions (benevolence, honesty, credibility and competence), but the final perception is a result of one, global dimension. In other words, either you trust or not, and failing in only one dimension may result in a low trust relationship. Managers should also be aware of the relevance of measurable dimensions such as credibility and performance, and that relational aspects may be qualifying factors. Finally, in environments of high uncertainty, opportunistic behaviors and operational stress, such as Brazil´s, buyers and suppliers should use their governance models and communication efforts to align the perceptions around these measurable dimensions.

Two important limitations of this study are related to the problem of endogeneity, an area recently stressed by Guide Jr. & Ketokivi (2015): the research was based on a cross sectional survey, which may not correctly establish causality, and it relied on a single informant for each organization, which may lead to common method bias.

It is important to mention that the cross sectional limitation is common in operational management research and has been identified in the literature review. For example, the difficulty in getting longitudinal data and the opportunity for further research on buyer–supplier relationships to focus on longitudinal studies was raised by Nyaga et al., (2010), who suggested the use of longitudinal studies because relationships are time dependent, long-term in nature and may take time to develop, and it is likely that buyer and supplier perceptions of relationship vary over time. Z. Chen, Huang, & Sternquist, (2011) also recognized that cross-sectional designs limit the ability to rule out alternative causal inferences, and suggested to employ longitudinal design for further model testing.

A recommendation for future studies is to complement this empirical research with qualitative case studies based on matched dyads. This would enable involvement of respondents from multiple levels in the organizations and the combination of other sources of data, such as management reports, performance reviews and meeting notes, and provide a better understanding of the mechanism by which different perceptions of relationships develop and their consequences to performance.

This is a similar recommendation, although in an opposite direction, of previous research that based their methodology on case studies to analyze interorganizational trust. Past qualitative studies have recognized that further validation of the results through empirical data collection and meaningful sample sizes was a limitation to be further explored (Barnes et al., 2007; Donada & Nogatchewsky, 2006; Johnsen & Ford, 2008). In other words, complementing this empirical study with case studies would enable the researcher to have access to other sources of information and explore the temporality nature of the existing relationships.

As a final remark, this study was conducted in one country (Brazil) and one service industry (logistics), and findings may not be generalizable beyond this sample. Given that social relations are dependent upon cultural context (Delbufalo, 2012; Mullen, 1995; Villena et al., 2011) it will be interesting to replicate this study in other countries, but in similar service context.

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9 Appendix:

Appendix 1: Number of articles according to key words and journals

		Key Words and Strings Used				
		Trust and relationship	Trust and Supply Chain			
		Trust and performance	Trust and Services		Buyer-seller relation*	
Journal	Impact Factor	Trust and interorganization*	Trust and Logistics	Review and interorganization*	Buyer-supplier relation*	Total
Total articles from EBSCO (first phase)		1.005	606	22	787	1.814
The academy of management review	7,8	8		1		9
British journal of management	1,9	7			2	9
European journal of operational research	2,7					-
Industrial marketing management	1,9	31	2	1	68	100
International journal of operations and production management	1,5		1		10	10
Journal of business logistics	2,8				3	3
Journal of management	6,8	3		2		5
Journal of management studies	3,2				2	3
Journal of marketing	3,8	7			12	19
Journal of operations management	4,4	2	3		44	46
Journal of supply chain management	3,7		1		19	19
Management science	2,5		1		4	4
Organization science	3,8	6				6
Strategic management journal	3,0	2			3	5
Supply chain management: an international journal	2,9					-
International Journal of Production Research	1,3				4	4
Decision sciences	1,6		3			-
Administrative science quarterly	2,3					-
Total from relevant journals (second phase)		66	11	4	171	242
After uniqueness and objectivity (third phase)		17	2	1	17	35

Source: 2013 JCR Social Science Edition, Author analysis

Appendix 2: Invitation Letter

Caro XXX

A XXXX está apoiando a Fundação Getúlio Vargas (FGV) numa importante pesquisa acadêmica cujo objetivo é entender o impacto na performance pelas diferentes percepções do relacionamento entre embarcadores e seus prestadores de serviços logísticos.

Estamos convidando profissionais do setor a responderem sobre aspectos do relacionamento entre sua empresa e seus clientes/fornecedores, pois cada empresa, cliente ou fornecedor possuem aspectos específicos e queremos capturar esta diversidade. Esta pesquisa levará menos de 5 minutos para ser respondida, e não serão solicitados nomes de empresas, de pessoas ou informações confidenciais. Garantimos que todos os dados individuais coletados serão mantidos em sigilo e os resultados serão anônimos.

O respondente deve trabalhar na área de suprimentos/logística/supplychain, com cargos direção, gerência ou supervisão.

Se você for um **CLIENTE/EMBARCADOR**, clique aqui para iniciar a pesquisa
Ou copie o seguinte endereço abaixo no seu navegador: https://pt.surveymonkey. Com/r/xxxx

Se você for um **FORNECEDOR DE SERVIÇOS LOGÍSTICOS**clique aqui para iniciar a pesquisa
Ou copie o seguinte endereço abaixo no seu navegador: https://pt.surveymonkey. Com/r/xxxxx

Em retribuição a sua participação, você será convidado a participar de um encontro na FGV onde será apresentado um sumário dos principais resultados da pesquisa, incluindo recomendações para uma gestão mais eficaz do embarcador/prestador de serviços.

Caso tenha alguma questão ou comentário, por favor contate Claudio Minerbo (claudiominerbo@terra. Com. Br)

Atenciosamente

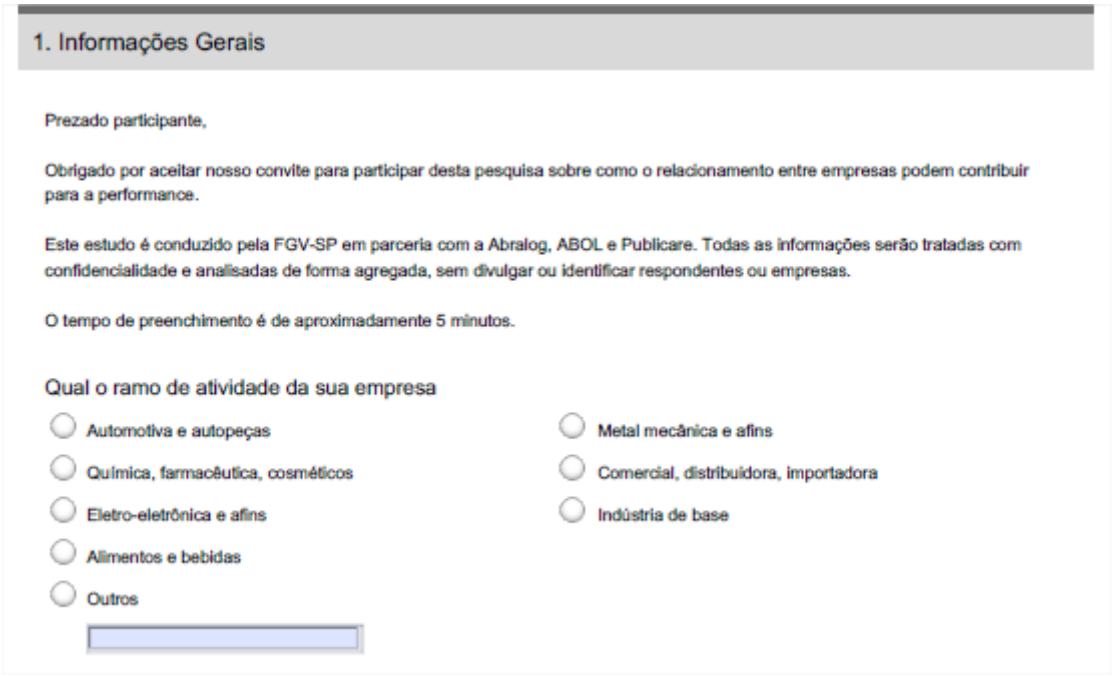
Claudio Minerbo

Appendix 3: Measurements for the dimensions of trust - Portuguese version

Construct	Code	Question	Adopted from
Credibilidade	CRE1	É necessário ser cauteloso com esse cliente/fornecedor	Frederico & Parente, (2008)
	CRE2	O cliente/fornecedor nem sempre é honesto conosco	
	CRE3	Acreditamos nas informações passadas pelo cliente/fornecedor	
	CRE4	O cliente/fornecedor cumpre o combinado	
	CRE5	O cliente/fornecedor é confiável	
Benevolência	BEN1	O cliente/fornecedor é genuinamente preocupado com os nossos negócios	Frederico & Parente, (2008)
	BEN2	Quando toma decisões importantes, o cliente/fornecedor também olha o nosso lado	
	BEN3	O cliente/fornecedor se preocupa com as nossas prioridades	
Honestidade		Este cliente/fornecedor [...]	Svensson, 2001
	HON1	[...] sempre tenta nos informar quando algum problema ocorre	
	HON1	[...] sempre provê as informações que pedimos	
	HON3	[...] nunca tenta esconder algo importante que possa nos influenciar negativamente	
Competência		A forma que ele opera seu negócio me faz pensar que este cliente/fornecedor [...]	Cho, 2006
	COM1	[...] tem expertise em seu negócio	
	COM2	[...] sabe o que está fazendo	
	COM3	[...] é competente	
	COM4	[...] é proficiente ou capacitado	
Performance		Versão do Cliente: Este fornecedor atinge [...] Versão do fornecedor: Nós atingimos [...]	Ambrose et al., 2010
	PER1	[...] nossas expectativas do correto processamento dos pedidos	
	PER2	[...] nossas expectativas de pedidos entregues sem danos	
	PER3	[...] os custos acordados	
	PER4	[...] nossos padrões de entrega dentro do prazo	

Source: Author analysis

Appendix 4: Copy of the questionnaire - supplier version



1. Informações Gerais

Prezado participante,

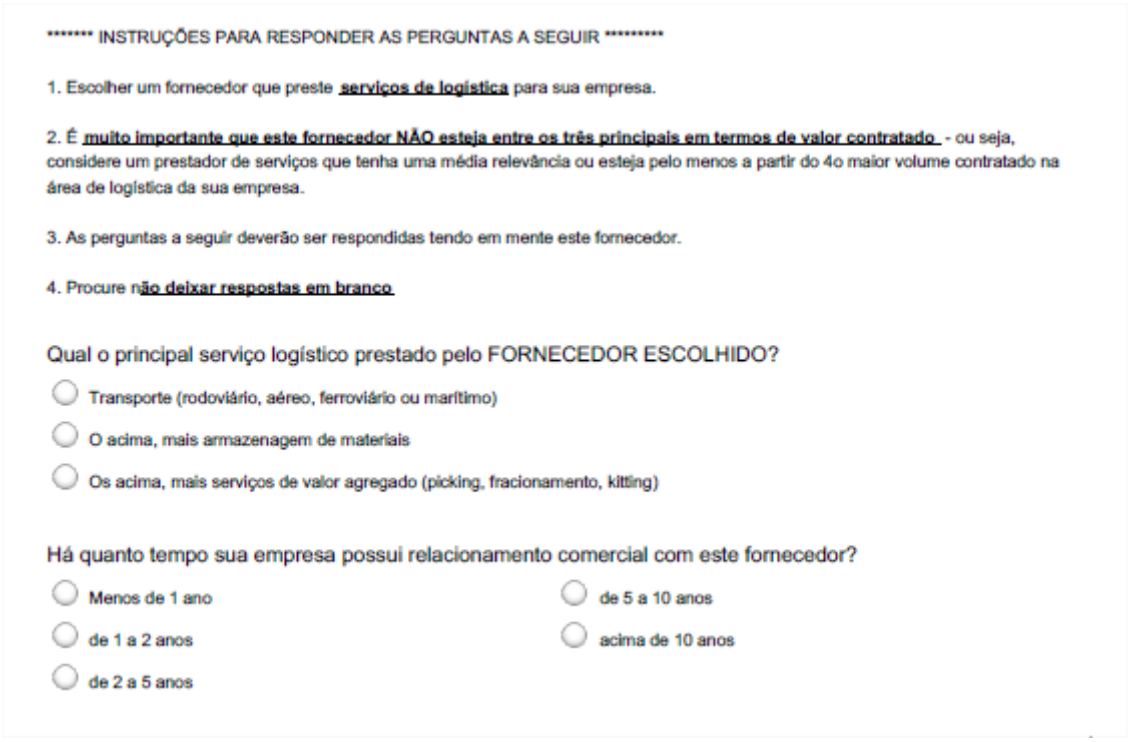
Obrigado por aceitar nosso convite para participar desta pesquisa sobre como o relacionamento entre empresas podem contribuir para a performance.

Este estudo é conduzido pela FGV-SP em parceria com a Abralog, ABOL e Publicare. Todas as informações serão tratadas com confidencialidade e analisadas de forma agregada, sem divulgar ou identificar respondentes ou empresas.

O tempo de preenchimento é de aproximadamente 5 minutos.

Qual o ramo de atividade da sua empresa

- ◯ Automotiva e autopeças
- ◯ Química, farmacêutica, cosméticos
- ◯ Eletro-eletrônica e afins
- ◯ Alimentos e bebidas
- ◯ Outros
- ◯ Metal mecânica e afins
- ◯ Comercial, distribuidora, importadora
- ◯ Indústria de base



******* INSTRUÇÕES PARA RESPONDER AS PERGUNTAS A SEGUIR *********

1. Escolher um fornecedor que preste **serviços de logística** para sua empresa.

2. É **muito importante que este fornecedor NÃO esteja entre os três principais em termos de valor contratado** - ou seja, considere um prestador de serviços que tenha uma média relevância ou esteja pelo menos a partir do 4o maior volume contratado na área de logística da sua empresa.

3. As perguntas a seguir deverão ser respondidas tendo em mente este fornecedor.

4. Procure n**ão deixar respostas em branco**

Qual o principal serviço logístico prestado pelo FORNECEDOR ESCOLHIDO?

- ◯ Transporte (rodoviário, aéreo, ferroviário ou marítimo)
- ◯ O acima, mais armazenagem de materiais
- ◯ Os acima, mais serviços de valor agregado (picking, fracionamento, kitting)

Há quanto tempo sua empresa possui relacionamento comercial com este fornecedor?

- ◯ Menos de 1 ano
- ◯ de 1 a 2 anos
- ◯ de 2 a 5 anos
- ◯ de 5 a 10 anos
- ◯ acima de 10 anos

* Qual o valor aproximado contrato com este fornecedor (em R$/ano, com base no último ano fiscal)

- ○ até R$ 1 milhão
- ○ de R$ 1 a 3 milhões
- ○ de R$ 3 a 5 milhões
- ○ de R$ 5 a 10 milhões
- ○ de R$ 10 a 20 milhões
- ○ acima de R$ 20 milhões

Caso deseje receber uma cópia do sumário executivo desta pesquisa, por favor informe seu email de contato, ou deixe em branco se preferir

Email Address

2. Questionário

Por favor, indique seu grau de concordância para a prática de cada uma das afirmações abaixo conforme classificação que segue:

1- Discordo totalmente
2- Discordo em grande parte
3- Discordo parcialmente
4- Nem discordo Nem Concordo
5- Concordo parcialmente
6- Concordo em grande parte
7- Concordo totalmente

Pensando no relacionamento com o fornecedor escolhido, considero que:

	Discordo totalmente 1	2	3	4	5	6	Concordo totalmente 7
Este fornecedor sempre cumpre o combinado	○	○	○	○	○	○	○
Este fornecedor se preocupa com as nossas prioridades	○	○	○	○	○	○	○
Este fornecedor sempre provê as informações que pedimos	○	○	○	○	○	○	○
A forma que ele opera seu negócio me faz pensar que este fornecedor sabe o que está fazendo	○	○	○	○	○	○	○
Quando toma decisões importantes, esse fornecedor também olha o nosso lado	○	○	○	○	○	○	○
É necessário ser cauteloso com esse fornecedor	○	○	○	○	○	○	○
Este fornecedor nunca tenta esconder algo importante que possa nos influenciar negativamente	○	○	○	○	○	○	○
A forma que ele opera seu negócio me faz pensar que esse fornecedor é competente	○	○	○	○	○	○	○
Este fornecedor nem sempre é honesto conosco	○	○	○	○	○	○	○
Este fornecedor sempre tenta nos informar quando algum problema ocorre	○	○	○	○	○	○	○
Acreditamos nas informações passadas por esse fornecedor	○	○	○	○	○	○	○
A forma que ele opera seu negócio me faz pensar que esse fornecedor é capacitado	○	○	○	○	○	○	○
Este fornecedor é genuinamente preocupado com os nossos negócios	○	○	○	○	○	○	○
A forma que ele opera seu negócio me faz pensar que esse fornecedor tem expertise em seu negócio	○	○	○	○	○	○	○
Este fornecedor é confiável	○	○	○	○	○	○	○

Pensando na performance do fornecedor escolhido, voce diria que:

	Discordo totalmente 1	2	3	4	5	6	Concordo totalmente 7
Este fornecedor atinge nossas expectativas do correto processamento do pedido	○	○	○	○	○	○	○
Este fornecedor atinge nossas expectativas de pedidos entregues sem danos	○	○	○	○	○	○	○
Este fornecedor atinge os custos acordados	○	○	○	○	○	○	○
Este fornecedor atinge nossos padrões de entrega dentro do prazo	○	○	○	○	○	○	○