

# Thinking outside the box: a neuroscientific perspective on trust in B2B relationships

Trust in B2B  
relationships

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Received 6 March 2017  
Revised 31 August 2017  
Accepted 5 September 2017

## Abstract

**Purpose** – The concept of trust suffers from conceptual confusion. The current perspectives on trust within the B2B marketing domain could be visualised as a big box of which the borders are defined by the disciplines marketing, economics, psychology and sociology. The purpose of this paper is to enlarge the box by introducing neuroscientific insights on trust to the B2B marketing domain.

**Design/methodology/approach** – By a literature study on neuroscientific insights on trust, this paper examines how neuroscience can help to solve existing problems within trust research and how it can address problems that otherwise might not be considered.

**Findings** – The neural coordinates of trust not only show that trust entails cognitive and affective elements, but also that these elements are so intertwined that they cannot be completely separated. What can and should be separated are the concepts of trust and distrust: the neural coordinates of trust are clearly different from the neural coordinates of distrust. Furthermore, there are personal differences in the ease of trusting others, which are not only caused by previous experiences but also by differences in resting patterns of frontal electroencephalographic asymmetry and by differences in hormonal state.

**Research limitations/implications** – Specifically, the neural difference between trust and distrust might shape the future research agenda for trust research within industrial marketing. It is likely that the process of distrust goes quick, whereas trust comes more slow. This is reflected in the dual processing theory, which is seen as a paradigm shift in the psychology of reasoning.

**Originality/value** – New perspectives and directions for trust research are presented. The distinction between trust and distrust is connected to approach- and avoidance-motivated behaviour, which is highly relevant for deepening the studies on trust within industrial marketing.

**Keywords** First impressions, Trust, Distrust, Neuroscience, Approach-avoidance, SOR model

**Paper type** Conceptual paper

## Introduction

“When you trust people, you have confidence in them – in their integrity and in their abilities. When you distrust people, you are suspicious of them – of their integrity, their agenda, their capabilities, or their track record. It’s that simple” (Covey, 2006, p. 5). The popularity of the book *The Speed of Trust* by Stephen Covey shows the resonance of the concept of trust in practice. But is it really “that simple”? The past decades marketing scholars have racked their brains on the concept of trust. Specifically, within the B2B marketing domain, the concept of trust has dominated the scientific literature (Young *et al.*, 2015). Despite these academic efforts, the concept



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IMP Journal  
Vol. 12 No. 1, 2018  
pp. 75-110  
Emerald Publishing Limited  
2059-1403  
DOI 10.1108/IMP-03-2017-0011

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of trust is wrapped in a cloak of controversy (Mandják *et al.*, 2012; Castaldo *et al.*, 2010). The voyage of discovery towards the true meaning of trust has culminated in a heterogeneous pool of definitions and conceptualizations (Seppänen *et al.*, 2007; Akrouit and Akrouit, 2011).

This conceptual confusion would not be as big of a problem if the concept of trust would not have been so influential. However, trust forms the corner stone of business. Trust strongly influences relationship commitment, because the most valued relationships are those defined by trust; therefore, parties want to commit themselves to such relationships (Morgan and Hunt, 1994). And a committed customer is more likely to be a loyal customer and to promote the brand to other customers: “Interestingly, the effect of trust on satisfaction and long-term orientation is even substantially larger than the direct effect of economic outcomes (which is not significant) or any of the other antecedents. This attests to the key role of trust in marketing channels” (Geyskens *et al.*, 1998, p. 242). In other words, trust is crucial for the well-being of the firm. Therefore, it is only logical that the concept of trust has a substantial footprint on the academic literature within the field of industrial marketing in general, and on the research performed by the IMP Group, with its focus on business relationships, in particular. Within an era of constant change, the development of trust between actors in a business relationship even becomes more vivid in order to cope with the increased uncertainty associated with constant change and network dynamics (Sørensen *et al.*, 2011; Ford and Mouzas, 2010).

Is there a marketing topic by nature more interdisciplinary than trust? Trust is the cradle of every social interaction, not only interactions in business life. Therefore, the concept of trust is studied by scholars from a broad diversity of disciplines. These disciplines differ in their approach on the concept of trust (Blomqvist, 1997). It is argued that scholars within the field of industrial marketing are having a narrow perspective on trust: “[...] existing conceptualizations of trust in the literature view trust primarily from a cognitive/rationalistic viewpoint and in doing so ignore the more expressive aspects of human interaction” (Andersen and Kumar, 2006, p. 522). Therefore, scholars who study and measure trust would benefit from taking an interdisciplinary approach to enrich their own research scope.

The current perspectives on trust within the field of industrial marketing are rooted in marketing, economics, cognitive psychology and sociology (see also Appendix 1 for an exploratory bibliometric research on recent articles on trust published in *Industrial Marketing Management (IMM)*, *Journal of Business and Industrial Marketing (JBIM)* and *Journal of Business-to-Business Marketing (JBBM)*). It can be argued that scholars are, to some extent, thinking within a box and that new insights from other disciplines than the ones mentioned above are not integrated in the current models and conceptualisations. Specifically, within the field of neuroscience, studies on trust have produced valuable insights. The purpose of this paper is to introduce those insights to the B2B marketing domain and, by doing so, shape the future research agenda for trust research in industrial marketing.

The neuroscientific perspective is brought forward since it can be argued that current theories and empirical research on trust within a B2B context are not complete without “the most fundamental level of analysis” (Becker *et al.*, 2011, p. 934). In other words, can we fully grasp the relationship between trust and the resulting market behaviour if we do not take into account the neural processes that are at the heart of this relationship? The authors argue that we cannot and that a neuroscientific perspective on trust within a B2B context both enriches and advances the current knowledge on trust within the field of industrial marketing. The aim of introducing a neuroscientific perspective is not to replace the current knowledge, but to connect it with other knowledge in order to get a better picture. Therefore, integrating a neuroscientific perspective is a clear example of hierarchical reductionism in which unification of different fields of knowledge is the norm (Becker *et al.*, 2011; Pinker, 2002). Different research disciplines and accompanying perspectives must not be seen as competitors, but as complementary levels and grounds of analysis that together create synergetic effects. That is, neuroscientific

explanations of attitudes and behaviour should not be prioritised above social scientific explanations (also called neuroessentialism (Huettel *et al.*, 2009)), but should be seen as equal passengers on the same flight to a wonderful destination. By combining strengths, we are able to better understand the working mechanisms of trust in a B2B relationship. This paper explores how integrating a neuroscientific perspective on trust can create such synergetic effects by examining in which way neuroscience can shine a new light on existing problems and how it can highlight problems that might otherwise not have been considered.

### **B2B relationships and the relevance of trust**

B2B marketing has a lot of similarities with B2C marketing, causing scholars to challenge the classic dichotomy (e.g. Fern and Brown, 1984; Wilson, 2000; Cova and Salle, 2007). However, both at the intuitive and the empirical level, differences between B2B and B2C marketing have been stressed, specifically with respect to buying behaviour. One of the typical differences between consumer and industrial buying behaviour is the number of actors involved in the buying process – industrial buying is mostly characterised as being multiperson, i.e. as consisting of purchase groups instead of individual buyers (Wilson, 2000; Jaakkola, 2007; Johnston and Lewin, 1996; Lilien, 1987). In line with this difference lies a difference with respect to the character of the buying process – industrial buying behaviour is considered to be more professional of character and more regulated by decision guidelines (Jaakkola, 2007). However, if professional equals rational, as implicitly suggested in the early industrial marketing literature, can be questioned (Wilson, 2000). The complexity of the decision being made and the accompanied risk involved is seen as a third difference between consumer and industrial buying – the industrial buyer frequently has to deal with a higher level of complexity, both in product and in process, than a consumer buyer (Webster, 1978; Coviello and Brodie, 2001). This results in another typical difference between consumer and industrial buying behaviour, namely the number and intensity of contacts between buying and supplying actors – industrial buying behaviour is typically seen as a collaboration between buyers and suppliers, so, as a buyer-supplier relationship (Håkansson and Snehota, 1995). It is specifically this relational dimension that has been used to differentiate B2B from B2C marketing (Coviello and Brodie, 2001).

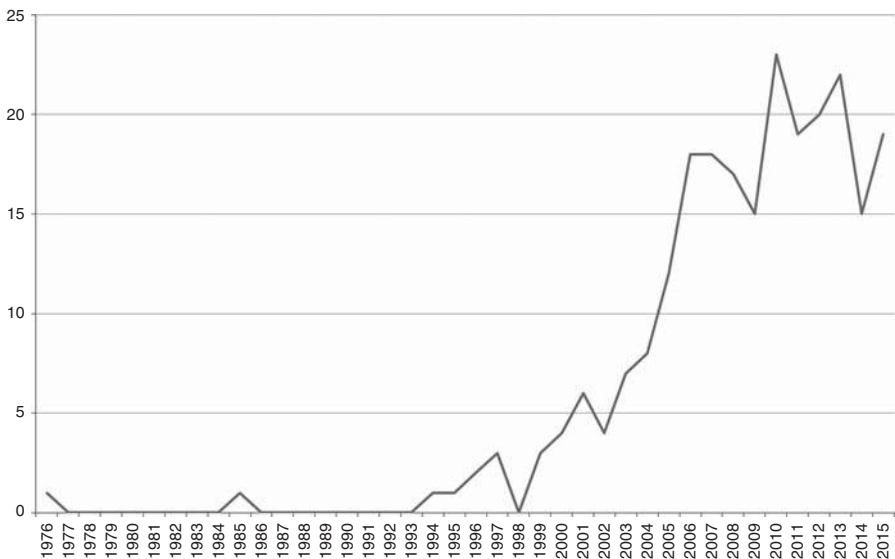
Therefore, it may come as no surprise that the focus on relationships by marketing scholars and practitioners originates from the B2B domain (Perrien and Ricard, 1995). To give just an intuitive example, the search term “B2B relationships” gets 4.110 hits on Google Scholar, whereas the search term “B2C relationships” gets only 802 hits (data retrieved on 7 July 2017). The focus on relationships by B2B marketing scholars, as compared to a focus on transactions, is grounded on the idea that it is more efficient to keep the current buyers as compared to attract new ones (Hunt and Morgan, 1994). However, relationships do not develop naturally. Buyer-seller differences have to be overcome, which is challenging since there are multiple persons, multiple elements and multiple episodes involved (Håkansson and Ford, 2016). “An integrative relationship assumes overlap in the plans and processes of the interacting parties and suggests close economic, emotional and structural bonds among them. It reflects interdependence rather than independence of choice among the parties; and it emphasizes cooperation rather than competition and consequent conflict among the parties; and it emphasizes cooperation rather than competition and consequent conflict among the marketing actors” (Sheth and Parvatiyar, 1995, p. 399). The IMP Group has studied B2B relationships from an interaction approach, in which there are two active parties (Ford, 1980). This resulted in viewing B2B relationships as a constant cyclical pattern of action and reaction. Within the interaction approach in general two research streams have been recognised: the

socio-cognitive perspective – focussing on the interpretation of informational cues by the market actors – and the practice-based approach – focussing on what market actors do (La Rocca *et al.*, 2015). Where those two general streams focus more on markets in general and implicitly assume that market actors are individuals, the IMP research stream considers actors as organisations or interactive multiperson entities.

When different business relationships are connected, one can speak of a business network (Anderson *et al.*, 1994). Good relationships between the actors of the network are crucial – since the success of each independent actor depends on the success of the other actors in the network – and a necessary ingredient of a good relationship is trust (Hunt and Morgan, 1994; Håkansson and Snehota, 2006). In general, the words “relationship” and “trust” are intertwined. A relationship can hardly exist without trust. The buyer-seller relationship has therefore been compared to a marriage, since both entail a complex nature and affective determinants (Perrien and Ricard, 1995). And for a marriage to succeed, trust is not only one of the basic ingredients; it is an absolute necessity.

### The concept of trust within the B2B marketing domain

With the transition from a transactional to a relational approach when describing business interaction, in which the IMP Group took a leading role, the concept of trust gained interest by many scholars. And it still does, considering the many publications on the topic in the three leading journals on B2B marketing (i.e. *IMM*, *JBIM* and *JBBM*) (see Figure 1). In the 1990s, the study of trust within a marketing context was, from a conceptual perspective, at its peak. Many articles published in that period (i.e. Morgan and Hunt, 1994; Doney and Cannon, 1997; Ganesan, 1994; Anderson and Narus, 1990; Anderson and Weitz, 1992; Moorman *et al.*, 1992; Zaheer *et al.*, 1998; Mayer *et al.*, 1995; Moorman *et al.*, 1993; Rousseau *et al.*, 1998) still form the dominant shoulders on which the current scholars lean (see also Appendix). Definitions, conceptual models and measurement scales with respect to the concept of trust have accumulated (Akrouf and Akrouf, 2011), and scholars studied the nature and the role of trust in relation to many other input and output variables, on which is elaborated below.



**Figure 1.** The number of articles with “trust” in title, abstract or keywords, published in *IMM*, *JBIM* and *JBBM*

Source: SCOPUS

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### *The nature of trust*

The first article on trust published in *IMM* conceptualises trust as “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” (Swan *et al.*, 1985, p. 203). This definition is borrowed from the influential American psychologist Julian B. Rotter (1916-2014) who is famous for introducing the cognitive trait “locus of control” and for his role in the development of the social learning theory. Rotter is the 64th most cited psychologist from the twentieth century (Haggbloom *et al.*, 2002) and his work on trust (Rotter, 1967, 1971, 1980) is heavily cited by marketing scholars. The work of Rotter still influences, directly or indirectly, the work of current scholars on trust within the industrial marketing domain.

The cognitive psychological perspective on trust, as brought forward by Rotter and as adopted by many scholars within the industrial marketing domain, considers trust as a necessary instrument for efficient adjustment and even survival of human beings within a social context (Rotter, 1967). Rotter considers trust as a cognitive choice to rely on the other. This choice is determined by (generalised) expectancies that trusting the other will lead to some kind of reinforcement. In order to measure interpersonal trust, Rotter developed a scale based on a Likert format which enabled scholars from many different academic disciplines to include a trust variable in their models and to make distinctions between high and low trust individuals (Rotter, 1967). For example, the Rotter scale was one of the inspirational sources for the scale to measure perceived trust in B2B sales by Plank *et al.* (1999).

According to the cognitive psychological perspective, trust is about believing others to be reliable, which is clearly visible in the definition of Swan *et al.* (1985) at the beginning of this section. Individuals differ in the ease at which they believe in the reliability of the other. High trust individuals are less likely to lie or cheat, are more likely to give others a second chance and are also less likely to be unhappy, conflicted or maladjusted (Rotter, 1980).

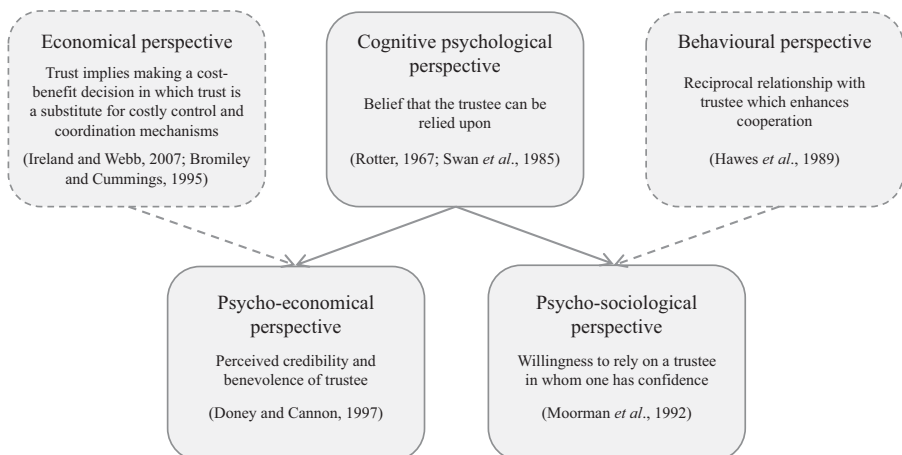
Believing others to be reliable automatically implies being vulnerable. This makes the decision to trust a risky decision. Based on this accentuation on vulnerability, risk and possible reward, a psycho-economical perspective on trust emerged in which trust is mostly defined as “the perceived credibility and benevolence of a target of trust” (Doney and Cannon, 1997, p. 36). This definition recognises, with respect to the concept of trust, two dimensions: credibility or the expectancy that you can rely on the other, and benevolence, which means that if you trust somebody you believe that the other has a desire to do good and is therefore motivated to seek joint gain. These two dimensions of trust are also recognised and accepted in other literature (Dimoka, 2010). Of all the articles recently published on trust in a context of relationship marketing within *IMM*, *JBIM* or *JBBM* (2012-2015), 42 per cent are directly referring to the work of Doney and Cannon (see in Appendix). In other words, the psycho-economical perspective still has a dominant footprint on the B2B marketing literature on trust. A full economic perspective on trust, which is next to the cognitive psychological perspective the other pillar of the psycho-economical perspective, is hardly found within the B2B marketing literature. For example, the perspective from transaction cost economics, where trust is seen as a substitute for costly control and coordination mechanisms (Ireland and Webb, 2007; Bromiley and Cummings, 1995), does not make the foundation of defining trust by industrial marketing scholars.

Besides the development of the cognitive psychological perspective into the psycho-economic perspective, the cognitive psychological perspective also evolved into a psycho-sociological perspective in which trust is seen as “a willingness to rely on an exchange partner in whom one has confidence” (Moorman *et al.*, 1992, p. 315). Within this psycho-sociological perspective, trust has two dimensions: a psychological dimension in which trust is seen as a belief (i.e. confidence) and a sociological dimension where trust involves a behavioural intention or actual behaviour (i.e. willingness to rely on the other) (Moorman *et al.*, 1993). Psycho-sociological definitions are

considered to be very well suitable when an individual-organisational level of analysis is applied, since the individual belief is combined with experiences and behavioural intentions that individuals have with respect to an organisation (Money *et al.*, 2012). From the exploratory bibliometric research (see Appendix 1), it is visible that the psycho-sociological perspective that Moorman, Zaltman and Deshpandé brought forward is still valued and used by the current B2B scholars on trust: over a quarter of the articles on trust published in *IMM*, *JBIM* and *JBBM* in the period 2012-2015 refer to their work.

There is only a subtle difference between the psycho-economical and the psycho-sociological perspective: the economical approach is focussing more on the question whether or not the other party will act in your benefit while the sociological approach is more concentrated around a person's attitude and behaviour towards one or more to be trusted others. This difference can best be seen by comparing the term credibility of Doney and Cannon (1997), i.e. expectancy that one can rely on the other, to the definition of Moorman *et al.* (1992), i.e. willingness to rely on the other. So, the psycho-economical approach is relatively more about the impression on how the potentially trusted person is behaving towards you, and the psycho-sociological approach is more about your behaviour towards a potentially trusted party. Both the psycho-economical and the psycho-sociological perspectives on trust contain two components. This makes the measurement of trust difficult: is it best to measure trust as an overall concept or do you focus at its underlying components, in which case one can place question marks regarding the extent at which those components are intertwined (Geyskens *et al.*, 1998)?

The sociological dimension in the psycho-sociological perspective is derived from a behavioural perspective on trust (see Figure 2). Within the behavioural perspective, trust is seen as a reciprocal relationship which facilitates cooperation (Hawes *et al.*, 1989). For example Currall and Judge (1995) define trust as “an individual's behavioural reliance on another person under a condition of risk” (p. 153) and identify dimensions of trusting behaviour: open and honest communication with the counterpart, entering an informal agreement with the counterpart, maintaining surveillance over the counterpart and task coordination with the counterpart. Despite the fact that the behavioural perspective on trust, with its focus on cooperative collaboration, seems to fit the industrial marketing domain the best, it is not the dominant perspective taken by scholars in the field. In general the perspectives which have their roots in cognitive psychology dominate the B2B marketing literature on trust. “In fact, as in other areas of marketing research, trust is dominated by cognitivist approaches. Indeed, many approaches are based on knowledge and mechanisms



**Figure 2.**  
The “trust box”:  
different perspectives  
on trust within the  
industrial marketing  
domain

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of information processing from beliefs and perceptions. Although the impact of affective states is recognized as essential for understanding trust, especially in interpersonal contexts, little interest has been shown in such states in the conceptualization and measurement of this construct” (Akrouit and Akrouit, 2011, p. 3).

Within the late 1990s and the beginning of this millennium, the cognitive approaches on trust were subject to criticism (Andersen and Kumar, 2006; Rousseau *et al.*, 1998). It became slowly accepted that a division could and should be made between cognitive and affective trust (for an excellent elaboration on the difference between cognitive and affective elements of trust see Dowell *et al.* (2015)). But scholars are having problems with the measurement of these different elements, and there are only a few articles that take into account affective trust, but mostly in a conceptual or qualitative manner (Dowell *et al.*, 2015; Young and Daniel, 2003).

### *Trust development*

“Trust is built over time and starts with a low-risk commitment” (Swan *et al.*, 1985, p. 204). In general, the development of trust is considered as being a time-consuming and labour-intensive process (Hawes, 1994). B2B marketing scholars, who are heavily influenced by the psychological domain, focus on the essential personal attributes of the salesperson and on how the salesperson can influence trust development. To gain the trust of the buyer, the salesperson should behave as a dependable, honest and competent person, must be a master in impression management, exhibit an altruistic motivation of customer orientation and be likable (Swan *et al.*, 1985; Hawes, 1994). This focus on personal attributes suggests that the performance of the salesperson is ultimately a function of his personality traits (Dion *et al.*, 1995).

Later on, the psychological influences on the marketing literature on trust mixed with influences from the field of economics. The work of Doney and Cannon (1997) became the most important piece with respect to trust development. They identified five distinct processes by which trust can develop in business relationships: a calculative process (a cost-benefit analysis of trusting the other), a prediction process (forecasting the behaviour of the other), a capability process (determining the others’ credibility), an intentionality process (determining the others’ intentions) and a transference process (the transference of trust from one party to the other). These processes are all cognitive processes and are, according to Doney and Cannon, applicable to both trust and distrust.

Current work on trust development in a B2B marketing context has highlighted the role of some antecedents of trust, such as intercultural competences (Elo *et al.*, 2015) and interpersonal liking (Abosag and Naudé, 2014), and on the power-trust relationship (Jain *et al.*, 2014; Cuevas *et al.*, 2015). However, scholars on trust nowadays place more emphasis on the role of trust with respect to different output variables.

### *The role of trust*

Current work on trust in a B2B marketing context predominantly studies trust in relation to other variables. The role of trust has for example been brought in relation to the birth and continuation of business relationships (Mandják *et al.*, 2015; Cuevas *et al.*, 2015; Valtakoski, 2015; Jack and Powers, 2015; Munksgaard *et al.*, 2015; Ekici, 2013; Kusari *et al.*, 2013), the performance of alliances and collaboration networks (Jiang *et al.*, 2015; Jain *et al.*, 2014; Filieri *et al.*, 2014; Jiang, Li, Gao, Bao and Jiang, 2013; Zhang and Zhou, 2013), export market orientation (Chang and Fang, 2015), the adoption of disruptive technology (Obal, 2013) and of course to satisfaction, commitment and loyalty (Yang, 2015; Graca *et al.*, 2015; Abu Saleh *et al.*, 2014; Human and Naudé, 2014).

Trust is considered to be the key mediating variable between characteristics of the trustee and output variables as commitment and loyalty. The intertwined relationship

between trust and commitment has been specifically brought forward by Morgan and Hunt (1994), which is the most cited article by current B2B marketing scholars studying trust (see Appendix 1). Where trust is more seen as an attitude, commitment is the motivation or behavioural intention that follows from that attitude. Just like trust, commitment encompasses an affective component, which reflects the general positive feeling from the buyer, and a calculative component, reflecting the degree of difficulty in replacing the supplier (Kumar *et al.*, 1994; Jain *et al.*, 2014). From commitment it is an easy step towards satisfaction and loyalty, where loyalty is considered as having multiple dimensions such as repurchase intention, or positive word of mouth (Harris and Goode, 2004; Vlachos *et al.*, 2009). The concepts of trust, commitment and loyalty can be considered as the “Three Musketeers” of relationship marketing.

### Neuroscientific perspective on trust

With the research focus of industrial marketers on the role of trust in relation to different output variables, examinations of the nature and development of trust are tasting defeat. Despite the enormous amount of research on the concept of trust, trust is often ill defined (Akrouf and Akrouf, 2011; Jiang, Shiu, Henneberg and Naude, 2013). As addressed in the previous section, industrial marketing scholars are wrestling with the different elements in which trust can assumedly be decomposed. In this section, it is investigated how a neuroscientific perspective can shine a new light on this deadlock. A neuroscientific perspective on the nature of trust, the trust-building processes and the mediating role of trust is described below (see Appendix 2 for a glossary containing the neuroscientific terms used in the text below).

#### *The nature of trust (and distrust)*

Within the brain, trust is associated with higher activation in the caudate nucleus (associated with the anticipation on positive rewards), the putamen (associated with the prediction of rewards) and the anterior paracingulate cortex (PCC) (associated with predicting behaviours of others: “mentalizing”), and with lower activation in the orbitofrontal cortex (associated with calculating uncertainty) (Dimoka, 2010). Dimoka (2010) tested the dimensions of trust as distinguished by Doney and Cannon (1997), i.e. credibility and benevolence, and found that they cannot completely be separated, since in the brain they both involve the same areas (caudate nucleus and putamen: areas associated with a sense of reward). By the research of Dimoka (2010), it can be roughly stated that credibility and discredibility involve the more cognitive domains in the brain (prefrontal cortex) and that benevolence and malevolence the more emotional domains (limbic system). So when looking at the neural correlates of trust, it is reconfirmed that the overall concept of trust entails both a cognitive and an affective component, but also that these components are very much intertwined.

The trust literature within the field of industrial marketing focusses on the concept of trust and not at its counter ego distrust. That is probably because distrust is often seen as the reverse of trust. Although trust and distrust are verbally just two opposite words on the same spectrum, neuroscience has shown that the concepts of trust and distrust actually involve distinct areas within the brain. In the brain, distrust is associated with a higher activation of the insula (associated with a fear of loss) and the amygdala (associated with the processing of intense emotions and socially relevant information) (Winston *et al.*, 2002; Dimoka, 2010). Distrust is “a belief that a partner will be incompetent, exhibit irresponsible behaviour, violate obligations, and will not care about one’s welfare or even intend to act harmfully. [...] Distrust is not just the absence of trust, but the active expectation that the other party will behave in a way that violates one’s welfare and security” (Cho, 2006, p. 26). Thus, where trust is associated with a feeling of safety and reward, a state of distrust is a



mental warning signal to keep away: “distrust denotes a perception of vulnerability due either to fear of the other’s motives, intentions, and prospective actions, or to vague forebodings that things are not as they appear and something unpredictable may occur” (Schul *et al.*, 2008, p. 1293). Therefore, distrust will lead someone to reject an offer, but probably a distrusted supplier will not even make it to the stage of making proposals. Seeing distrust not as a low level of trust, but as another construct, results in remarkable findings. For example, competence of the trustee does not increase trust, but in fact decreases distrust (Cho, 2006), and distrust is likely to have a greater effect on price premiums than trust (Dimoka, 2010).

The neural difference between trust and distrust is, in a complete different context, also seen in a neural representation of the prospect theory (Kahneman and Tversky, 1979). When framed as profits (resulting in risk-avoidant behaviour) the older ventromedial system in the brain gets active, where for losses (resulting in risk-seeking behaviour), the neocortical dorsomedial system is activated which is the more “calculational part of the brain” (Smith *et al.*, 2002, p. 717). Therefore, risk-avoidant behaviour is probably more natural or instinctive choice behaviour, while risk seeking has a more calculative character (Smidts, 2002). A likewise distinction can also be seen for the concepts of trust (i.e. risk-seeking behaviour) and distrust (i.e. risk-avoidant behaviour).

From a neurobiological perspective, it is shown that hormones, of which people are mostly unaware of the effect they have on their behaviour, are influencing trust. For example, the hormone oxytocin increases trust and testosterone decreases trust. Oxytocin is a neuropeptide (i.e. a neuronal messenger in the brain) that is strongly associated with social attachment and has a positive effect on interpersonal trust (Kosfeld *et al.*, 2005; Merolla *et al.*, 2013). “Oxytocin specifically affects an individual’s willingness to accept social risks arising through interpersonal interactions” (Kosfeld *et al.*, 2005, p. 673), and therefore, the intranasal administration of oxytocin enhances trust and increases the bids investors make in a financial trust game. When experiences learn that trust is betrayed, it is shown that subjects with increased oxytocin levels (due to a nasal spray) do not adjust their trust perception of the other, while subjects without increased oxytocin levels do decrease their trust perception (Baumgartner *et al.*, 2008). It might even be the case that cultural differences in trust are related to variations in the intake of oxytocin due to biological, social and environmental factors: “nations that have higher incomes, cleaner environments, and that consume more food containing phytoestrogens appear to have higher levels of generalized trust” (Zak and Fakhar, 2006, p. 424). Whereas the hormone oxytocin increases trust, the hormone testosterone decreases trust (Boksem *et al.*, 2013). This is probably due to the competitive and perhaps antisocial behaviour that testosterone is causing.

So a neuroscientific perspective shows that the nature of trust and distrust differ. Whereas trust is associated with a sense of reward, distrust is associated with a sense of fear and being unsafe. It is likely that one automatically makes the evaluation whether or not to distrust the other, and that the decision to trust takes longer and is more calculative by nature. Furthermore, credibility and benevolence, as identified by Doney and Cannon (1997), are difficult to completely distinguish but credibility might be more cognitive by nature and benevolence more emotional. Finally, people might differ in the ease of trusting others because they differ in their levels of oxytocin.

### *Trust-building processes*

Recently, there has been a paradigm shift in the psychology of reasoning (Elqayam and Over, 2012). Whereas traditionally reasoning is seen as a cognitive and calculative process, since the last few decades, the dual processing theory has been gaining influence (Evans, 2008). The dual processing theory suggests two processes: a fast and automatic process (which Kahneman (2011) labels “System 1”) and a slow cognitive process (“System 2”). These two

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processes can be explained from the development of the brain from an evolutionary perspective. System 1 relates to the older parts of the brain (the instinctive reptilian brain and the emotional mammalian brain) and System 2 relates to the thinking brain, the neocortex (MacLean, 1990). The trust-building processes used in B2B marketing literature, such as described by Doney and Cannon (1997), can be well understood from the traditional perspective on reasoning. But following the dual processing perspective, these trust-building processes are probably preceded by automatic and instinctive processes.

Neuroscientists have shown that just 100 milliseconds are sufficient to create a first impression of someone's trustworthiness and that additional time only increases confidence in the judgments made (Willis and Todorov, 2006). This quick, or instinctive, impression of another person's trustworthiness makes sense from the above-described evolutionary perspective; a rapid trustworthiness evaluation is crucial for modulating behaviour towards strangers (Bzdok *et al.*, 2011). From an evolutionary perspective, it is in our benefit to quickly form an impression whether or not to distrust the other, since the other might do harm. Therefore, this first impression whether or not to avoid the other goes automatically (Chen and Bargh, 1999; Winston *et al.*, 2002). The emotional response evolves directly after the automatic response. Most important in the emotional response is the amygdala, the most prominent part of the mammalian brain (Kalat, 2004), which is located in the forebrain and is part of the limbic system (also called the emotional system in the brain). The amygdala connects information in a quick, automatic and obligatory process creating emotional responses (Adolphs, 2002). At the point in time where the amygdala is activated, the individual is still consciously unaware of the stimulus (Adolphs, 2002), suggesting that the first responses with respect to trust stimuli (antecedents of trust and distrust) are of an instinctive nature.

To make a first impression, facial cues are extremely important. When we look at someone's face, the brain constructs a representation of what it sees in a way that specific features of the face are distilled. Perceptual processing of facial features can then be linked to the generation of judgments about the person, which in the brain involves the amygdala and other areas, like regions of the prefrontal cortex and regions of somatosensory-related cortices (Adolphs, 2002). The amygdala is significantly more activated when subjects view faces that they later rate as untrustworthy than when they view those rated as trustworthy, even when corrected for the fact that expressions of anger or sadness negatively correlate with trust, and happiness positively correlates with trust (Winston *et al.*, 2002). "It seems plausible that viewing people who look untrustworthy would produce emotional responses and changes in feeling in the perceiver, and that such feelings might be used, in part, to make social judgments" (Adolphs, 2002, p. 193). This feeling is probably reflected by activation in the insula: "One suggested role for the insula is the mapping of autonomic changes as they affect the body where such mappings form the basis of 'gut feelings' about emotive stimuli" (Winston *et al.*, 2002, p. 280). One of the facial cues people use in their trustworthiness evaluation is gender. People are influenced by a general bias to regard male faces as untrustworthy and female faces as trustworthy (Dzhelyova *et al.*, 2012).

Crucial in the making of first impressions is the amygdala. An ALE meta-analysis on fMRI studies with respect to trust and attractiveness shows that where the amygdala was first dominantly associated with the processing of negative emotional stimuli, the amygdala is actually associated with processing all socially relevant stimuli (Bzdok *et al.*, 2011). This means that activation of the amygdala does not only play a crucial role for the processing of distrust, but also for the processing of trust. In general, it can be cautiously assumed that the amygdala is the filter of information with respect to social decision making (Bzdok *et al.*, 2011).

The impressions of System 1 are picked up by System 2 (Kahneman, 2011). This might be in the form of post-rationalisations (Johansson *et al.*, 2005). For example, when System 1 tells you to distrust the other, System 2 produces argumentations for this instinct. When the

quick decision has been made that avoidance is not necessary (so that the other is not distrusted), one can start to wonder whether the other can be trusted. This is where the trust-building processes come up. Since trust involves risk-taking behaviour, one starts to make a cost-benefit analysis. Such an analysis is slow and calculative by nature. In the last section, it has been described that trust in the brain involves the brain areas that can be associated with the prediction of reward, the calculation of uncertainty and with mentalizing the other. This relates closely to the five processes identified by Doney and Cannon (1997).

In an event-related hyper-fMRI study (hyper-fMRI means that multiple subjects, each in a separate MRI scanner, can interact with one another while their brains are simultaneously scanned), Krueger *et al.* (2007) investigated the neural correlates of trust by letting two strangers interact online in a sequential reciprocal trust game. They show that the PCC is involved in building a trust relationship. The anterior PCC is activated for understanding intentions involving social interaction (Walter *et al.*, 2004). Anterior PCC activation also takes place when social interaction was foreseen but had not actually taken place, so the PCC might be involved in mentalizing future social interaction (Walter *et al.*, 2004; McCabe *et al.*, 2001). This mentalizing is unique for human beings, implying that it consists of a higher cognitive order (Krueger *et al.*, 2007).

So, the evaluation of the trustworthiness of the other involves a fast, automatic, instinctive and emotional process (which may best be summarised by “first impression processes”), in which a quick judgment is made whether or not to avoid the other, and a slow and calculative process in which an individual compares the benefits of trusting with the costs of cheating by the other. The evaluation in the first stage is mostly determined by perceptual information, such as facial cues (Yang *et al.*, 2011). In the second stage, more information is retrieved from memory and assessed (Rudoy and Paller, 2009). These two stages in evaluating someone or something are also visible when people evaluate brand extensions. Based on electroencephalographic (EEG) research, it was shown that people first make a quick similarity-based evaluation of a brand extension, which is followed by a “late” analytic and category-based evaluation (Ma *et al.*, 2014).

### *The mediating role of trust*

As argued before, conceptualizations of trust suffer from conceptual confusion (Blomqvist, 1997). It is difficult to completely grasp the full concept with all its conscious and unconscious elements. Therefore, verbal measurements of trust (i.e. by interviews and/or surveys), by which the results or answers depend on the conscious and rational part of the human brain, suffer from violations of construct validity (Boshoff, 2012). At the same time, the concepts of trust and commitment are identified to play a key mediating role between personal and organisational antecedents and economic consequences (Morgan and Hunt, 1994). Economically, it is of specific relevance to be able to measure the effect of trust on economic life, and, more specifically, its effect on the buying process. Trust in a potential business partner is in itself rather worthless if it does not lead to a purchase contract. Therefore, trust has to entail an approach-related behavioural intention to be economically worthwhile.

Within an advertising context, it has been demonstrated by an EEG study that commercials that provoke an approach motivation within the brain, as is reflected by greater left-sided frontal asymmetry on the alpha band, had a greater commercial success (Ohme *et al.*, 2010). The difference between the approach system and the avoidance system and its correlation with asymmetries in EEG activity over the frontal cortex is explained by the “Davidson model” (Davidson, 1993, 2004). The general “rule” of the Davidson model is that greater left-sided frontal asymmetry on the alpha band is associated with approach-related behaviour and greater right-sided frontal asymmetry with withdrawal- or avoidance-related behaviour.

There are multiple indications that trust can be directly related to approach-motivated behaviour (Chen and Bargh, 1999; Kosfeld *et al.*, 2005; Todorov, 2008). In a recent EEG study by Vecchiato *et al.* (2014), it was found that when the faces of politicians were evaluated as trustworthy, this evoked an approach-motivated behavioural intention in the brain, as measured by a greater left-sided asymmetry on the alpha band. It is likely that oxytocin increases approach-related behaviours while inhibiting withdrawal-related behaviours (Kemp and Guastella, 2011). This is probably because oxytocin reduces activity in the amygdala. The amygdala appears to serve as a mediator between stimuli and behaviour: “Assessing an individual’s trustworthiness might be related to a broader categorization into ‘good guy, bad guy’, guiding approach versus avoidance behaviour” (Bzdok *et al.*, 2011, p. 210).

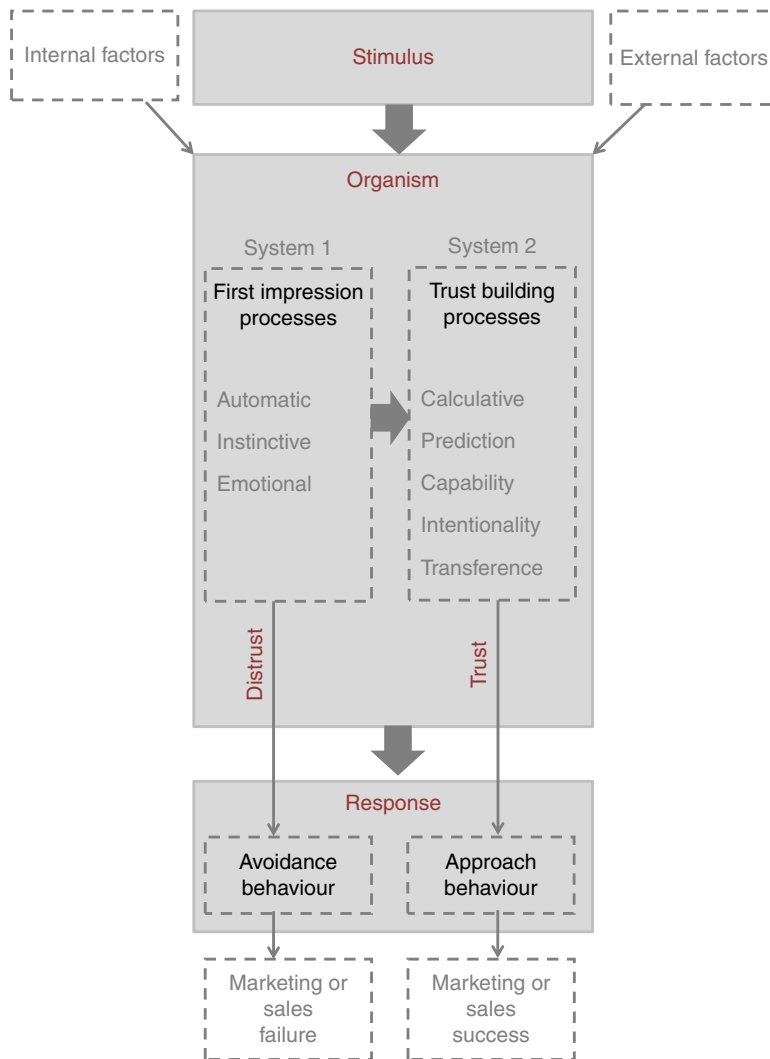
### **Towards a new conceptualisation of (dis)trust and trust building**

The neuroscientific insights presented above are conceptualised in Figure 3. The figure is based on the stimulus-organism-response model (SOR), which sprouts from the psychophysiological framework for marketing research (Wang and Minor, 2008). SOR models found their scientific entry in the 1960s in the field of consumer psychology, and were the response to the input-output models in which the consumer was seen as a rational entity and perceived as a “black box” (Jacoby, 2002). Within an SOR model, it is explicated that a stimulus creates an internal reaction within the human being, or organism. This internal reaction has psychological antecedents and physiological consequences (e.g. increased heart rate or skin conductance). The internal reaction within the organism creates a response in the form of behaviour or behavioural intention. The application of SOR models in combination with an approach- or avoidance-related behavioural intention is rare within the field of industrial marketing: it has only been applied for conceptualising the impact of a specific type of stimulus, i.e. social cues (Zeeland and Henseler, forthcoming). Here the SOR model is used with the accentuation on the organism: what happens within the individual when he/she needs to make a trustworthiness evaluation with regard to a given stimulus?

When an individual is confronted with a person or organisation and he/she needs to make a trustworthiness evaluation, System 1 will first generate a first impression. This first impression process is automatic, instinctive and emotional by nature and is led by perceptual information. Within the brain, the amygdala plays a crucial role in this process. When the person or organisation is distrusted, the amygdala creates an immediate “warning signal” to keep away (avoidance behaviour). Within a B2B context, avoidance behaviour might for example take place to protect knowledge or to avoid the waste of resources (Hoholm, 2015).

The first impressions generated by System 1 are transferred to System 2, in which a slow analytic judgment is made. This process within a marketing context is described by Doney and Cannon (1997) and split into five processes: a calculative, prediction, capability, intentionality and transference process. Neuroscientific research showed that trust indeed involves areas in the brain that are associated with the prediction of reward, the calculation of uncertainty and mentalizing (Dimoka, 2010). The development of trust is likely to create an approach-motivated behaviour or behavioural intention.

There are internal factors that are influencing the trust-building processes, such as the level of oxytocin in the body and personality traits. For example, people differ in their resting patterns of frontal EEG asymmetry, which causes individual differences in emotional responses. Persons with greater left- than right-sided asymmetry in the resting brain report higher levels of dispositional positive affect, whereas persons with greater right-sided asymmetry report higher levels of dispositional negative affect (Tomarken *et al.*, 1992). Even babies tend to cry more when separated from their mother if they have greater



**Notes:** In the figure the following elements are combined: the psychophysiology framework (stimulus-organism-response) for marketing research (Wang and Minor, 2008), the dual processing theory: Systems 1 and 2 (Kahneman, 2011), the automatic first impression processes (Willis and Todorov, 2006), the trust-building processes (Doney and Cannon, 1997), the difference between trust and distrust (Dimoka, 2010) and the avoidance- or approach-behavioural intention (Davidson, 2004)

**Figure 3.** Conceptual framework on distrust, trust and trust building based on a neuroscientific inquiry

right-sided asymmetry in the resting brain (Davidson and Fox, 1989). From this perspective, frontal EEG asymmetry might be seen as a moderator of trust (Davidson, 2004). It might also be the case that frontal EEG asymmetry is a mediator of emotion, but this is not a proven fact (Coan and Allen, 2004). This trait-like property of trust has an effect on an individual's personal and economic life. In normal environments (i.e. environments where one can depend

on routine strategies) people with a high level of trust should do better than people who distrust. But, when one cannot depend on routine strategies, individuals who distrust outperform individuals who trust (Schul *et al.*, 2008). Another internal factor influencing the evaluations being made is sleep. An experiment by Anderson and Dickinson (2010) showed that subjects that were deprived from sleep were less likely to place full trust in an anonymous partner when playing a trust game.

The external factors that are influencing the trust-building processes involve the impact of people's environment on their judgments. From the prospect theory (Kahneman and Tversky, 1979), we already know that the way a message is framed is influencing the decision people make. From an EEG study, it appears that within a trustworthiness evaluation task, subjects' brain activity differs with respect to the source from which they get their information (Boudreau *et al.*, 2009). It has also been shown that when consumers are distracted from their evaluation task, they will make a different evaluation then when they have full attention for the task (Biswas *et al.*, 2009). Furthermore, when encountering a new environment, one judges this environment based on the perception of his/her own environment (O'Brien *et al.*, 2014).

The conceptual framework presented in Figure 3 describes, with its focus on the organism, what occurs within an individual regarding distrust, trust and trust building. However, B2B relationships are often characterised as multiperson connections, both at the side of the supplying organisation as at the side of the buying organisation, in which the different entities are often experienced with each other and together create new experiences. This creates another level of complexity, lying on top of the framework presented in Figure 3. One cannot properly understand what happens within a group of individuals if one does not understand what happens within each individual of which the group is consisting. But at the same time, the group dynamics influence what happens in each individual as well (Davis, 2016; Nollet *et al.*, 2017). "Interaction processes are key to explaining how and why customer-supplier relationships emerge and develop in business-to-business markets" (Guercini *et al.*, 2015, p. 26). Current empirical research to interaction processes within B2B relationships was more focussed to organisational aspects than individual behaviour (Guercini *et al.*, 2014). But it is typically the individual behaviour of actors and the perception of that behaviour by the other that defines the success of the business relationship. Therefore, a connectionist approach is suggested to capture these dynamic elements of B2B relationships. "Connectionism is an approach in the fields of artificial intelligence, psychology, neuroscience and philosophy of mind that models mental and behavioural phenomena as the emergent processes of interconnected networks of simple units" (Van Rooy *et al.*, 2016, p. 190). It is a way of multi-actor modelling in which the individuals are not simply related to each other – mostly visualised as lines between dots – but where the group is seen as a collection of individual recurrent networks that share and create a social history together (Van Overwalle and Heylighen, 2006). In doing so, the connectionist approach is inspired on the architecture of the human brain in which each brain cell, the information-processing element of the brain, is a part of an adaptive network of cells.

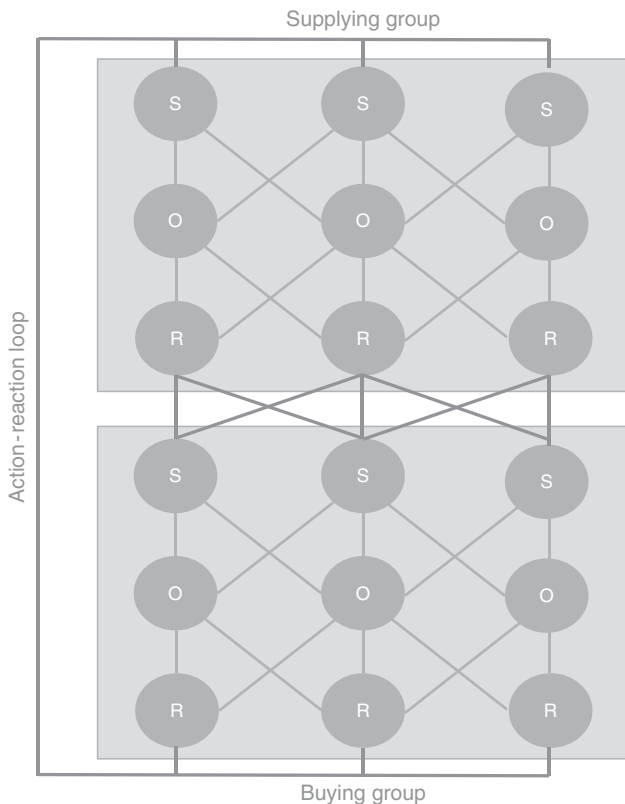
Within the connectionist approach, each individual receives a stimulus, which creates activation in the organism leading to a certain response, as visualised in Figure 3. But this is not where the process stops. Subsequently, all other individuals in the group receive the internal activation and response as a new input. The impact of this new input – considered as weights – is dependent on experience (Van Overwalle and Heylighen, 2006). As a consequence, an adaptive network emerges that is consisting of different individual networks in which information and knowledge are distributed among the actors. The advantage of using a connectionist approach is that it allows implicit, automatic and lower levels of mental processing to be of influence, which – in combination with the dynamic nature of the model – makes it a more realistic approach in describing actual interpersonal connections and

behaviours (Van Overwalle and Heylighen, 2006; Van Overwalle and Labiouse, 2004). A connectionist approach to an SOR model makes the serial model a parallel network model, as visualised in Figure 4, which fits the interactive multiperson nature of B2B relationships (Tryon and Misurell, 2008). This interaction process is an ongoing process of action and reaction (Guercini *et al.*, 2014) in which information is processed and shared with others, but also in which attitudes and feelings are transferred (as for example described by the transference process by Doney and Cannon, 1997).

### Discussion

The field of neuroscience produces new insights every day. As Barack Obama (2013) said on the BRAIN Initiative: “Now, as humans, we can identify galaxies light years away. We can study particles smaller than an atom, but we still haven’t unlocked the mystery of the three pounds of matter that sits between our ears”. This paper showed that insights from neuroscience could enrich and broaden the existing industrial marketing literature. Every day the field of neuroscience is working on revealing the mystery of the brain, making new insights available that could be useful for the marketing science.

Neuroscientific research techniques are more and more used within the B2C marketing domain because they promise to “shift the theoretical tools of consumer behaviour analysis from cognitive concepts such as attitudes, information storage and retrieval theories to the mechanisms of sensory depiction of ‘reality’ and its experience” (Achrol and Kotler, 2012, p. 37). Industrial buying behaviour differs from consumer buyer behaviour in many ways,



**Figure 4.**  
A connectionist approach to the SOR framework presented in Figure 3

as discussed in the first section. However, since business relationships and networks are considered by the IMP Group to be characterised by interpersonal interaction and since the quality of this interpersonal interaction depends on a personal click and mutual familiarity between the actors, there must be a role of influence for emotion and unconscious processes (Makkonen *et al.*, 2012; Lynch and Chernatony, 2007; Wilson, 2000). Therefore, neuroscientific research techniques should become part of the “standard” equipment of B2B marketers, just as it is becoming for the B2C marketers, which would enable the field to study the neuroscientific foundations of choice behaviour within the context of industrial marketing (Hinterhuber, 2015).

The conceptual framework presented in Figure 3 enables scholars within the field of industrial marketing with an enriched and broadened perspective on the role of trust which may guide future research in different ways. At the conceptual level, the construct validity can be improved by measuring the full scope of the concept of trust, i.e. both the affective and cognitive component and the two stages of processing. When trust and distrust are seen as different concepts, the economic consequences of trust and distrust can be measured separately. The determinants of trust in a business context are rather well examined, but there is a lack of research on the determinants of distrust, and studies in that direction could help industries to avert distrust. Interestingly, it is very well possible that the concepts of trust and distrust differ, in a way that they are not just two opposites at the same continuum, but that their behavioural consequences are two ends at the same construct (i.e. approach vs avoidance). This does not hold for every construct though. For example, trust may lead to loyalty, but distrust might not lead to disloyalty. The ways in which a neuroscientific perspective might specifically shape the future research agenda are presented in the next section.

Trust and its consequence commitment both have no economic value in itself. The economic value lies in what results from that trust and commitment. Therefore, the presented conceptualisation suggests “approach-motivated behaviour” as mediating variable since it evolves a perspective on attitude-level towards a perspective on the level of behavioural intention, which is related more closely to having true economic value.

The presented conceptual framework is a general framework; it is in essence applicable in both a B2B and a B2C context. That is because what happens within a human being, which is the focus of the framework, will probably not be totally different when the person is buying in the role of a professional buyer as when he is buying as a private consumer. However, B2B relationships differ from B2C relationships. In B2B relationships, there are often multiple persons involved, creating a dynamic atmosphere in which trust-transference processes are operative (Doney and Cannon, 1997). To capture this dynamic atmosphere, a connectionist approach is suggested as a layer on top of the conceptual framework. Connectionist approaches have been used more often when dealing with marketing topics, for example with respect to brand-quality associations (Janiszewski and Van Osselaer, 2000), decision making (Roe *et al.*, 2001) and consumer attitudes (Thiel and Demontrond, 1997). Connectionist approaches are specifically useful when one wants to capture learning effects, such as the learning from previous experiences within a business network. Under the incitement of the IMP group, the network approach – in which businesses are considered as part of a web instead of part of a chain – gained influence (Håkansson and Snehota, 2006). Connectionist modelling is based on the same network approach, with the difference that with connectionist modelling each actor in the network is considered to form its own recurrent network. In other words, an individual is not just a node in a web, but an information-processing network within a web of networks. This has the advantage that it allows for exploring individual behaviours within the context of the bigger picture, while the results allow to examine this bigger picture (Rand and Rust, 2011). Of course, this advantage comes with disadvantages. These disadvantages include the necessary advanced mathematical techniques and the assumed only causal connectedness (Fodor and Pylyshyn, 1988).



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At the methodological level, this paper might create an urge for adopting new research techniques. Regarding buyers as human beings that are bounded rational implicates to see them as persons making judgments based not only on factors of which they are aware, but also of which they are unaware. The SOR model helps to analyse industrial buyer decision behaviour with all the conscious and unconscious processes that guide or influence that behaviour. The SOR model forms an excellent framework for psychophysiological research in the marketing domain, but it requires new research skills. Therefore, the main discussion question is whether the benefits of adopting a neuroscientific perspective on trust within a business context outweigh the costs of acquiring new skills and adopting insights from a discipline that is so far alienated from ours. To the opinion of the authors they do, but it requires a huge investment, both in time and money. For a discipline studying collaborations so much, it might be a good time to collaborate itself with a discipline that is capable of enriching the current research practice so that we get a more complete picture of the factors of success and failure of buyer-seller relationships and collaborations in business life.

### Conclusion and research agenda

Industrial marketing scholars studying trust have been inspired by the academic disciplines of business, management, economics, psychology and sociology, and in doing so have exhibited a cognitive approach on the concept of trust. They use, to a great extent and for a good reason, the same strong shoulders on which they lean in many directions and positions. In this paper, these shoulders (e.g. Rotter, Morgan and Hunt, Doney and Cannon) have been presented. It could be argued that industrial marketing scholars regarding the concept of trust tend to think within a big box, and that this box is black. In other words, most studies on trust are based on the same, cognitive way of reasoning, in which the processes that occur within the human individual are being ignored or under-investigated. That is not necessarily problematic, but by thinking outside the box new thoughts on trust might arise.

By introducing a neuroscientific perspective, it was shown that there is a reason to doubt the perception that trust and distrust are opposite poles on the same axis. Since distrust is currently under-investigated, this might create an urge for further inquiries into the nature and development of distrust within a B2B context. By studying the neural correlates of both trust and distrust, more becomes clear about the nature of these constructs. For example, the neural correlates of trust show that trust is associated with the prediction of and anticipation on rewards, with a state of mentalizing and with calculating uncertainty. When taking a neurobiological perspective, it was displayed that the hormones oxytocin and testosterone are of considerable influence, and that they have a respectively positive and negative effect on trust. Variations in the intake of oxytocin might even create individual and cultural differences in trust. The presented conceptual framework based on a neuroscientific perspective relates distrust to avoidance behaviour and trust to approach behaviour. Approach and avoidance can be measured by frontal EEG asymmetry. Furthermore, it shows that distrust is often quickly developed by automatic, instinctive and emotional processes, whereas the development of trust also includes a more calculative process.

The exhibited neuroscientific perspective on trust might shape the future research agenda in many ways. First, to fully grasp the nature of both trust and distrust, the neural correlates of these constructs should be investigated within a B2B context. The current knowledge on the neural correlates of trust is established by letting subjects play (trust) games. A reproduction of the hyper-fMRI study of Krueger *et al.* (2007) within an actual business setting would be worthwhile, since then we would be able to capture the mutual neural response of different negotiators to each other at the same moment of time. Since B2B marketing, especially under the wings of the IMP group, is intensively studying business

interaction, neuroscientific research that can register what happens within individuals during that interaction has the most potential. In other words, hyperscanning – neuroscientific research on multiple subjects at the same time – could help to pave some unpaved roads (see Babiloni and Astolfi (2014) for an overview on hyperscanning techniques and methods). Once we have the neural coordinates of the action-reaction loop that characterises B2B relationships, we can further open “the black box of interaction” (Guercini *et al.*, 2014, p. 935) and systematically analyse the relevant factors of influence in order to make suggestions on how B2B relationship building could be improved. Close to the nature of trust and distrust, a research opportunity lies in the investigation of antecedents of both trust and distrust, and if these antecedents are different. For example Lee *et al.* (2007) bring up some interesting research questions with respect to the nature of trust that could typically be investigated with the use of neuroscientific techniques and that are still not properly answered: “is trust a simple response to a repeated positive stimulus, or something more?”, “is the trust a buyer says they have in a seller, or a consumer in a product claim, similar in terms of the nature and location of brain activity to the trust that individual says they have in a close friend or family member?”, “for example, does trust in an advertising claim or new business partner require increased information processing effort and time than trust in a long-term friend?”, “is consumer trust in claims relating to a product similar to a purchasing agent’s trust in a contract with a supplier, and in turn is this of the same nature as the purchasing agent’s trust in the individual sales executive they have negotiated with?”, “can trust be transferred from an organisation to a representative of that organisation?”, “does trust evolve throughout the course of an inter-organisational relationship, or with continuing loyalty of a consumer to a single brand?”, and “is trust ever truly existent in short-term marketing relationships?” (pp. 201-202).

Second, this paper has created research challenges and opportunities with respect to the measurement of both trust and distrust. Since these constructs both have a cognitive and affective component, and since we are partly unaware of the manifestation of these components, applying neuroscientific research techniques (such as EEG or fMRI) is of added value. It should also be investigated if there are “easier ways to Rome”, for example by integrating BIS/BAS scales as a proxy for approach vs avoidance behaviour (Carver and White, 1994).

Third, with respect to distrust development, there is an open meadow full of research opportunities. Distrust is often a quick and automatic response to a certain stimulus, but it is very well possible that an initial low trust level transforms into distrust. In that case, what are the trigger points that cause a low level of trust to evolve in distrust? The same open meadow of research opportunities exists for the consequences of distrust. Can the construct of distrust help to explain the high rate of fiascos with respect to the introduction of innovations? Can it help explaining the failure of forming strategic alliances? And how can such failures be overcome? What is the effect on price premiums within a B2B context?

A fourth research opportunity lies in the examination of personal differences with respect to trust and distrust. What is the importance of “the right men at the table”? Are strategic alliances often the outcome of a group of people that by nature trust others sooner? What happens to a group when somebody joins that has trust difficulties, for example because of a high level of testosterone? Can somebody, by neurofeedback, be trained to exhibit behaviours that cause others to have more trust in him/her? What is the role of sleep? If sleep deprivation makes us less likely to place full trust in the other (Anderson and Dickinson, 2010), what happens if negotiations take place until deep in the night? And what is the role of gender? There are indications that females are more quickly considered as trustworthy (Dzhelyova *et al.*, 2012) and, from a neurobiological perspective, it might be that females place more trust in others. When more females are at the negotiation table, does this lead to more collaborations? In general, the role of hormones at the negotiation table is worth a thorough investigation.

And fifth, since there is reason to assume that there are cultural differences in the “ground level” of trust based on differences in the intake of oxytocin, what is the effect on patterns of trade and the forming of international alliances? Does the intake of the “trust hormone” oxytocin lead to more collaborations or does it accelerate the process of relationship building?

Finally, this paper has provided a starting point for conceptualising distrust, trust and trust building by integrating a neuroscientific perspective. Now might be a good time to test this conceptual framework within a B2B context and to improve it. Furthermore, the foundation of the presented conceptual framework itself, the SOR model, invites for an exploration with respect to other constructs besides trust as well. In the end, conceptualisations based on SOR models transform the black box approach into investigations of the grey matter.

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- Zhang, Q. and Zhou, K.Z. (2013), "Governing interfirm knowledge transfer in the Chinese market: the interplay of formal and informal mechanisms", *Industrial Marketing Management*, Vol. 42 No. 5, pp. 783-791.

### Appendix 1. Exploratory bibliometric research on trust

A neuroscientific perspective on trust within the context of industrial marketing is extremely rare. To flesh out this statement, an bibliometric research has been conducted among 69 articles on trust published in *Industrial Marketing Management (IMM)*, *Journal of Business and Industrial Marketing (JBIM)* and *Journal of Business-to-Business Marketing (JBBM)* within the period 2012-2015. The time period 2012-2015 is relatively small; therefore, the results can only be seen as exploratory. At the same time, introducing neuroscience in the marketing domain is a very recent development, and if neuroscientific work would have been used by industrial marketing scholars, that would have been done the last couple of years. The results show that indeed the neuroscientific perspective did not find its way into the industrial marketing domain, considering the concept of trust.

### **Bibliometrics and interdisciplinarity**

Analysing the citing behaviour of authors belongs to the discipline of social epistemology in which the utilisation of intellectual products is studied (Shera, 1972). Citation analysis assumes that citations have symbolic value and are products of social behaviour (Small, 1978). Bibliometric research in the past has revealed some interesting citing behaviours. For example, there appears to be two prototypical structures of citation behaviour: scholars in the natural sciences tend to focus on recently published research while ignoring foundational work, whereas scholars in the behavioural sciences show opposite behaviour by focussing on foundational work, while ignoring recent publications (Hargens, 2000). There has also been found two prototypical structures of self-citation behaviour: top-performance research groups tend to have less self-citations because authors from other research groups will cite them anyway and lower-performance research groups need more self-citations as a way of promoting their own work (Raaijmakers, 2008).

Eugene Garfield is the “godfather” of bibliometrics and his work caused the real breakthrough of the field (Andrés, 2009). He developed the Science Citation Index, an interdisciplinary database in which journals and articles from various disciplines are integrated. Especially the interdisciplinary characteristic of his index was innovative; prior indices were discipline oriented (Andrés, 2009). Nowadays scholars have all the means to take an interdisciplinary approach in their research, but do they?

“Interdisciplinarity occurs when knowledge, experience, technology or expertise is transferred among the worlds via borrowing, collaboration and/or boundary crossing” (Steele and Stier, 2000, p. 477). Rafols and Meyer (2010) present two approaches to investigate interdisciplinarity by using bibliometrics. The first approach is a top-down approach in which references are categorised by predefined categories to study their proportions and/or relations. This approach is measuring the disciplinary diversity by using citation analysis. The second approach is a bottom-up approach in which references are clustered and mapped to study the similarity at the network level, also called network coherence. The bottom-up approach often uses co-citation analysis or bibliographic coupling. Both approaches have disadvantages. The top-down approach is using predefined categories, “which may miss emergent or dynamic phenomena in science” (Rafols and Meyer, 2010, p. 269). On the other hand, the bottom-up approach is only feasible for investigations at the micro or meso level. The combination of the two approaches would give the most nuanced view, whenever that nuance is necessary. For example, Backhaus *et al.* (2011) performed both a top-down (citation analysis) and a bottom-up (co-citation analysis) approach to investigate the structure and evolution of business-to-business marketing; a research question that clearly asked for nuance. With respect to the level of interdisciplinarity in bibliographies in B2B journals, their research showed that journals from the discipline of psychology have minor impacts on B2B research. However, mostly only a top-down approach is used. Examples are the research of Hurd (1992) which showed that over 49 per cent of the journals cited by scientists in a chemistry department of a university were classed in other disciplines and the study of Choi (1988) in which even 70 per cent of the literature cited in anthropology journals were classed in other disciplines. The field of anthropology could therefore be seen as a “receiving” discipline.

### **Methodology**

An exploratory bibliometric research is performed to reveal the shoulders on which the current industrial marketing scientific community stands when discussing trust and to assess whether there are some neuroscientific shoulders. To identify the intellectual structure of this research field, a citation analysis is performed (top-down approach) in which the distribution of references among categories (i.e. different disciplines) is measured. Studies of interdisciplinary research, by using citation analysis, mostly used measures like “citations outside category (COC)” (Chubin *et al.*, 1984), by which a lot of data gets lost: COC measures label references only as within or without a category, and are therefore not a good measure of broad diversity (Steele and Stier, 2000). It is better to focus at the distribution of references among categories, which is done in this exploratory investigation.

The SCOPUS database presents 76 articles on trust from the three leading B2B journals (*JMM*, *JBIM* and *JBBM*) in the period 2012-2015. These 76 articles all have “trust” in their title, abstract

or keywords, and represent 31 per cent of all the articles ever published on “trust” in *IMM*, *JBIM* and *JBBM* (245 articles). Of these 76 articles, the articles are selected that are directly related to the broad field of relational marketing. At the end of this appendix the articles that are included (69 articles) and excluded (7 articles) in the exploratory research are shown. The 69 articles included in the bibliometrical research have 5,288 references (websites and references to dictionaries or statistical yearbooks excluded), which gives an average of 76.6 references per article. The 5,288 references are spread out over 3,593 different sources and are categorised over disciplines using the Social Sciences Citation Index (SSCI).

**Results**

Table AI shows that the commitment-trust theory of Morgan and Hunt (1994) forms, with 48 citations, the most popular source. This is a predictable outcome, since the work of Morgan and Hunt is in the complete industrial marketing field, one of the most important sources (Backhaus *et al.*, 2011). Table AI shows the other dominant work directly on trust as well, i.e. Doney and Cannon (1997), and two dominant works on the context in which trust is studied: relationship marketing, i.e. Dwyer *et al.* (1987) and Ganesan (1994). The top ten references show roughly three categories, which can also be identified among the other 5,278 references: articles on trust, articles on the broader topic of relationship marketing and methodological articles. The only two articles in the top ten list that are published in a journal from the psychology domain are both methodological by nature. The youngest article from this top ten list is Podsakoff *et al.* (2003). The average age of the most popular ten references is almost 25 years. This is in line with the finding of Hargens (2000) that within the behavioural sciences, scholars tend to focus on classic works instead of recent publications.

From the 5,288 references, there are 839 citations to a work that has “trust” or a derivative of the term trust in the title. These 839 are spread over 379 different works, of which the top ten is shown in Table AII. In the top ten list, the article of Bradach and Eccles is the only one from another discipline.

The two most important journals referred are the *Journal of Marketing* and *IMM*, as is shown in Table AIII. Almost 20 per cent of all the references have these journals as their source. So one could say that if a scholars’ literature review on the topic of trust is represented by one hand, than one finger is always pointing towards the *Journal of Marketing* or *IMM*. The top ten journals together account for more than 40 per cent of all the references in the bibliometric data set. Remarkable is that all the journals mostly referred are having their roots within the domains of business and management (according to the SSCI). In the top 25, there are only two journals from another domain than business

Morgan, R.M. and Hunt, S.D. (1994), “The commitment-trust theory of relationship marketing”, <i>Journal of Marketing</i>	48
Dwyer, F.R., Schurr, P.H. and Oh, S. (1987), “Developing buyer-seller relationships”, <i>Journal of Marketing</i>	31
Doney, P.M. and Cannon, J.P. (1997), “An examination of the nature of trust in buyer-seller relationships”, <i>Journal of Marketing</i>	29
Ganesan, S. (1994), “Determinants of long-term orientation in buyer-seller relationships”, <i>Journal of Marketing</i>	29
Anderson, J.C. and Narus, J.A. (1990), “A model of distributor firm and manufacturer firm working partnerships”, <i>Journal of Marketing</i>	25
Fornell, C. and Larcker, D.F. (1981), “Evaluating structural equation models with unobservable variables and measurement error: algebra and statistics”, <i>Journal of Marketing Research</i>	23
Anderson, J.C. and Gerbing, D.W. (1988), “Structural equation modeling in practice: a review and recommended two-step approach”, <i>Psychological Bulletin</i>	20
Anderson, E. and Weitz, B. (1992), “The use of pledges to build and sustain commitment in distribution channels”, <i>Journal of Marketing Research</i>	20
Moorman, C., Zaltman, G. and Deshpande, R. (1992), “Relationships between providers and users of market research: the dynamics of trust within and between organizations”, <i>Journal of Marketing Research</i>	19
Podsakoff, P.M., MacKenzie, S.B., Jeong-Yeon, L. and Podsakoff, N.P. (2003), “Common method biases in behavioral research: a critical review of the literature and recommended remedies”, <i>Journal of Applied Psychology</i>	18

**Table AI.**  
Top ten references

**Note:** The right column shows the number of citations out of 69 articles

Morgan, R.M. and Hunt, S.D. (1994), "The commitment-trust theory of relationship marketing", <i>Journal of Marketing</i>	48
Doney, P.M. and Cannon, J.P. (1997), "An examination of the nature of trust in buyer-seller relationships", <i>Journal of Marketing</i>	29
Moorman, C., Zaltman, G. and Deshpande, R. (1992), "Relationships between providers and users of market research: the dynamics of trust within and between organizations", <i>Journal of Marketing Research</i>	19
Zaheer, A., McEvily, B. and Perrone, V. (1998), "Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance", <i>Organization Science</i>	17
Mayer, R.C., Davis, J.H. and Schoorman, F.D. (1995), "An integrative model of organizational trust", <i>Academy of Management Review</i>	14
Moorman, C., Deshpande, R. and Zaltman, G. (1993), "Factors affecting trust in market research relationships", <i>Journal of Marketing</i>	12
Rousseau, D.M., Sitkin, S.B., Burt, R.S. and Camerer, C. (1998), "Not so different after all: a cross-discipline view of trust", <i>Academy of Management Review</i> , 23 (3)	10
Seppänen, R., Blomqvist, K. and Sundqvist, S. (2007), "Measuring inter-organizational trust a critical review of the empirical research in 1990-2003", <i>Industrial Marketing Management</i>	10
Bradach, J.L. and Eccles, R.G. (1989), "Price, authority, and trust. From ideal types to plural forms", <i>Annual Review of Sociology</i>	9
Dyer, J.H. and Chu, W.J. (2003), "The role of trustworthiness in reducing transaction costs and improving performance: empirical evidence from the United States, Japan, and Korea", <i>Organization Science</i>	9
<b>Note:</b> The right column shows the number of citations out of 69 articles	

**Table AII.**  
Top ten references  
with "trust" in the title

and management, namely the *Journal of Applied Psychology* (with 0.8 per cent of total references on the 19th place) and the *Psychological Bulletin* (with 0.6 per cent of total references on the 24th place). These two psychological journals are not in the top 25 list because of their contribution on the concept of trust, but because in both, there was a methodological article that was highly cited: Anderson and Gerbing (1988) in the *Psychological Bulletin* (20 times cited) and Podsakoff *et al.* (2003) in the *Journal of Applied Psychology* (18 times cited). In the top 50 list of journals, there are only five journals that do not have their roots in the domains of business and management.

Table AIII already gives the impression that industrial marketers studying trust predominantly shop around for inspiration and foundation of their academic work within the domain with which they are familiar, i.e. business and management. To further investigate the citation behaviour of scholars on trust within the field of industrial marketing, the 5,288 references are categorised according to the (expanded) SSCI. The results of this top-down approach on the investigation of interdisciplinarity are shown in Table AIV. A distribution of the articles from journals of the domains business, management, economics, psychology, sociology, law and philosophy is shown in Figure A1. These domains are selected based on the inquiry of Blomqvist (1997) on the many faces of trust, in which social psychology, philosophy, economics, contract law and marketing are defined as the main domains for an interdisciplinary perspective. The domains of sociology and psychology are not as abundant as one would expect on an interdisciplinary topic like trust. Furthermore, Table AIV and Figure A1 show already two obvious lacunas in the bibliographies of scholars on trust: law and philosophy. Furthermore, there are only some citations to works in the natural sciences, like biology (only one citation) and neuroscience (only four citations). One can conclude from these results that articles on trust published in *IMM*, *JBIM* and *JBBM* (2012-2015) have a rather narrow bibliography, in the sense that the domains of business and management are dominant, the domains psychology, economics and sociology have a minor impact, and citations to other domains occur only sporadically.

## Discussion

For further bibliometric research, a robustness check of the findings presented here is worthwhile. For example, do the older articles on trust have a more or less diverse bibliography than the young articles studied here? One could argue that the older articles on trust are more interdisciplinary because the industrial marketing discipline was still establishing itself and therefore investigated possible contributions of other disciplines more. On the other hand, one could also argue that in modern times it

Journal	Number of references	% of total (= 5,288)	Cumulative %
1 <i>Journal of Marketing</i>	547	10.3	
2 <i>Industrial Marketing Management</i>	438	8.3	18.6
3 <i>Journal of Marketing Research</i>	257	4.9	23.5
4 <i>Academy of Management Review</i>	169	3.2	26.7
5 <i>Journal of Business Research</i>	159	3.0	29.7
6 <i>Journal of the Academy of Marketing Science</i>	156	3.0	32.6
7 <i>Strategic Management Journal</i>	151	2.9	35.5
8 <i>Journal of Business &amp; Industrial Marketing</i>	124	2.3	37.8
9 <i>Academy of Management Journal</i>	98	1.9	39.7
10 <i>Organization Science</i>	93	1.8	41.5
11 <i>European Journal of Marketing</i>	82	1.6	43.0
12 <i>Journal of Operations Management</i>	81	1.5	44.5
13 <i>Administrative Science Quarterly</i>	70	1.3	45.9
14 <i>Journal of International Business Studies</i>	67	1.3	47.1
15 <i>Journal of Retailing</i>	56	1.1	48.2
16 <i>International Journal of Research in Marketing</i>	44	0.8	49.0
17 <i>Management Science</i>	44	0.8	49.8
18 <i>Journal of Management</i>	44	0.8	50.7
19 <i>Journal of Applied Psychology</i>	43	0.8	51.5
20 <i>Journal of Service Research</i>	41	0.8	52.3
21 <i>Journal of Consumer Research</i>	40	0.8	53.0
22 <i>Journal of Management Studies</i>	39	0.7	53.8
23 <i>Harvard Business Review</i>	36	0.7	54.4
24 <i>Psychological Bulletin</i>	33	0.6	55.1
25 <i>Journal of International Marketing</i>	32	0.6	55.7
26 <i>American Journal of Sociology</i>	30	0.6	56.2
27 <i>Organization Studies</i>	30	0.6	56.8
28 <i>Journal of Business-to-Business Marketing</i>	29	0.5	57.4
29 <i>Journal of Services Marketing</i>	28	0.5	57.9
30 <i>Journal of Supply Chain Management</i>	26	0.5	58.4
31 <i>Journal of Personal Selling &amp; Sales Management</i>	26	0.5	58.9
32 <i>Journal of Personality &amp; Social Psychology</i>	25	0.5	59.3
33 <i>International Marketing Review</i>	24	0.5	59.8
34 <i>International Journal of Service Industry Management</i>	22	0.4	60.2
35 <i>Journal of Marketing Management</i>	20	0.4	60.6
36 <i>MIS Quarterly</i>	20	0.4	61.0
37 <i>International Business Review</i>	18	0.3	61.3
38 <i>Psychology and Marketing</i>	18	0.3	61.6
39 <i>International Journal of Operations &amp; Production Management</i>	18	0.3	62.0
40 <i>Journal of Business Logistics</i>	18	0.3	62.3
41 <i>Supply Chain Management: An International Journal</i>	17	0.3	62.7
42 <i>Journal of Business Ethics</i>	16	0.3	63.0
43 <i>American Sociological Review</i>	15	0.3	63.2
44 <i>Decision Sciences</i>	15	0.3	63.5
45 <i>Management Decision</i>	15	0.3	63.8
46 <i>Journal of Marketing Theory &amp; Practice</i>	15	0.3	64.1
47 <i>Marketing Letters</i>	15	0.3	64.4
48 <i>Journal of Product Innovation Management</i>	14	0.3	64.6
49 <i>International Journal of Production Economics</i>	13	0.2	64.9
50 <i>International Journal of Physical Distribution &amp; Logistics Management</i>	13	0.2	65.1
51 <i>Industrial Management &amp; Data Systems</i>	13	0.2	65.4

**Table AIII.**  
Journals which are cited the most by current B2B scholars on trust

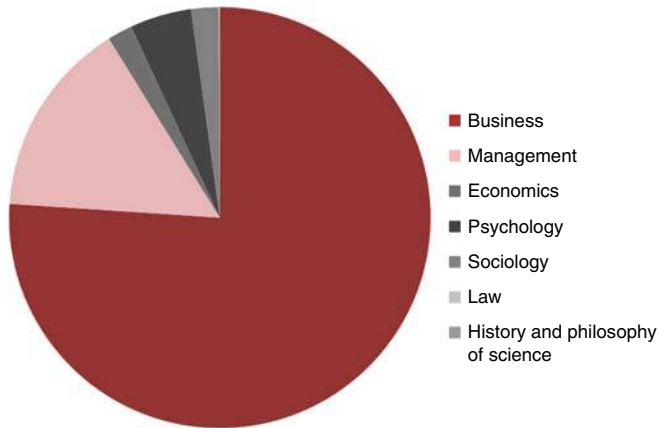
		Trust in B2B relationships
Business	3,016	
Business finance	6	
Management	600	
Operations research and management science	4	
Economics	76	
Agricultural economics and policy	2	
Social psychology	52	
Experimental psychology	7	
Clinical psychology	11	
Biological psychology	2	
Applied psychology	53	
Multidisciplinary psychology	58	
Mathematical psychology	4	
Sociology	84	
Social sciences, mathematical methods	8	
Interdisciplinary social sciences	1	
Social issues	3	
Public administration	2	
Political science	4	
International relations	8	
Urban studies	1	
Law	2	
Ethics	5	
History and philosophy of science	1	
History	1	
Cultural studies	1	
Hospitality, leisure, sport and tourism	5	
Communication	1	
Education	1	
Information science	13	
Computer science, information systems	3	
Computer science, interdisciplinary applications	13	
Computer science, artificial intelligence	2	
Automation and control systems	2	
Mathematics, interdisciplinary applications	1	
Industrial engineering	20	
Multidisciplinary engineering	1	
Environmental engineering	6	
Environmental studies	2	
Green, sustainable science and technology	1	
Food science and technology	2	
Biochemistry and molecular biology	1	
Astronomy	2	
Transportation	3	
Nursing	1	
Ergonomics	1	
Journals not in SSCI	400	
Book	674	
Conference paper/working paper/other references	121	

**Table AIV.**  
Distribution of  
references according  
to SSCI

is easier to have a more interdisciplinary approach since, by the rise of the internet and the upcoming of search engines like Google Scholar, the threshold of searching for articles in other disciplines is lower.

Furthermore, it might be interesting to also use a bottom-up approach (i.e. co-citation analysis of bibliographic coupling to reveal network structures) to give a more nuanced perspective on the interdisciplinarity of the trust literature within the field of industrial marketing. For the purpose of this paper, i.e. to investigate the contribution of the neuroscientific perspective, a top-down approach was sufficient, but to assess the complete level of interdisciplinarity, a bottom-up approach would give

**Figure A1.**  
The (not so) many faces of trust (Blomqvist, 1997): the distribution of journal citations over the seven main disciplines regarding trust



more in-depth insights. It is also worthwhile to investigate the visible benefit of having an interdisciplinary approach, by studying whether articles with a more diverse bibliography are cited more, as was found for the environmental sciences (Steele and Stier, 2000) (Table AV).

## Appendix 2. Glossary of neuroscience terms

### Amygdala

Brain structure that is involved with emotion, cognition and the regulation of autonomic processes. It is a part of the limbic system that is associated with the processing of intense emotions and socially relevant information.

### Anterior paracingulate cortex

Prefrontal region that is associated with explaining and predicting other people's behaviour and understanding intentions (also called "mentalizing").

### Caudate nucleus

Portion of the basal ganglia that is associated with the anticipation on positive rewards.

### Dorsomedial prefrontal cortex

Part of the prefrontal cortex that is associated with sense making and attending emotional states.

### EEG

Electroencephalography, a non-invasive method to measure electrical activity of the brain by using electrodes.

### fMRI

Functional magnetic resonance imaging, a non-invasive method to measure brain activity by detecting changes in the cerebral blood flow.

### Hyper-fMRI

fMRI research in which multiple subjects, each in separate MRI scanners, can interact with each other while their brain activity is simultaneously measured.



**Insula**

Portion of the cerebral cortex involved with emotional processing and associated with a fear of loss and gut feelings.

**Limbic system**

A collection of brain structures (amygdala, cingulate cortex, fornix, hippocampus and hypothalamus) which is involved with emotional life, memory and motivation.

**Orbitofrontal cortex**

Prefrontal cortex region that is associated with the cognitive processing of decision making, and in particular with calculating uncertainty.

**Oxytocin**

A neuropeptide which functions as a hormone. It is associated with social bonding and interpersonal trust.

**Prefrontal cortex**

Part of the cortex that is associated with planning, decision making and thought.

**Putamen**

Portion of the basal ganglia that is associated with the prediction of rewards.

**Testosterone**

The primary male sex hormone which is associated with aggressive and antisocial behaviour.

**Ventromedial prefrontal cortex**

Part of the prefrontal cortex that is associated with the processing of risk and fear, self-control and decision making.

*Included*

- 1 Mandják, T., Szalkai, Z., Neumann-Bódi, E., Magyar, Má. and Simon, J. (2015), "Emerging relationships: How are they born?", *Industrial Marketing Management*
- 2 Jiang, X., Jiang, F., Cai, X. and Liu, H. (2015), "How does trust affect alliance performance? The mediating role of resource sharing", *Industrial Marketing Management*
- 3 Valtakoski, A. (2015), "Initiation of buyer-seller relationships: the impact of intangibility, trust and mitigation strategies", *Industrial Marketing Management*
- 4 Cuevas, J.M., Julkunen, S. and Gabrielsson, M. (2015), "Power symmetry and the development of trust in interdependent relationships: the mediating role of goal congruence", *Industrial Marketing Management*
- 5 Dowell, D., Morrison, M. and Heffernan, T. (2015), "The changing importance of affective trust and cognitive trust across the relationship lifecycle: a study of business-to-business relationships", *Industrial Marketing Management*
- 6 Capaldo, A. and Giannoccaro, I. (2015), "Interdependence and network-level trust in supply chain networks: a computational study", *Industrial Marketing Management*
- 7 Graca, S.S., Barry, J.M. and Doney, P.M. (2015), "Performance outcomes of behavioral attributes in buyer-supplier relationships", *Journal of Business and Industrial Marketing*
- 8 Elo, M., Benjowsky, C. and Nummela, N. (2015), "Intercultural competences and interaction schemes – four forces regulating dyadic encounters in international business", *Industrial Marketing Management*
- 9 Gorton, M., Angell, R., Dries, L., Urutyan, V., Jackson, E. and White, J. (2015), "Power, buyer trustworthiness and supplier performance: evidence from the Armenian dairy sector", *Industrial Marketing Management*
- 10 Zhang, C., Wu, F. and Henke, J.W. Jr (2015), "Leveraging boundary spanning capabilities to encourage supplier investment: a comparative study", *Industrial Marketing Management*
- 11 Jack, E.P. and Powers, T.L. (2015), "Managing strategic supplier relationships: antecedents and outcomes", *Journal of Business and Industrial Marketing*
- 12 Chang, Y.S. and Fang, S.R. (2015), "Enhancing export performance for business markets: effects of interorganizational relationships on export market orientation (EMO)", *Journal of Business-to-Business Marketing*
- 13 Yang, S.Q. (2015), "Understanding B2B customer loyalty in the mobile telecommunication industry: a look at dedication and constraint", *Journal of Business and Industrial Marketing*
- 14 Munksgaard, K.B., Johnsen, R.E. and Patterson, C.M. (2015), "Knowing me, knowing you: self- and collective interests in goal development in asymmetric relationships", *Industrial Marketing Management*
- 15 Lai, W.-H. and Woodside, A. (2015), "Heuristics-in-use in industrial interfirm-collaborating clusters", *Journal of Business and Industrial Marketing*
- 16 Guenzi, P. and Panzeri, F. (2015), "How salespeople see organizational citizenship behaviors: An exploratory study using the laddering technique" *Journal of Business and Industrial Marketing*
- 17 Chang, H.H., Tsai, Y.-C., Chen, S.-H., Huang, G.-H. and Tseng, Y.H. (2015), "Building long-term partnerships by certificate implementation: a social exchange theory perspective", *Journal of Business and Industrial Marketing*
- 18 Sharma, N., Young, L.C. and Wilkinson, I. (2015), "The nature and role of different types of commitment in inter-firm relationship cooperation", *Journal of Business and Industrial Marketing*
- 19 Jain, M., Khalil, S., Johnston, W.J. and Cheng, J.M.-S. (2014), "The performance implications of power-trust relationship: the moderating role of commitment in the supplier-retailer relationship", *Industrial Marketing Management*
- 20 Banerjee, P. and Ma, L. (2014), "The process of trust formation in e-business: insights from case studies of two small firms", *Journal of Business-to-Business Marketing*
- 21 Huemer, L. (2014), "Creating cooperative advantage: The roles of identification, trust, and time", *Industrial Marketing Management*
- 22 Saleh, M.A., Ali, M.Y. and Andaleeb, S.S. (2014), "Explaining industrial importers' commitment from an emerging market perspective: theoretical and managerial insights", *Journal of Business and Industrial Marketing*
- 23 Bruhn, M., Schnebelen, S. and Schäfer, D. (2014), "Antecedents and consequences of the quality of e-customer-to-customer interactions in B2B brand communities", *Industrial Marketing Management*
- 24 Newton, J.D., Ewing, M.T. and Collier, P.M. (2014), "Resolving contradictions in institutional demands through loose coupling", *Industrial Marketing Management*
- 25 Abosag, I. and Naudé, P. (2014), "Development of special forms of B2B relationships: Examining the role of interpersonal liking in developing Guanxi and Et-Moone relationships", *Industrial Marketing Management*
- 26 Vieira, A.L., Winklhofer, H. and Ennew, C. (2014), "The effects of relationship marketing on share of business: a synthesis and comparison of models", *Journal of Business-to-Business Marketing*

**Table AV.**  
Included and excluded  
articles for the  
exploratory  
bibliometric research

(continued)

- 
- 27 Akrouf, H. (2014), "Relationship quality in cross-border exchanges: a temporal perspective", *Journal of Business-to-Business Marketing*
- 28 Biggemann, S., Williams, M. and Kro, G. (2014), "Building in sustainability, social responsibility and value co-creation", *Journal of Business and Industrial Marketing*
- 29 Filieri, R., McNally, R.C., O'Dwyer, M. and O'Malley, L. (2014), "Structural social capital evolution and knowledge transfer: evidence from an Irish pharmaceutical network", *Industrial Marketing Management*
- 30 Moliner-Velazquez, B., Fuentes-Blasco, M. and Gil-Saura, I. (2014), "Value antecedents in relationship between tourism companies", *Journal of Business and Industrial Marketing*
- 31 Chelariu, C. and Osmonbekov, T. (2014), "Communication technology in international business-to-business relationships", *Journal of Business and Industrial Marketing*
- 32 Human, G. and Naudé, P. (2014), "Heterogeneity in the quality-satisfaction-loyalty framework", *Industrial Marketing Management*
- 33 Marquardt, A.J. (2013), "Relationship quality as a resource to build industrial brand equity when products are uncertain and future-based", *Industrial Marketing Management*
- 34 Jiang, Z., Shiu, E., Henneberg, S. and Naude, P. (2013), "Operationalizing trust, reliance, and dependence in business relationships: responding to the ongoing naming and cross-level problems", *Journal of Business-to-Business Marketing*
- 35 Zanini, M.T. and Musante, M. (2013), "Trust in the knowledge economy", *Journal of Business and Industrial Marketing*
- 36 Ekici, A. (2013), "Temporal dynamics of trust in ongoing inter-organizational relationships", *Industrial Marketing Management*
- 37 Jiang, X., Li, M., Gao, S., Bao, Y. and Jiang, F. (2013), "Managing knowledge leakage in strategic alliances: the effects of trust and formal contracts", *Industrial Marketing Management*
- 38 Obal, M. (2013), "Why do incumbents sometimes succeed? Investigating the role of interorganizational trust on the adoption of disruptive technology", *Industrial Marketing Management*
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