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It's Complicated: Explaining the Relationship between Trust, Distrust, and Ambivalence in Online Transaction Relationships Using Polynomial Regression Analysis and Response Surface Analysis

Abstract

Trust and distrust are considered crucial elements affecting online relationships – particularly those involving electronic transactions. Although some studies propose that they are distinct, others claim that they are merely opposite ends of one continuum. Further adding to the debate is the possibility of ambivalence, a topic that has not been examined in electronic transaction relationships. Unfortunately, current models of trust and distrust have limitations that impede explanations of how – or even *if* – ambivalence is generated by feelings of trust and distrust and how these two constructs can best coexist. We thus propose a hybrid model which considers the limitations and strengths of previous models. Namely, we posit that trust and distrust can coexist as separate components with related continua. We use polynomial regression analysis (PRA) and response surface analysis (RSA) to test these complex relationships.

Using an empirical study of online consumer behaviour with 521 experienced online consumers, strong empirical validation is found for the model. We examine the effects of ambivalence on the truster's intentions towards a website and find a small positive effect which increases such intentions. PRA and RSA confirm that trust and distrust are most likely separate components – not opposite ends of a continuum – with related continua. The continua within the subconstructs of trust and distrust likely have more complex and interesting relationships than have been considered previously. These findings lead to interesting future research opportunities on trust, distrust and ambivalence using advanced techniques such as PRA and RSA.

Keywords

Trust, distrust, ambivalence, electronic transactions, HCI, online behaviour, online relationships, polynomial regression analysis, response surface analysis, Internet, online consumer

Substantial research has focused on the critical role of trust in the success of Internet-based online transactions and relationships (Jarvenpaa & Tractinsky, 1999; Ba & Pavlou, 2002; McKnight *et al.*, 2002; Gefen *et al.*, 2003; Naquin & Paulson, 2003; Gefen & Straub, 2004; Pavlou & Fygenson, 2006; Komiak & Benbasat, 2008; Lowry *et al.*, 2008; Dimoka, 2010); referred to as *online transactions* here for brevity). Trust is typically more important online than with face-to-face relationships or transactions (Naquin & Paulson, 2003; Yakovleva *et al.*, 2010). It is evident when a trustor displays a willingness to be vulnerable to the trustee based on expectations that the trustee will perform as desired (Mayer *et al.*, 1995). Conversely, distrust occurs when a person expects that the other party either will not or cannot perform the desired behaviours and is unwilling to cope with such outcomes, possibly acting in a negative manner towards the person (McKnight & Chervany, 2001). Initially, researchers posited that distrust was simply low trust, and that distrust could be overcome simply through the development of trust (e.g., Mayer *et al.*, 1995; McKnight *et al.*, 1998). More recent research has proposed that distrust is a distinct construct that differs from low trust (Benamati *et al.*, 2006; McKnight & Choudhury, 2006; Wu *et al.*, 2006; Komiak & Benbasat, 2008; Dimoka, 2010; Lowry *et al.*, 2014; Lowry *et al.*, 2015). Given the obvious role of trust and distrust in the development of online transactions, it is crucial for researchers to understand both constructs and their relationships.

Adding to the potential complexity of the trust–distrust relationship is the possible creation of ambivalence, which has only recently been examined in the context of online transactions (Moody *et al.*, 2014) and remains a compelling area for future e-commerce research (Jarvenpaa & Majchrzak, 2010). *Ambivalence* is when an individual holds at least two contradictory attitudes of similar magnitudes (Thompson & Zanna, 1995) towards the same object (Kaplan, 1972). Attitudinal ambivalence is an important psychological phenomenon that has been studied in many different personal and organisational behavioural contexts (e.g., Brooks *et al.*, 2003; MacDonald & Hynie, 2008; Oreg & Sverdlik, 2011; Ziegler *et al.*, 2012). Importantly, trust and distrust must exist as separate components if they are to work together to create ambivalence; distrust is a functional equivalent of trust, and it aids in the ability to understand one's environment (Lewicki *et al.*, 1998). Distrust can be conceptualised as a negative attitude, and trust as a positive one. In situations in which an individual feels both a positive and negative attitude towards the same object, both attitudes coexist, thereby engendering ambivalence. Earlier research on trust and distrust did not investigate the creation of ambivalence, because the two concepts were considered opposite ends of the same spectrum (Rotter, 1980; McKnight *et al.*, 2002).

By extending the ambivalence literature to include both trust and distrust, the joint effects of trust and distrust in online transactions can be theoretically explored in light of conflicting attitudes towards online sellers, which can create ambivalence (Kaplan, 1972; Conner *et al.*, 2002; Priester *et al.*, 2007). Ambivalence could also alter how buyers process information. Moreover, observing and understanding

this alteration could provide additional insights for future online transactions research (Priester *et al.*, 2007; Jarvenpaa & Majchrzak, 2010). Some researchers have proposed that distrust signals might increase the motivation to seek certainty, thereby causing information to be processed systematically; this might paradoxically lead buyers to engage in more trusting behaviours (Schul *et al.*, 2008; Lowry *et al.*, 2015). At a minimum, the intentions to engage are strengthened in either a positive or negative direction. This opportunity leads to the research question that guides this study:

RQ: Can ambivalence be created in online transactions and relationships, and if so, which subconstructs of trust and distrust are the main drivers of such ambivalence?

To address the research question, we briefly review the different conceptualisations of trust and distrust and then dig deeply into the construct of ambivalence introduced by Moody *et al.* (2014), and investigate how it might be generated in online transactions and relationships. Current models of trust and distrust are limited because they fail to address how ambivalence is generated by trust and distrust, as well as how trust, distrust and ambivalence can best coexist. We thus propose a hybrid model of trust–distrust to account for the limitations and strengths of previous models of analysis. We then introduce a study that explores the research questions and tests the hybrid model of trust–distrust. Not surprisingly, these complex relationships cannot be tested through standard procedures. Klein *et al.* (2009) called for behavioural researchers to better test and understand complex constructs using more appropriate analytical techniques such as polynomial regression analysis (PRA) and response surface analysis (RSA). We have found strong support for the use of these techniques. The paper concludes with a discussion of the contributions and limitations of this research.

Background on Trust, Distrust and Ambivalence

The Difference between Trust and Distrust Online

Trust is crucial in face-to-face relationships. Because it enables consumers to enter into transactions with sellers, trust is even more crucial in online relationships in which the relationship between the individual and the organisation often lacks history, reliable information, a shared context (Dellarocas, 2006; Graebner, 2009; Dimoka, 2010) or expectations of future interactions (Dellarocas, 2003; Hann *et al.*, 2007) and decision making (Lowry *et al.*, 2010). Online relationships also exhibit significant asymmetries of information (Ba & Pavlou, 2002; Dellarocas, 2006). Therefore, most online trust research has focussed on the critical role that trust plays in the success of the Internet (McKnight *et al.*, 2002; Gefen *et al.*, 2003; Pavlou & Fygenson, 2006; Komiak & Benbasat, 2008; Lowry *et al.*, 2008).

This study adopts generally accepted conceptualisations of trust and distrust in the context of online transactions and relationships (i.e., McKnight *et al.*, 2002; McKnight & Choudhury, 2006; Komiak & Benbasat, 2008; Dimoka, 2010; Lowry *et al.*, 2014). The conceptual foundation of trust is *trusting beliefs* – the willingness of the truster to become vulnerable to the trustee based on the belief that the

trustee will perform a desired behaviour (Mayer *et al.*, 1995; McKnight *et al.*, 1998). Trusting beliefs are grouped into three subconstructs, namely competence, benevolence and integrity (McKnight *et al.*, 2002)ⁱ. In contrast, *distrusting beliefs* involve unwillingness to become vulnerable to the trustee based on the belief that the trustee will not perform the desired behaviour (McKnight & Chervany, 2001; McKnight *et al.*, 2003). Distrusting beliefs are operationalised in terms of three subconstructs that hold the opposite valence of the trust subconstructs, namely incompetence, malevolence and deceit (McKnight *et al.*, 2004; McKnight & Choudhury, 2006; Lowry *et al.*, 2014). *Incompetence* refers to the individual's belief that the organisation lacks the ability to perform a desired behaviour. *Malevolence* denotes the individual's belief that the organisation has the intention to harm him/her. Finally, *deceit* refers to the individual's belief that the organisation is dishonest and predisposed to provide false information. An organisation's website is a virtual agent that works towards building trust perceptions and diminishing distrust perceptions.

Ambivalence Resulting from Conflicting Trust and Distrust Beliefs Online

Responding to the call for ambivalence research in online transactions (Jarvenpaa & Majchrzak, 2010), and extending the work of Moody *et al.* (2014), we propose ambivalence as a key addition to the online transaction literature on trust and distrust. In ambivalence, an individual is inclined to hold both positive and negative evaluations of an attitude object (Thompson & Zanna, 1995), as two separate constructs; their combination has the potential to produce attitudinal ambivalence if they are both held at roughly equivalent intensities towards the same attitude object (Kaplan, 1972; Jonas *et al.*, 1997).

A better understanding of attitudes is essential for understanding ambivalence. Research has posited that attitudes consist of multiple components, namely feelings, beliefs, and behavioursⁱⁱ (e.g., Rosenberg & Hovland, 1960; Trafimow & Sheeran, 1998; Kachadourian *et al.*, 2005). Ambivalence can occur within (*i.e.*, *intra*component ambivalence) or between (*i.e.*, *inter*component ambivalence) these three components (Thompson & Zanna, 1995; Maio *et al.*, 1996; MacDonald & Zanna, 1998).

Ambivalence can thus be created by conflicting attitudes within the same component (*e.g.*, positive and negative feelings) or different components with opposing valences (*e.g.*, positive feelings and negative beliefs). For example, ambivalence can occur in everyday decisions, such as in evaluating a car that has poor style (triggering negative affect) but good gas mileage (triggering positive beliefs), or in considering a candidate who has excellent media appeal (triggering positive affect) but has stated goals that are not personally beneficial (triggering negative beliefs).

During an online transaction, suppose that an online buyer holds trusting (positive) affect towards a seller because of numerous customer ratings, which serve as an indicator of the seller's benevolent reputation. Yet, the buyer might also feel distrust towards the seller because of the perception that the seller lacks competence, as demonstrated by errors or incomplete information about the product (Everard & Galletta, 2005). Such a scenario would cause the buyer to feel both trust and distrust simultaneously

related to different seller characteristics, which will eventually be used to formulate a decision (*i.e.*, intention) regarding the purchase of an item from the seller. If each of these feelings is relatively strong, then it is likely that the buyer will experience a form of intercomponent ambivalence.

Authors of the extant literature on trust and distrust have concluded that these constructs can coexist and are of opposite valences (e.g., Lewicki & Bunker, 1996). Specifically, trust involves positive expectations of the seller's behaviours, whereas distrust focusses on the buyer's negative expectations of these behaviours (Luhmann, 1979; Lewicki & Bunker, 1996; McKnight *et al.*, 2004). Each of these beliefs can result in a positive or negative expectation of the trustee's behaviour by the truster. Accordingly, trusting and distrusting beliefs can be juxtaposed in a truster, resulting in conflicting beliefs regarding the seller's trustworthiness.

Mixed, concurrent beliefs have been shown to result in attitudinal ambivalence (Kaplan, 1972; Maio *et al.*, 1996; Brooks *et al.*, 2003; Kachadourian *et al.*, 2005; Priester *et al.*, 2007; MacDonald & Hynie, 2008; Oreg & Sverdlik, 2011; Ziegler *et al.*, 2012). A similar effect has also been proposed regarding trust and distrust (Lewicki & Bunker, 1996), but to our knowledge, this has never been tested until the present study. To help overcome some of the contradictions in the literature, we next propose a model, followed by testing in an empirical study.

Proposing a Hybrid Model of Trust and Distrust

Although bidimensional models of trust are gaining more acceptance than unidimensional ones, they both have advantages and disadvantages. This section thus first explains the models, reviews their strengths and weakness and combines their strengths to propose a unique hybrid model of trust and distrust; this is further tested using advanced methodology and analysis.

Single versus Bidimensionality of Trusting and Distrusting Beliefs

Despite widespread agreement on the definitions of trusting beliefs and distrusting beliefs, two major, contradictory approaches to conceptualising trust and distrust have emerged. The first approach assumes that trust and distrust are at opposite ends of one continuum; thus, increasing trust is all that is needed to avoid the possibility of distrust (Rotter, 1980; McKnight *et al.*, 2002). The second approach posits that trust and distrust not only have opposite valences, but are also distinct, separate constructs (Lewicki *et al.*, 1998; McKnight *et al.*, 2003; Komiak & Benbasat, 2008; Dimoka, 2010).

Unidimensional models treat trust and distrust as opposite ends of one continuum (Rotter, 1980; Barber, 1983), so that they are mutually exclusive (Lewicki & Bunker, 1996), working as substitutes for each other (Lewis & Weigert, 1984). The assumption is that if the global trust score is high, there is trust; if it is low, there is distrust. These models propose that trust has several components that can be captured within a global construct that measures a consumer's overall trust (McAllister, 1995; Williams, 2001). Based on the perception of the seller's trustworthiness, an individual expects that the organisation will

behave in a desired manner, making him/her willing to become vulnerable to the organisation (Williams, 2001).

These unidimensional models of trust and distrust are built on earlier trust research based on economic game theory, wherein trust was conceptualised as cooperative behaviour, and distrust as opportunistic behaviour (Arrow, 1974). Additionally, this approach depicted trust and distrust as substitutes for one another (Lewis & Weigert, 1984), as mutually exclusive rather than separate constructs (Lewicki & Bunker, 1996).

The unidimensional assumption was challenged by the bidimensional approach to trust and distrust. Bidimensional models of trust (Lewicki *et al.*, 1998; McKnight & Choudhury, 2006; Dimoka, 2010) are based on the conceptual foundation that the trust construct, with its positive valence, is separate from the distrust construct, with its negative valence (Kaplan, 1972; Kahneman & Tversky, 1979), with both generally consisting of corresponding but opposite underlying components. Under this conceptualisation, trust includes positive expectations regarding a trust target's conduct, whereas distrust includes negative expectations (Luhmann, 1979). The trust target is most often an organisation that could behave in an unpredictable manner.

Although both trust and distrust are used to describe expectations about the organisation's behaviour, nuanced theoretical differences exist between the two constructs. First, trust reduces an individual's expectations of possible undesirable actions by the organisation, whereas distrust increases such expectations (Luhmann, 1979). Both mechanisms help to reduce social complexity (Gefen, 2002), albeit in opposite directions. Trust enables individuals to consider future events by minimising the outcomes to include mainly positive events; distrust enables individuals to focus primarily on negative outcomes that may occur.

Although the two constructs are framed as having opposite valences and expectancies under the bidimensional conceptualization, they are treated as independent of each other (Lewicki *et al.*, 1998), even though they are moderately correlated (McKnight & Choudhury, 2006). Thus, low trust from this perspective is not conceptually equivalent to high distrust. Low trust refers to uncertainty or a lack of hope regarding the trustee's behaviour, whereas high distrust is associated with increased fear, scepticism and vigilance (Lewicki *et al.*, 1998). Likewise, high trust is not the same as low distrust. High trust relates to feelings of hope, faith and confidence in the trustee, whereas low distrust suggests minimal fear, scepticism, cynicism or the need to monitor the trustee (Lewicki *et al.*, 1998; 2006).

Bidimensional models of trust and distrust propose that the relationship between an individual and an organisation and its website is more complex than the unidimensional model considers it to be. Lewicki *et al.* (1998) explained that most relationships are complex and have various facets in which distrust or trust can be held simultaneously; thus, it impossible to assign a generic label of trust or distrust

to a relationship. Instead, a relationship can contain a collection of rather specific aspects of an organisation that are trusted or distrusted separatelyⁱⁱⁱ.

Strengths and Shortcomings of Unidimensional Models of Trust

Unidimensional approaches to trust and distrust have several strengths that we adopt in the model. First, the major advantage of such models is the ability to provide a single negative or positive trust score for a relationship between an individual and an organisation (McKnight *et al.*, 2002; Krishnan *et al.*, 2006; Puranam & Vanneste, 2009; Tomlinson & Mayer, 2009). Unidimensional models have been used in a variety of studies, largely because they are easier to measure than bidirectional models of trust, because they involve fewer items and subconstructs, if any.

Second, attitudinal research (Kaplan, 1972; Cacioppo & Bernston, 1994; Williams & Aaker, 2002) has shown that diametrically-opposed positive and negative beliefs about a specific item cannot exist in equal strength^{iv}. Thus, unidimensional models assume and measure each attribute or fact as a single attitude, which is built on the related beliefs for that attribute or fact, which is consistent with how information is stored in long-term memory (Williams & Aaker, 2002). Ultimately, an individual holds a single, more intense belief about each piece of information in memory and invalidates outdated information, a process consistent with cognitive dissonance theory (Festinger, 1957).

Third, unidimensional models have found strong empirical support for the nomological network of trust, which has advanced trust research greatly over the past several decades (Schoorman *et al.*, 2007). Such research has highlighted numerous antecedents of trust that have not been applied to distrust. Amidst a paucity of research showing antecedents of distrust, greater explanatory power is provided by the unidimensional model of trust and distrust when exploring online individual–organisational trust relationships than the bidimensional conceptualisation.

Unidimensional approaches have several shortcomings. First, the basic premise of these models is that trust and distrust cannot coexist, and that an online user will utilise only one of the two states as a mechanism to simplify social situations by reducing the number of potential future outcomes with the organisation and its website (Deutsch, 1958; Rotter, 1980). However, recent work on trust and distrust has found that the two constructs do appear to coexist (Dimoka, 2010). Komiak and Benbasat (2008) specifically reported that trust and distrust existed in the users' attitudes towards online recommendation agents during an online transaction.

Second, these models' overemphasis on trust ignores the strong possibility that distrust, as a construct of negative valence, might have a stronger influence on intentions and subsequent behaviours (Kaplan, 1972; Kahneman & Tversky, 1979). Several studies have demonstrated that distrust indeed has a stronger influence on individual attitudes and beliefs (Kahneman & Tversky, 1979; Kramer, 1999). Likewise, Dimoka's (2010) fMRI study of trust and distrust in an online auction found that the

subdimensions of distrust were the only significant predictors of price premiums.

Third, unidimensional models assume that trust between individuals and organisations generalises across their entire relationship. Yet, many studies on trust have identified various facets of trust, which defy such generalisations (Mayer *et al.*, 1995). Although trust is generally conceptualised as a prerequisite for knowledge exchange in online communities (Levin & Cross, 2004; Porter & Donthu, 2008; Almirall & Casadesus-Masanell, 2010), people exhibit preferences for competence despite the benevolent intentions of others in a community (Ba, 2001; Clemons *et al.*, 2002; Jarvenpaa & Majchrzak, 2010)^v.

Finally, and perhaps most interestingly, unidimensional models do not account for intra-aspect conflict in which differing subconstructs have opposing valences within the dimensions of trust (Kaplan, 1972). If an individual believes that an organisation is dependable and competent but has a slightly negative orientation towards the individual, he/she may have only moderate to low trust levels that may result in subsequent weak intentions to purchase from the organisation. However, if the perception of negative orientation increases, it is difficult to predict how the positive and negative perceptions will ‘net out’ in the unidimensional model: This is where ambivalence becomes an important concept to consider.

Unidimensional models further posit that low levels of trust have relatively little impact on intentions and behaviours (McKnight *et al.*, 1998; McKnight *et al.*, 2002), which undermines the predictions of trust-dependent online behaviours (*e.g.*, joining a community, sharing information, buying an item or subscribing to RSS feeds). Instead, we argue that it is more logical to compare the relative magnitudes of the given trust subconstructs/beliefs, the reliabilities of these ratings and how these weighted magnitudes influence the overall decision to trust or distrust. Further, by supposing that low trust is in fact distrust, unidimensional models ignore the possibility that distrust may have a more powerful impact on intentions. By assuming trust and distrust are opposite ends of one continuum, unidimensional models place this relationship on a linear scale, which does not allow for differential effects. The bidimensional model, using two continua, would be able to present more complicated relationships because it can include second-order variables.

Table 1 summarises the literature on the unidimensional model of trust. We then show the core assumptions related to the unidimensional model that each study follows, along with our explanation.

Strengths and Shortcomings of Bidimensional Models of Trust

Researchers have identified limitations of unidimensional models of trust and distrust, and proposed that these approaches be modified to either include distrust in a more prominent role (McKnight & Chervany, 2001) or acknowledge that trust and distrust can coexist (Lewicki *et al.*, 1998; Kramer, 1999). A major strength of such models is that they support a multidimensional view of trust and distrust, which is lacking in many unidimensional models.

Despite the improvements made by the bidimensional models, they have two major shortcomings

Table 1 Strengths and Limitations of Unidimensional Models of Trust and Distrust

<i>Model Feature</i>	<i>Core Assumptions (Example Citations)</i>	<i>Support or Refutation of Assumptions</i>
Single trust construct	Trust is specified as a single construct (McKnight <i>et al.</i> , 2002; Gefen & Pavlou, 2012; Fang <i>et al.</i> , 2014).	Pro: Simplification of trust into one construct allows its inclusion in many models, which has greatly advanced trust research (Tomlinson & Mayer, 2009).
Exclusability of positive and negative dimensions	Information that underlies an attitude or belief cannot be both positive and negative (McKnight <i>et al.</i> , 1998; Tomlinson & Mayer, 2009).	Con: The separation of underlying information into positive and negative components is not supported in attitudinal research (Cacioppo & Bernston, 1994).
Extensive nomological network	The nomological network of trust has been of great interest and research on it is extensive (Mayer <i>et al.</i> , 1995; Dennis <i>et al.</i> , 2012; Lim <i>et al.</i> , 2012; Liu & Goodhue, 2012; Fang <i>et al.</i> , 2014).	Pro: The larger nomological network has greatly expanded our understanding of trust and highlighted its importance (Mayer <i>et al.</i> , 1995).
Trust and distrust cannot coexist	Basic assumption of the model is that trust is a continuum with high trust on one end and high distrust on the other. A trustee may thus feel only trust or distrust (Deutsch, 1958, 1960; Dennis <i>et al.</i> , 2012; Lim <i>et al.</i> , 2012; Liu & Goodhue, 2012).	Con: Empirical studies have found that a truster is able to feel both trust and distrust toward the same trustee (Dimoka, 2010; Lowry <i>et al.</i> , 2014; Moody <i>et al.</i> , 2014).
Focus on trust at the expense of distrust	Model deals with the creation of trust and avoidance of distrust. Emphasis is given to trust at the expense of distrust. This emphasis creates the assumption that the positive effect size of trust is equal to or greater than the effect size of distrust (McKnight <i>et al.</i> , 1998; McKnight <i>et al.</i> , 2002; Dennis <i>et al.</i> , 2012; Lim <i>et al.</i> , 2012; Liu & Goodhue, 2012).	Con: Research on negatively-valenced attitudes has found that their effect sizes are greater than those of positively-valenced attitudes. Thus, research should focus on distrust as the potentially more influential attitude (Kahneman & Tversky, 1979).
Generalised trust	Model treats trust as a general attitude one has toward another that holds for all aspects of the relationship (Ba & Pavlou, 2002).	Con: Trust research has found that trust is multi-faceted and that several aspects of trust can be found in one relationship. The truster counts on one or more specific outcomes from the trustee (Hardin, 1993; Lewicki <i>et al.</i> , 2006).
Conflicts between trust and distrust	Because trust is proposed to not coexist with distrust, it is unable to predict what outcomes would result when both trust and distrust are present in a relationship (Deutsch, 1958, 1960).	Con: Ambivalence literature shows that the coexistence of oppositely valenced attitudes may result in ambivalence (Kaplan, 1972).

on which this study's hybrid model capitalises. The first is that bidimensional models have ignored ambivalence in organisational trust relationships, despite the important role it may play (Jonas *et al.*, 1997; Petty *et al.*, 2006; Petty *et al.*, 2007) and recent calls to examine the construct in managerial research (Lewicki *et al.*, 2006; Jarvenpaa & Majchrzak, 2010). The coexistence of trust and distrust naturally leads to an instantiation of ambivalence, which informs the debate between the bidimensional and unidimensional camps. Ambivalence has largely been overlooked in managerial research despite its prominent role in psychological models, which recognised that positive and negative attitudes often

coexist and can be modelled independently (Kaplan, 1972; Kahneman & Tversky, 1979). However, taking into account more recent, highly salient attitudinal work in psychology (Jonas *et al.*, 1997; Petty *et al.*, 2006; Petty *et al.*, 2007), the absence of ambivalence in trust models is all the more conspicuous.

The second shortcoming is that these models assume that the core beliefs which form trust and distrust are simultaneously positive and negative. Kaplan (1972) originally proposed differentiating between positive and negative attitudes as separable constructs, rather than ends of one continuum. Although this perspective was eventually adopted by trust researchers in the bidimensional camp, bidimensional models do not incorporate trusting and distrusting beliefs in the manner suggested by Kaplan and other attitudinal researchers. This research stream posits that while positive and negative attitudes can be separated from each other, the underlying beliefs that form these attitudes are not as separable (Kaplan, 1972; Cacioppo & Bernston, 1994; Priester & Petty, 1996). Unlike an attitude, a single belief cannot vary from positive to negative for an individual; rather, a belief will be positive or negative – a single fact about one thing (Kaplan, 1972; Cacioppo & Bernston, 1994; Petty *et al.*, 2006). Accordingly, an individual may hold some positive and some negative trust/distrust beliefs, but a single belief will not be simultaneously positive and negative^{vi}.

Table 2 summarises the literature that is based on the bidimensional model of trust, along with its assumptions and empirical support. Notably, not all of the assumptions of this model have been supported to date.

A Hybrid Conceptualisation of Trust and Distrust: Overall Trust-Based Beliefs

This study addresses the limitations of both the unidimensional and bidimensional approaches by proposing a new construct that reconciles trust and distrust, namely *overall trusting intentions*, or distrusting intentions when the negative distrust beliefs outweigh the positive trusting beliefs. Distrusting intentions are precipitated when an individual perceives one or more of the belief subconstructs to be negative. Likewise, trusting intentions are induced when an individual perceives one or more of the three beliefs subconstructs to be positive. Thus, overall intentions are formed from six belief subconstructs: the three subconstructs of trust and the three subconstructs of distrust. Figure 1 shows the hybrid formation of overall trusting intentions from trust and distrust beliefs, adopting concepts and assumptions from both the unidimensional and bidimensional perspectives and from attitudinal research.

First, in conceptualising overall intentions, both trust and distrust are modelled using the generally accepted three dimensions from both the unidimensional and bidimensional conceptualisations that form trust, namely *ability*^{vii}, *orientation*^{viii} and *dependability*^{ix}. Thus, we propose that *overall trust-based intentions* is a multidimensional construct comprising positive and negative belief continua. Second, building on the bidimensional model of trust, the subdimensions enable trust and distrust to coexist in a relationship between an individual and an online organisation. Each of the three trust belief

subdimensions (ability, orientation and dependability) might exhibit either a negative or a positive instantiation on that belief dimension. These three dimensions are then aggregated to form overall trust, a second-order formative belief construct of trust or distrust. Based on these two belief constructs, an overall trust-based attitude would be formed when arriving at an intention or behaviour. This attitude is based on the trust and distrust-based beliefs depicted in Figure 1.

Table 2 Strengths and Limitations of the Bidimensional Models of Trust and Distrust

<i>Model Feature</i>	<i>Explanation (Example Citations)</i>	<i>Empirical Support</i>
Separation of trust and distrust	Trust and distrust coexist and are separable constructs (McKnight <i>et al.</i> , 2004; McKnight & Choudhury, 2006).	Empirical support found in (Xiao & Benbasat, 2007; Dimoka, 2010; Ou & Sia, 2010; Riedl <i>et al.</i> , 2010; Gefen & Pavlou, 2012; Fang <i>et al.</i> , 2014; Lowry <i>et al.</i> , 2014).
Multidimensionality of trust and distrust	Trust and distrust are composed of many subconstructs and dispositional antecedent constructs (McKnight <i>et al.</i> , 2004; McKnight & Choudhury, 2006). Further, it is not about trusting a trustee in all situations, but trust is between two people regarding a specific behavior (Lewicki <i>et al.</i> , 2006).	Empirical support found in (McKnight <i>et al.</i> , 2004; McKnight & Choudhury, 2006).
Conflicts between trust and distrust	Although trust and distrust are proposed to exist, current models do not explain or predict ambivalence from possible conflicts between them (Dimoka, 2010).	Not investigated empirically within the IS trust-distrust literature. Ambivalence literature shows that coexistence of opposite valenced attitudes may result in ambivalence (Kaplan, 1972).
Conflicts within the same subconstruct	Models propose and measure the concurrent positive and negative attitude toward the trustee on the same dimension. The truster holds both a positive and a negative valence belief of the same subconstruct (McKnight <i>et al.</i> , 2004; McKnight & Choudhury, 2006).	Not investigated empirically within the IS trust-distrust literature. Empirical work on trust and distrust has found that although they coexist, they do not coexist within the same subconstruct (Cacioppo & Bernston, 1994; Priester <i>et al.</i> , 2007; van Harreveld <i>et al.</i> , 2009). This is further proposed and described as a basic underlying feature of bidimensional models in the attitude and ambivalence literature.

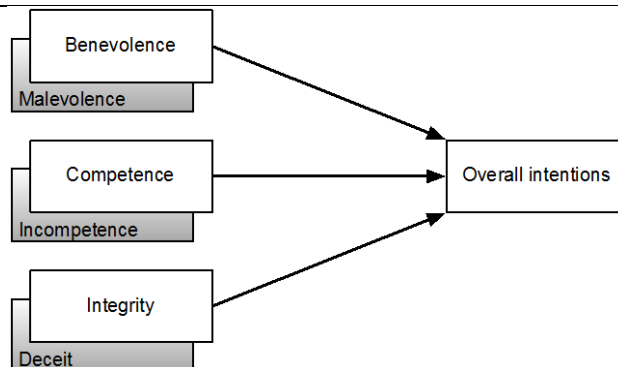


Figure 1 Proposed hybrid conceptualisation of overall trust-based beliefs

Third, building on the unidimensional approach, we propose that although trust and distrust can coexist, only one instantiation (*e.g.*, competence or incompetence) can exist for each specific, independent

belief subdimension, which may include a wide variety of specific beliefs for each of these subdimensions when an intention is formed by the truster. For instance, errors can be made in packaging, addressing, billing or many other details of an online order. Such errors could then create their own respective beliefs. We assume that even one major shortcoming can affect a consumer's judgment of overall competence in a negative way. Even if a vendor packages the correct item, sends it to the right address and uses the agreed-upon shipping method, these competent acts will not make up for an item arriving broken because of careless packaging. That is, we do not postulate that a consumer would conceptualise that the vendor was "mostly" correct by demonstrating three competent acts and one incompetent act. Consequently, the seriousness or pervasiveness of a single incompetent act will affect the magnitude of the consumer's overall judgment of competence due to its salience. Consistent with the work of Gefen (2002) and Simon (1957, 1991), the alternative would be to store, periodically process and keep salient a notion of competence regarding each individual step in the shipping process, which would be a needlessly wasteful process. Thus, when forming the final trusting or distrusting intention, depending on the direction of the intention, the truster will recall all relevant beliefs, and the subdimensions will be assessed and result in either a positive or negative assessment for the trustee's ability, orientation and dependability. These judgements, based on the beliefs are used to create the overall intention.

We believe that this same property holds for each subdimension. If a seller deceives the buyer and charges his or her credit card for twice the advertised price, the seller would not be thought to "mostly" have integrity, even if the seller shipped the expected SKU, quantity, and condition. Likewise, providing several caring communications during the sale will not be salient if the consumer encounters hostile service or support afterwards.

We assume that it is most likely that consumers form summary judgments for each of the three trusting belief dimensions, simplifying the contradictory information that underlies the dimensions. Thus, the weakest link in each trusting belief dimension will negatively anchor the person's overall judgment for the dimension in general. Besides conserving effort in storing and processing information, a summary or 'net' judgment leads more directly to a dichotomous attitude of whether or not to trust an organisation and engage in trust-related behaviours (*e.g.*, joining an online community, sharing information or experiences or purchasing a product). Ultimately, the trusting or distrusting intention is formed by considering the various trusting and distrusting beliefs, which are stored in memory.

We propose that the truster who is engaging in the transaction may believe *or perceive* that the trustee has provided inconsistent or contradictory signals. The truster needs to process those contradictory signals to result in a single behavioural response (*i.e.*, buy or not buy), and it has been unclear in our reading of the literature how or when this processing takes place. We propose that during the online shopping experience it is possible that contradictory signals are perceived, stored, and processed in

greater detail than a single summary impression would imply. These signals could result in positive and negative beliefs, which may engender ambivalence. Current research in e-commerce is scant on ambivalence and thus we seek to further understand how it is created and how it impacts the trust-distrust relationship between the buyer and seller in online markets.

Methodologies

Prior to actual data collection, anomalous cues to be used in the study were generated and tested with two pilot studies to ascertain the following: (1) the expected buying process that a consumer needed to complete to purchase an item from an online vendor and (2) cues, signals, and errors on a website that would foment feelings of distrust from an online consumer.

Pilot 1. Verification of a ‘Normal’ Online Shopping Process

The first pilot ascertained the expected buying process that a consumer would experience when purchasing a product online from a vendor. Forty graduate students in an e-commerce course with extensive online shopping experience from a private university located in the northeastern United States were invited to participate in the pilot study; 20 volunteered (response rate=50%).

Participants were asked to provide responses to the following open-ended question regarding a typical online transaction: ‘List the steps that you would expect to follow in a typical online transaction’. Participants were able to freely respond to this question and submit their responses through an online survey tool. Two coders familiar with online shopping categorised data separately. After initial coding, the coders compared their results and discussed each discrepancy until they could agree on the categorisation. Initial inter-rater reliability was 95%. The coded responses were counted and categorised. Items with high counts represented aspects of the buying process which buyers expected to experience. Table 3 summarises the expected steps in an online buying episode.

Table 3 Expected Shopping-Scenario Process

<i>Category</i>	<i>Examples</i>	<i>Count</i>
Item selection	‘Search/browse items’, ‘Browse the goods’	14
Add to cart	‘Click on buy’, ‘Check out’	10
Create an account	‘Create a username and password’, ‘Login’	6
Begin transaction	‘Make purchase’, ‘Make the transaction’	13
Enter order/billing information	‘Enter credit card and shipping info’, ‘Decide payment info’	15
Review purchase/invoice	‘Review order confirmation’, ‘Confirm the purchase’	13
Confidentiality	‘Expect confidentiality’	2
Seller follow-through	‘Receive an e-mail’	4

The Table 3 categorisations indicate the general online consumer expects that a product should first be described on the company’s webpage. Next, a consumer enters information required to ship the item, and purchasing information is requested. Finally, a confirmation page is displayed summarising the order. If it is correct, the consumer submits the order and is shown an invoice or receipt. Given these expectations, we used this process in the creation of treatment scenarios for final data collection.

Pilot 2. Abnormal Features on Online Shopping Websites

Having established the expected store process, we then sought to discover good examples of unexpected, abnormal features of online transactions that trigger distrust. These features would then serve as abnormality cues in the full experiment. We also modified and validated customer reviews of online merchants for use as customer ratings in the final data collection.

We invited 74 students^x to identify abnormal features, signals, cues and errors during online transactions to test the study's created scenarios; 44 individuals participated (response rate=59.5%). They were asked to identify cues and signals that would cause to distrust an online seller given atypical or abnormal features on a website. We used the following prompts based on the tripartite view of beliefs (Bagozzi *et al.*, 1979):

- How would you describe your feelings about a trustworthy online merchant?
- What key characteristics do you believe are shared by trustworthy online merchants?
- How would you behave when interacting with a trustworthy online merchant?
- How would you describe your feelings about an untrustworthy online merchant?
- What key characteristics do you believe are shared by untrustworthy online merchants?
- How would you behave when interacting with an untrustworthy online merchant?

The same two coders also coded these data, producing a similar level of inter-rater reliability (96%). Based on the key characteristics of trustworthy and untrustworthy vendors, Table 4 reports the categorised list of cues or signals that would typically be considered abnormal and thus trigger distrust.

Table 4 Expected Shopping-Scenario Process

<i>Category</i>	<i>Examples</i>	<i>Count</i>
Known deceitfulness	'Bad review', 'Word of mouth'	7
Unusual information	'Unusual question', 'Incorrect product information'	5
Poor design	'Poor website design', 'Contradictory information'	12
Missing information	'Limited or no information', 'Unclear representations'	9
Abnormal pricing	'Too good to be true', 'Extremely different price'	5
Insecure	'Lax security standards', 'Missing security components'	13
Small/unknown seller	'Smaller company', 'No reviews'	2

We also presented to the participants the proposed customer reviews to be used in the experiment to manipulate the perceived ability, orientation and dependability of the online seller. They were based on actual reviews from Amazon.com and modified for our context. The feedback of these customer reviews provided support (100% in favour) that such reviews were entirely believable and true. The participants also made some minor suggestions regarding specific wording in some of the reviews, which we found useful in developing the final materials.

Final Data Collection

Participants were recruited to participate in a free-simulation experiment. This methodology is similar to experimental simulation in that, in both cases, the researcher designs a realistic but closed setting and

measures the response of human subjects as they interact within such a system. However, in the free-simulation experiment, events and their timing are determined by both the researcher and the behaviour of the human subject. This is particularly useful for increasing realism in website experimentation, such as that for this study, because the user chooses to interact and ‘surf’ with the experimental website in a naturalistic manner, as seen in various other studies (Gefen *et al.*, 2003; Vance, 2008; Lowry *et al.*, 2012). This study’s free-simulation experiment consisted of various treatments for buying a commodity, a low-cost consumer good (*i.e.*, an 8-pack of AA batteries). All participants viewed a product information page, a page that reviewed the seller, an order entry page and a final summary or invoice of the staged, experimental purchase. Participants were randomly assigned to one of three basic types of treatment scenarios, some with several variations, to increase the variations of trust, distrust and ambivalence within the dataset. These scenario types are as follows:

1. **Control or trusting treatment** (see Online Appendix 2 for screenshots): The entire buying process proceeded without any intentional signals meant to increase distrust or ambivalence;
2. **Distrusting treatments** (see Tables A1.2–A1.5 for screenshots): The entire buying process contained several errors and anomalous cues that were meant to increase distrusting beliefs.
3. **Ambivalence treatments** (see Tables A1.6–A1.8 for screenshots): The entire buying process contained roughly one third of the number of distrusting cues as the trusting treatments in an effort to evoke distrusting and trusting beliefs, increasing the likelihood for ambivalence.

Table 5 summarises the design manipulations explored and validated in the pilot study that were included in the treatments. Specifically, each treatment consisted of a varying portfolio of the available design treatments that were identified in the second pilot study.

Table 5 Summary of Experimental Treatments by Portfolio of Design Manipulations

<i>Design manipulation</i>		<i>Treatment goal and number</i>							
		<i>Trust</i>				<i>Ambivalence</i>			
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
Price	High		X			X		X	X
	Normal	X					X		
Site look and feel	Low			X	X				
	Consistent	X		X	X		X		
Customer ratings	Inconsistent		X			X			
	None		X						
Information requested	Normal	X				X	X		
	Additional info requested			X	X			X	X
	Targeted dimension			I	M	D	D	I	M
Presentational errors	None	X						X	X
	Wrong product picture		X			X	X		
	Wrong product description		X			X			
	Missing product description			X	X				
	Misspellings		X	X	X		X		

Key: I=incompetence (negative ability); M=Malevolence (negative orientation); D=Deceit (negative dependability)

Participants

For the main study, 521 participants were recruited from both introductory psychology and information systems courses at a large public eastern university in the United States^{xi}. Eight participants provided unusable or missing data, which were subsequently deleted from the dataset, resulting in an actual sample size of 513. The sample consisted of 280 males (55.7%) and 223 females (44.3%) with the average age of 20.9 years (SD=3.2 years). The average education level of the participants was 2.1 years of college (SD=1.3 years).

Task, Procedures and Controls

Participants were asked to imagine that they were buyers of a battery pack, to review various screenshots and to respond to several questions concerning their expected attitudes and intentions when making such a purchase. The sequence of events included viewing product pages, customer reviews, order summaries, billing information and shipping information.

The main page for the product contained an item picture, price and description as they conventionally appear online. An overall view of the page was presented, and then additional zoomed-in portions of the page were provided to ensure that participants were familiar with the product description, price and seller information. Customer reviews and ratings were also displayed, along with several comments from previous customers such as those commonly found on Amazon.com. Portions of the customer ratings were extracted and enlarged to increase the likelihood of participants' familiarity with those portions of the page. Participants were then shown a buyer's information page that requested personal and shipping information, a page in which buyers entered credit card and billing information and a product confirmation page that summarised the order along with price, shipping and billing information. After participants reviewed their randomly assigned buying scenario, they completed instruments to measure the constructs in the model (see Appendix 1).

Analysis and Results

Extensive pre-analysis and data validation were conducted according to the latest standards to accomplish four goals, as follows (see Appendix 3) (e.g., Gefen & Straub, 2005; Cenfetelli & Bassellier, 2009; Lowry & Gaskin, 2014): (1) to establish factorial validity, (2) to establish that multicollinearity was not a problem with any of the measures, (3) to establish strong reliabilities and (4) to check for common-method bias. To establish factorial validity, we used partial least-squares (PLS) structural equation modelling (SEM), which has been used similarly in other behavioural research for strong factorial validity validation (e.g., Howell & Hall-Merenda, 1999; McCormack *et al.*, 2009). Because all constructs were reflective^{xii}, we established reliability by applying the two most conservative criteria – both the composite reliability and the Cronbach's α coefficients should be ≥ 0.7 (Fornell & Larcker, 1981; Nunnally & Bernstein, 1994). Table 6 summarises these values, which indicate acceptable reliabilities.

Table 6 Reliability Results for Reflective Subconstructs

<i>Construct</i>	<i>Subconstruct</i>	<i>Composite reliability</i>	<i>Cronbach's alpha (α)</i>
Ambivalence	n/a	0.820	0.789
Distrusting beliefs	Malevolence	0.911	0.853
	Incompetence	0.945	0.921
	Deceit	0.955	0.937
Trusting beliefs	Benevolence	0.911	0.853
	Competence	0.936	0.907
	Integrity	0.944	0.920
Trusting intentions	Follow advice	0.942	0.922
	Give information	0.743	0.686
	Make purchase	0.867	0.701
	Willing to disclose information	0.931	0.900

The reflective constructs exhibit strong factorial validity and reliability and a lack of mono-method bias. These results show that the dataset meets or exceeds the rigorous validation standards expected in behavioural research, particularly for PLS analysis (Diamantopoulos & Winklhofer, 2001; Podsakoff *et al.*, 2003; Straub *et al.*, 2004; Gefen & Straub, 2005; MacKenzie *et al.*, 2011; Lowry & Gaskin, 2014). We note that the constructs are not as highly divergent as is often found in IS research. This is due to the fact that trust and distrust subdimensions are not unrelated constructs; rather, they have the same underlying core meanings in their respective definitions. Despite their similarities, we do find them to be divergent enough, and have their own differential impacts. Further, we note that their correlations are less than .90, which is identified as the threshold for constructs that are too highly correlated (Pavlou *et al.*, 2007).

Next, we tested the fit of the data within the covariance-based SEM STATA 12.1SE. Unlike PLS-based data confirmation for convergent and divergent validity, the model was assessed using fit indices. Unlike in the PLS model, we included only first-order reflective constructs. Second-order formative constructs were avoided to avoid the identification problem that often results when creating second-order formative constructs in a covariance-based SEM (Kenny & Milan, 2011). All subdimensions of the second-order formative constructs were thus directly associated with all first-order dimensions of related constructs in the theoretical model. The fit indices indicated an adequate model fit, especially given the established nature of the theoretical model ($\chi^2_{56}=4381.22$, $p=0.000$; RMSEA=0.108; CFI=0.972; TLI=0.951; SRMR=0.032; CD=1.000).

Manipulation Checks

Two approaches were used for manipulation checks: (1) in the post-test survey, we asked the participants if they noticed the manipulations and (2) we tested to see if the treatments provided the desired effects. Appendix 3 provides full details for these checks, which are summarised here. The manipulation check ascertained whether the participants had noticed the process abnormalities, website design abnormalities and informational abnormalities. Most participants were aware of the manipulations, but a substantial portion of the manipulations were not perceived or remembered by the participants. Nevertheless, these

data were retained because they provide a more realistic test of the data (Straub *et al.*, 2004).

Given that large portions of the participant sample were not aware of specific manipulations, this study also relied upon mean comparisons between treatment groups to assess the effectiveness of the manipulations. We conducted several rounds of comparative analyses to establish whether the treatments mainly worked in the directions intended, using polynomial regression analysis (PRA).

Robustness Check

We performed all of the analyses in the paper after dropping all subjects who did not perceived the manipulations within the experiment. We find that all results are within 4% of the full dataset. Further, we tested whether these differences were statistically significant and found that all such differences were insignificant. We thus assert that the failure to perceive the manipulations did not alter our results.

Polynomial Regression Analysis

We used STATA 12.1SE to conduct PRA. After fitting the data to the theoretical model, the extracted scores for each of the first-order reflective constructs based upon the factor scores were extracted from the model estimation, resulting in one score for each subdimension, or 13 latent construct variables. Table 7 summarises the descriptive statistics for these constructs. PRA involves three steps: 1) showing a direct regression of the belief subdimensions on overall intentions and the differences between these subdimensions; 2) a regression of the combined dimensions (ability, orientation and dependability) on overall intentions; and 3) a full factored regression of subdimensions (see equation 1) on overall intentions. We describe each of these steps below.

Table 7 Descriptive Statistics of Extracted Latent Construct Scores

<i>Construct</i>	<i>Subconstruct</i>	<i>Mean</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
Ambivalence	n/a	0.057	1.006	-2.244	2.245
Distrusting beliefs	Malevolence	0.002	0.735	-1.470	1.381
	Incompetence	0.019	0.898	-1.546	1.446
	Deceit	0.015	0.849	-1.596	1.429
Trusting beliefs	Benevolence	-0.005	0.594	-0.809	2.002
	Competence	-0.242	0.689	-1.013	1.856
	Integrity	0.035	1.577	-3.308	2.453
Trusting intentions	Follow advice	0.038	1.082	-2.429	1.994
	Give information	0.007	1.152	-2.630	2.830
	Make purchase	0.004	1.043	-2.128	1.779
	Willing to disclose information	0.044	1.332	-3.559	2.312
	General	4.470	1.148	1.727	7.000

We now demonstrate how PRA can provide a richer understanding of trust and distrust and their joint effects on trusting intentions and ambivalence (Klein *et al.*, 2009) in three steps. First, we show the results of the unidimensional view of trust by regressing the results for the three trust dimensions. We then compare the predictive power of these results to that of the model produced by including distinct distrust dimensions. Finally, we compare this bidimensional view of trust and distrust to the PRA of trust and distrust, which accounts for the joint effects that occur when both trust and distrust are present.

The first step, computing difference scores between the three trust–distrust dimensions (ability, competence–incompetence; orientation, benevolence–malevolence; and dependability, integrity–deceit), examines the dimensional approach to assessing trust and distrust. We regressed these variables onto trusting intentions and ambivalence. Table 8 summarises these results, which indicate that this model is highly predictive of both trust and ambivalence. Further, with the exception of honesty, the dimensions are significant predictors of both trust and ambivalence.

Table 8 Results of Difference Scores Regressed on Trusting Intentions and Ambivalence

<i>Variable</i>	<i>Trusting intentions (general)</i>			<i>Ambivalence</i>		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Ability	-0.480	11.95	0.000	-0.211	3.21	0.001
Orientation	-0.198	4.07	0.000	0.162	2.03	0.043
Honesty	-0.072	1.36	0.176	-0.139	1.58	0.114
Constant	4.445	173.64	0.000	0.004	1.05	0.296
R²	0.740	500.28	0.000	0.109	20.82	0.000

The second step was to model the subdimensions as separate components, reflecting the bidimensional view of trust and distrust. These results show how the subdimensions of trust and distrust regress onto trusting intentions in general and ambivalence. Again, we note that most of the antecedents are significant predictors of the dependent variables for trust, but not for ambivalence, in which only incompetence is found to significantly predict ambivalence. Table 9 details these regression results. Comparing the adjusted R² scores from the difference score model (Table 8) to the separate-component-scores model (Table 9), slight improvements are observed, which are significant based on the Chow test (Δ Adj. R²_{trusting intentions}=0.007, F=4.56, p=0.000; Δ Adj. R²_{Ambivalence}=0.010, F=2.194, p=0.041). These results indicate that the bidimensional view of trust and distrust more accurately reflects the underlying data. Further, the effects of the dimensions are more highly varied in the bidimensional model, which reflects how opposing trust and distrust subdimensions produce differential impacts on both overall trusting intentions and ambivalence. Further, the effects of the distrust subdimensions tend to be stronger on the dependent variable, as indicated by the larger beta coefficients in the respective models.

Table 9 Results of Separate Component Scores Regressed on Trusting Intentions and Ambivalence

<i>Variable</i>	<i>Trusting intentions (general)</i>			<i>Ambivalence</i>		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Competence	0.437	5.59	0.000	0.207	1.61	0.107
Integrity	0.141	1.50	0.133	0.091	0.59	0.554
Benevolence	0.173	2.13	0.034	0.208	1.56	0.120
Incompetence	-0.507	8.53	0.000	-0.207	2.12	0.035
Deceit	-0.026	0.34	0.734	-0.169	1.35	0.176
Malevolence	-0.220	3.03	0.003	-0.113	0.95	0.342
Constant	4.445	173.24	0.000	0.045	1.06	0.290
R²	0.747	249.25	0.000	0.119	10.59	0.000

Given that the separate components for trust and distrust had a significant predictive improvement for both trusting intentions and ambivalence, we then took the third step of conducting PRA analysis for each trust dimension. Notably, it is important to perform the prior steps, because they show that the additional variables within the model are in fact significant, improving the predictability of the model. If either of these conditions fails, it is unlikely that a PRA-based model will produce results that are both more highly predictive of the data and demonstrative of the differential impacts found by the opposing constructs (Klein *et al.*, 2009).

To perform a PRA, the opposing dimensions are included, along with the squared and interactive terms for both of these dimensions. We do this for all of the included dimensions within the model (*i.e.*, competence–incompetence, benevolence–malevolence and integrity–deceit). The following is an example of using PRA equation (1) for the trust–distrust ability (competence–incompetence) dimension:

$$\text{Trusting Intentions} = b_0 + b_1\text{Competence} + b_2\text{Incompetence} + b_3\text{Competence}^2 + b_4\text{Competence*Incompetence} + b_5\text{Incompetence}^2 + e. \quad (1)$$

Table 10 summarises the results of the PRA for each trust dimension on overall trusting intentions and ambivalence. The preponderance of the terms, including many of the interactive and higher-order ones, are significant, which indicates the benefit of this analysis in understanding these complex relationships. Comparing the adjusted R² scores from the separate components model to this one, we again see slight improvements which are significant based on the Chow test ($\Delta \text{Adj. R}^2_{\text{trusting intentions}}=0.014$, $F=2.905$, $p=0.002$; $\Delta \text{Adj. R}^2_{\text{Ambivalence}}=0.223$, $F=16.810$, $p=0.000$). Further, an analysis of the results shows that several of the nonlinear coefficients are significant, with moderate-to-large effect sizes. This supports the proposition of our research that the relationship between trust and distrust is quite complex, and therefore better analysed with PRA, which also produces better predictive power for the model. The results of these analyses can then be used to understand the complex interactions of the various subdimensions of trust and distrust in general trusting intentions and ambivalence.

Response Surface Analysis

Given that the nature of the PRA for each trust dimension includes two higher-order terms and an interaction term, the suggested method for understanding the relationship is to rely on RSA for graphical depiction of the results, alongside important pivotal points within the relationship that provide a more in-depth understanding regarding its complexity (Edwards, 2002). RSA was developed to understand complex higher-order relationships and interactions among multiple variables, graphically and mathematically. We explain these results in more detail in the discussion section.

MYSTAT version 12 was used to create response surfaces for each of the trust dimensions with both overall trusting intentions and ambivalence. The response surfaces are based on the regression results obtained from the PRA for each of the two dependent variables (z), with the trust-based side of the

Table 10 Results of PRA by Trust Dimension

<i>Variable</i>	<i>Trusting intentions (general)</i>			<i>Ambivalence</i>		
	β	<i>t</i>	<i>p</i>	β	<i>t</i>	<i>p</i>
Competence	0.487	5.93	0.000	0.109	-0.91	0.361
Incompetence	-0.495	8.35	0.000	-0.188	2.19	0.029
Competence ²	0.079	1.07	0.287	-0.154	-1.43	0.155
Incompetence ²	0.205	3.43	0.001	-0.302	-3.49	0.001
Competence*Incompetence	0.161	1.73	0.084	0.057	0.42	0.674
Integrity	0.141	1.40	0.161	0.074	-0.51	0.612
Deceit	-0.027	0.35	0.724	-0.025	0.23	0.822
Integrity ²	-0.067	0.71	0.478	0.106	0.78	0.437
Deceit ²	-0.249	3.52	0.000	-0.102	-0.99	0.322
Integrity*Deceit	-0.300	2.56	0.011	0.258	1.51	0.131
Benevolence	0.199	2.27	0.023	0.176	1.39	0.166
Malevolence	-0.197	2.67	0.008	-0.081	0.76	0.450
Benevolence ²	0.134	1.57	0.118	-0.013	-0.11	0.916
Malevolence ²	0.147	1.97	0.050	0.019	0.18	0.859
Benevolence*Malevolence	0.296	2.50	0.013	0.066	0.39	0.699
Constant	4.351	104.76	0.000	0.523	8.67	0.000
R²	0.761	105.32	0.000	0.342	17.24	0.000

continuum assigned as the *x* variable and the distrust-based side assigned as the *y* variable. Figure 2 depicts the response surface graphs for overall trusting intentions^{xiii}, while Figure 3 depicts ambivalence.

There are three basic types of figures for response surfaces, namely concave (dome-shaped); convex (bowl-shaped); and saddle, which combines upward and downward curves to produce a saddle-like shape. All of the shapes for the trust dimensions for overall trusting intentions appear as concave (integrity–deceit) or convex (competence–incompetence, benevolence–malevolence). The response surfaces for the trusting dimensions for ambivalence appear as concave (competence–incompetence) or saddle shaped (integrity–deceit, benevolence–malevolence).

Edwards (2002) recommended that the response surfaces can be better understood by analysing the stationary points and varying axes that pinpoint interesting aspects of the surfaces. The stationary point reflects the point on the surface for which the slope in all directions is zero. Thus for the concave or convex surfaces, the stationary point identifies the maximum and minimum points, respectively, while it represents the intersection of the upward and downward curves for the saddle shape. We followed the equations in Edwards (2002) and summarise them in Table 11 to calculate these coordinates and lines of interest related to the response surface.

The principle axes help to determine the shape and direction of the slopes for each of the response surfaces. Each is perpendicular to the others, and passes through the stationary point. The first principle axis describes the overall surface orientation in relation to the XY coordinate plane; the second principle axis defines the major surface plane. Each axis provides additional insight, given the nature of the surface in which it is found. For the concave response surface, the primary axis is the line along which the

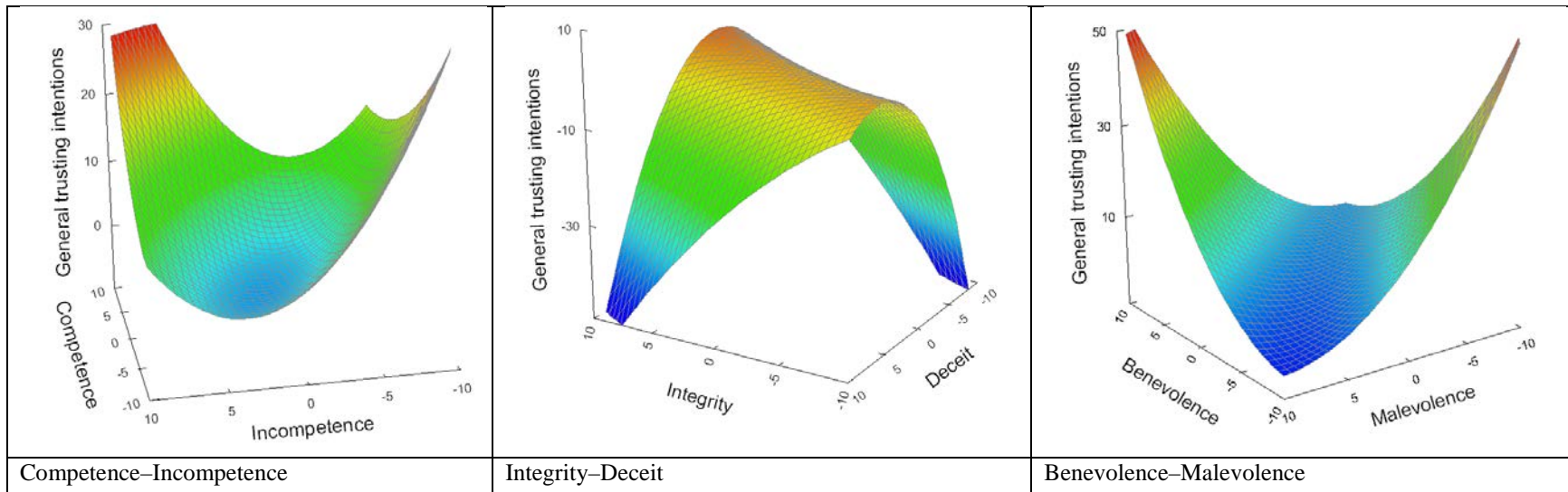


Figure 2 Response surfaces for trust dimensions on overall trusting intentions

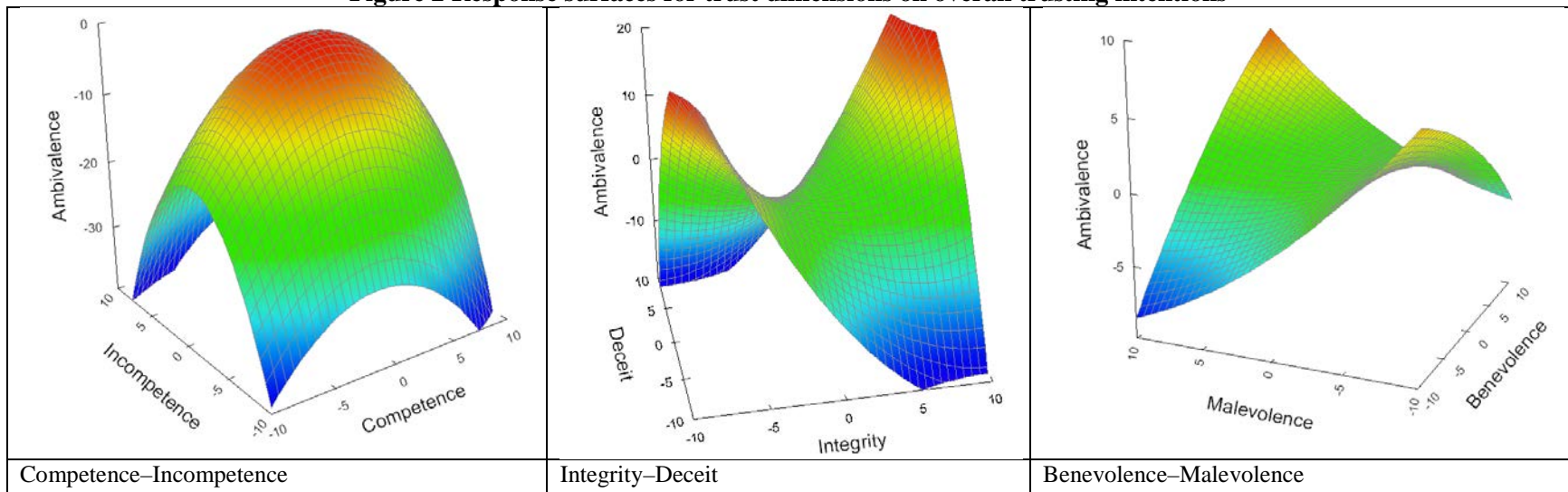


Figure 3 Response surfaces for trust dimensions on ambivalence

Table 11 Key Metrics for Response Surfaces

Variable	Competence–incompetence		Integrity–deceit		Benevolence–malevolence		
<i>Stationary points</i>							
$X_0=(b_2b_4-2b_1b_5)/(4b_3b_5-b_4^2)$			$Y_0=(b_1b_4-2b_2b_3)/(4b_3b_5-b_4^2)$				
	X	Y	X	Y	X	Y	
Trust	7.187	-4.040	3.292	-1.932	-13.533	12.945	
Ambivalence	-0.302	0.283	0.079	0.222	0.259	-2.552	
<i>First principal axis</i>							
$Y=p_{10} + p_{11}X$			$p_{11}=(b_5 + b_3 + ((b_3-b_5)^2 + b_4^2)^{1/2})/b_4$				
$p_{10}= Y_0 - p_{11}X$							
	P10	P11	P10	P11	P10	P11	
Trust	-25.797	3.027	-1.541	-0.119	39.352	1.951	
Ambivalence	-1.290	-5.210	0.120	1.302	-2.864	1.204	
<i>Second principal axis</i>							
$Y = p_{20} + p_{21}X$			$p_{21} = (b_5 - b_3 - ((b_3-b_5)^2 + b_4^2)^{1/2})/b_4$				
$P_{20} = Y_0 - p_{21}X$							
	P20	P21	P20	P21	P20	P21	
Trust	-0.525	-0.489	-7.778	1.776	-0.011	-0.957	
Ambivalence	-1.343	-5.386	0.386	-2.093	-2.390	-0.626	
<i>Slopes and curvature</i>							
		<i>Slope</i>	<i>Curvature</i>	<i>Slope</i>	<i>Curvature</i>	<i>Slope</i>	<i>Curvature</i>
Y = X line	Trust	0.008	0.445	-0.114	-0.615	-0.002	0.576
	Ambiv.	0.079	-0.399	-0.049	0.262	0.257	0.073
Y = -X line	Trust	-0.982	-0.287	-0.168	0.482	-0.396	-0.308
	Ambiv.	-0.298	0.091	-0.099	-0.050	0.096	-0.099
1 st Axis	Trust	-35.105	2.442	0.228	-0.035	34.372	1.270
	Ambiv.	-5.226	-8.656	-0.042	0.269	-0.049	0.095
2 nd Axis	Trust	-0.300	0.049	-25.391	-1.384	-0.371	-0.014
	Ambiv.	13.263	-9.229	-1.643	-0.880	2.958	-0.047

Note: Betas for the equation calculations are based on the beta positions in Equation 1, in the methodology section.

P₁₀: intercept of the first principle axis

P₁₁: slope of the first principle axis

P₂₀: intercept of the second principle axis

P₂₁: slope of the second principle axis

Slope: the slope of the surface along the line at X=0

Curvature: the curvature of the surface along the indicated line

downward curvature of the surface is minimised; the secondary axis is the line along which the downward curvature is maximised. For the convex response surface, the principle axis is the line along which the upward curvature is maximised; the secondary axis is the line along which the downward curvature is minimised. For the saddle-shaped response surface, the principle axis is the line along which the upward curvature is maximised; the secondary axis is the line along which the downward curvature is maximised.

Discussion

Much research has focussed on the critical roles that trust and distrust play in the success of online transactions. Yet, the relationship between them has been the subject of substantial theoretical debate. Further adding to the potential complexity of the trust–distrust relationship is the creation of ambivalence, which has not been examined in online transactions and relationships (Jarvenpaa & Majchrzak, 2010). Unfortunately, current models of trust and distrust have limitations which impede their ability to explain

how, or even if, ambivalence is generated by trust and distrust, and how these two constructs can best coexist. We thus propose a hybrid model of trust–distrust that addresses the limitations and strengths of previous models. Trust and distrust can in fact coexist as separate components, but with related continua. Inspired by Klein *et al.*'s (2009) call for behavioural researchers to better test and understand complex constructs using more appropriate analysis techniques such as PRA, we use PRA and RSA to better investigate these complex relationships.

Given the complexity of the difference-scores regression, PRA and related response surfaces, we first briefly interpret the results of the analysis reported in the previous section, summarise the theoretical and methodological contributions of this work and conclude by discussing the limitations and implications for future research. Given the complexity of these various analyses and findings, we summarize all of our results in our last section. Table 12 summarises all of our analyses, by constructs. As far as we know, each of the findings that we report here have not been reported in prior research, because this is the first attempt to examine the joint and interactive effects of the trust and distrust subdimensions when forming trust, distrust and ambivalence.

Summary of the Results of Difference Scores and PRA

Table 8 reports the analysis of the difference scores based on the assumption that trust and distrust occupy opposite ends of the same single continuum. The difference scores were effective in predicting overall trusting intentions, and weakly predicted ambivalence. However, the analysis of the separate components – based on the assumption that trust represents a distinct continuum apart from distrust – revealed that overall trusting intentions and ambivalence were significantly more predictable than the difference scores (see Table 9). Hence, by separating trust from distrust, the predictive power of the models increased. This empirical evidence provides further support for the notion that trust and distrust are most likely separate components rather than opposite ends of the same spectrum.

We then analysed the same models with PRA, under the assumption that distrust and trust lie upon separate but related continua (see Table 10). This analysis revealed that the higher-order and interactive terms introduced from the PRA equation significantly increased the predictive power of both models, particularly the ambivalence model, which increased explained variance by 287%. The findings reported in Table 11 support this study's research objective of exploring the relationship between trust and distrust on overall trusting intentions and ambivalence. We show that the relationship between the two constructs is likely more complicated than reported in extant trust–distrust literature. Our analyses support the conclusion that trust and distrust cannot be simply pitted against each other; rather, it is important to consider their elements and how they jointly affect trusting intentions and ambivalence. The canonical correlations show that they have about 70% shared variance, but 30% distinctness between them, which supports the assumption that distrust and trust lie on separable but related continua.

Table 12 Summary of Analyses and Findings by Construct

<i>Construct</i>	<i>Outcome</i>	<i>Meth</i>	<i>Finding</i>
Benevolence	Positive influence on trust	PRA	Moderate influence on the creation of trust—equal impact as malevolence.
	Positive influence on trust	RSA	Largest influence on the generation of trust, with equal and large amounts of benevolence and malevolence (positive or negative).
	Positive influence on ambivalence	RSA	Can moderately create ambivalence with high amounts of benevolence and malevolence. Somewhat less ambivalence is created with negative, equal amounts of the two constructs
Benevolence & malevolence	Interactive trust influence	PRA	The two orientation subdimensions interact and have a medium large effect on trust. Given their equal influence on trust, this creates the extensive trough in the RSA, and the higher potential for trust instantiation.
	Inability to detract from trust Potential for ambivalence	RSA RSA	Analysis reveals that the lowest point on the response surface will only minimally reduce trust. High positive levels of benevolence and malevolence results in low levels of ambivalence; however, negative extremes of the two subdimensions results in minimal levels of ambivalence.
Malevolence	Negative influence on trust	PRA	Moderate influence on the creation of trust—equal impact as benevolence.
	Higher order trust effect	PRA	Binomial term for malevolence is shown to exert a moderately weak influence on trust.
	Positive influence on trust	RSA	Like benevolence, malevolence has the greatest potential for creating trust with equal amounts of benevolence.
	Weak ambivalence effect	RSA	Response surface reveals that malevolence is minimally able to increase or decrease ambivalence.
Competence	Positive influence on trust	PRA RSA	Large effect on the generation of trust—greater impact on trust than incompetence.
	Positive influence on trust	RSA	Greatest amounts of trust result from high competence and moderate incompetence.
	Positive influence on trust	RSA	Moderately large effect on the generation of trust.
Competence & incompetence	Inability to detract from trust	RSA	Analysis reveals that the lowest point on the response surface will only minimally reduce trust.
	Detrimental potential on ambivalence	RSA	Both ability subdimensions are shown to have no potential for the generation of ambivalence, but potentially reducing ambivalence when either subdimension reaches a high magnitude.
Incompetence	Negative influence on trust	PRA	Large influence on the generation of trust—less impactful than competence.
	Higher-order trust effect	PRA	Binomial term for incompetence is shown to exert a medium influence on trust.
	Negative ambivalence effect	PRA	Medium effect on the generation of ambivalence.
	Higher-order influence on ambivalence	PRA	Binomial term for incompetence is shown to exert a medium effect on ambivalence.
	Best predictor of ambivalence	PRA	Incompetence, with its direct and binomial term, is shown to be the best predictor of ambivalence.
	Positive influence on trust	RSA	Incompetence is shown to positively influence trust when it is extreme; moderately positive amounts of incompetence result in lowest levels of trust.
Integrity	Negligible influence on trust	PRA	Integrity is not shown to positively influence trust.
Integrity & deceit	Detrimental influence on trust	RSA	Integrity is shown to have a negative effect on trust when it is of high magnitude, and deceit is of equal magnitude.
	Potential for ambivalence	RSA	High positive levels of integrity and deceit results in moderate levels of ambivalence, however negative extremes of the two subdimensions results in moderately weak levels of ambivalence.
	Interactive effect on trust	PRA RSA	The two honesty subdimensions interact and have a medium large effect on trust. Given the significant deceit binomial the response surface shows that the interaction creates a large potential for deterring trust, rather than positively affecting trust.
Deceit	Higher-order influence on trust	PRA	Binomial term for deceit is shown to exert a medium effect on ambivalence. Response surface reveals that this term reverses the direction of the equation, thus producing a maximum potential for trust at a low level.
		RSA	

Explaining the Results of the RSA

This section will briefly explain the results of the RSA, based on PRA, to provide a better understanding of the relationship of trust with distrust and their joint effects on overall trusting intentions and ambivalence. Here, we are able to highlight more precisely how trust and distrust components interact, which has not been shown in any previous study.

Overall trusting intention results from the RSA. First, the effects of competence and incompetence on overall trusting intentions are more complex than has been found previously. Conceptualisations of trust have focussed on trust as precipitated when overall trust is high or distrust is low. The response surface supports those assumptions, but also demonstrates that moderately high levels of trust can be achieved when competence is high, regardless of the level of incompetence. This finding indicates that incompetence has only weak effects on trusting intentions, and only if the competence of the seller is low. Interestingly, the stationary point reveals that the lowest point on the surface is a moderately high level of incompetence (7.187) and a moderately low level of competence (-4.040). This indicates that the combination of competence that is likely to result in the lowest levels of trust is moderately high levels of incompetence paired with low levels of competence. Even higher levels of incompetence of competence result in higher amounts of trust. This finding has not been reported in the extant literature on trust and distrust.

We also report that trust is more likely to be highly instantiated when competence and incompetence are not of equal magnitudes. Our results reveal that high competence and low incompetence equally arouse high trust alongside high incompetence and low competence. This result is puzzling, but highlights that the participants were more likely to trust when either competence or incompetence was clearly of a greater magnitude than its opposing subdimension. Further, given the slopes of the principle and secondary axis for this analysis, we reveal that the effects of each subdimension are relatively equal in predicting trust.

The impact of competence and incompetence on ambivalence is even more revealing. We report that the potential for creating ambivalence is relatively negligible for these dimensions. The highest level of ambivalence from these subdimensions is still less than zero. Further, the slope of the principle and secondary axis reveal that ambivalence is quickly reduced by increasing either competence or incompetence. We report that the highest levels of ambivalence are created with a small amount of increased incompetence and a small amount of decreased incompetence.

Last, the ability dimension of trust (competence and incompetence) only modestly impedes online transactions, because the lowest levels of trusting intentions reported in this relationship reach nearly -10, while high levels of competence and low levels of incompetence can reach levels of nearly 30. This shows that lack of competence does not strongly inhibit overall trusting intentions, but has greater

available potential impact on overall trust. This may be because of the fundamental attribution error (Ross, 1977). Online buyers may be extending positive attributions towards sellers that overcome perceived competency failures by assuming that the seller is still benevolent or honest and that the fault is beyond the seller's control.

Given the inability of these dimensions to affect ambivalence, we conclude that the impact of the ability dimension within the online relationship is at best a modest asset or at worst relatively no deterrent from shopping online, highlighting that buyers are likely relying upon the trust afforded by a third party and are not as interested in the ability of the online merchant to complete the transaction as expected.

Unexpected results regarding the surface response for integrity and deceit. Rather than higher levels of integrity and lower levels of deceit related to high levels of overall trusting intentions, opposing yet equal magnitudes of integrity and deceit result in high levels of overall trusting intentions, which has never been proposed or found in any extant literature on trust or distrust. For example, if high integrity were perceived (*e.g.*, 10), then for the individual to also have high trusting intentions, moderate levels of deceit would need to be detected (*e.g.*, -3). The highest trusting intention level is obtained when low levels of integrity (3.292) and moderately low levels of deceit are perceived (-1.932).

Further based on the estimates of the axes for integrity and deceit indicate that the highest levels of trust afforded in these relationships is actually quite minimal, indicating that being perceived with high levels of integrity and low levels of deceit does little to greatly increase trust. Of more interest is that when the participants perceived equally high levels of deceit and integrity, they had extremely low levels of trust. The curvatures of the axes reveal that as the magnitudes of these components become uneven, trust is quickly reduced. This highlights that the orientation dimension of trust is most likely to quickly reduce and result in low levels of trust if a buyer perceives that signals regarding deceit and integrity are imbalanced.

We find that high levels of overall trusting intentions can be achieved without having high levels of integrity or low levels of deceit. The response surface indicates that moderate levels of deceit result in high trusting intentions, excepting high scores for the absence of integrity (*i.e.*, -7 or lower). If this finding holds, then it would indicate that trusting intentions could be achieved towards an online seller as long as the vendor is not perceived as being modestly to strongly deceitful and gives minimal perceptions of integrity. That is, in an online setting, buyers might be more product-driven and more personally distanced from the seller, and thus, as long as they receive their desired product without being defrauded, they do not expect or need the seller to have high levels of integrity.

The magnitude of trust shows that integrity and deceit only have a modest influence on the potential for positive trusting intentions. However, if high levels of deceit or a high lack of integrity are perceived, extremely negative scores for trusting intentions are instigated. This could be explained by

attribution theory (Kelley, 1973): When buyers attribute internal motivations for behaviours on the part of a seller, they believe that such behaviours are common, which results in extremely low levels of trusting intentions. In other words, a deceitful seller is expected to continuously seek ways to harm buyers, which will cause them to form negative trusting intentions towards that seller.

Benevolence and malevolence have the highest potential for positively affecting trusting intentions. By achieving high levels of trusting intentions through high levels of benevolence or low levels of malevolence, a buyer can form the most positively-valued trusting intentions among any of the other trust dimensions. Although the benevolence–malevolence response surface is similar to competence–incompetence, the trough of the surface is more flat rather than sloped as indicated by the almost zero slope of the principal component and the increased curvature. This shows that similarly opposing levels of equal magnitude between benevolence and malevolence are equally valued and result in zero to slightly negative levels of negative trusting intentions.

Moreover, this is the only trust dimension in which the high amounts of the positive benevolence subdimension alongside of equally low levels of the negative malevolence subdimension result in the most trust. The other two dimensions require an uneven amount of the opposing subdimensions, but not for benevolence and malevolence. Alongside the highest potential for trust, this indicates that the most important signals for the online merchant to promote are those that indicate their desire for the well-being of the buyer, and to remove those that signal any amount of malevolence.

Ambivalence results of response surface analysis. First, the RSA for competence–incompetence concerning ambivalence yields unexpected results. Rather than high levels of competence and incompetence creating conflicting attitudes, resulting in ambivalence, we find that the condition resulting in minimal ambivalence has only small levels of the two. Specifically, we find that slightly negative competence (-0.302) and slightly positive incompetence (0.283) result in the highest level of ambivalence. Contrary to both recent and classic work on ambivalence (Kaplan, 1972; Sparks *et al.*, 1992; Priester & Petty, 1996; Jonas *et al.*, 1997; Conner *et al.*, 2002; Petty *et al.*, 2006; van Harreveld *et al.*, 2009). This is partially explained by the magnitude of ambivalence being predicted by this response surface.

The highest scores equate to roughly a maximum of 0 ($p_{10}=-1.290$). Thus, it appears that the lack of competence or a show of incompetence is sufficient to reduce the possibility of ambivalence, but that buyers do not view both simultaneously, and thus precipitate ambivalence. Thus, if sellers are perceived as capable in terms of listing product information, they will be perceived as able to enact a transaction and ship the correct product to the correct address. Competence and incompetence do not appear likely to engender any significant amount of ambivalence that would impact the online trust relationship.

Second, we find that both the integrity–deceit and benevolence–malevolence response surfaces

predict ambivalence in accordance with the expectations in traditional ambivalence literature. When a certain magnitude of the trusting component is matched with an equally opposing magnitude of the distrusting component, ambivalence is fomented. This effect only holds for the extreme magnitudes of the components, and not for low levels, in contrast to the case of competence and incompetence.

Finally, we note that the combination of equal magnitudes in terms of integrity and deceit resulted in the greatest potential for ambivalence. This is followed by a weaker effect on ambivalence by malevolence and benevolence. However, these results highlight that the greatest potential cause of ambivalence occurs when the buyer perceives conflicting cues about the seller that imply the seller is equally likely to help and harm the buyer. Even moving to moderate amounts of both deceit and integrity would result in roughly the same amount of ambivalence created by large amounts of benevolence and malevolence. Thus, online merchants should carefully review or modify signals that specifically depict their orientation towards the seller, as this dimension has the strongest implications for the generation of ambivalence, which may negatively influence trusting intentions.

Contributions

The primary contributions of this research are both methodological and conceptual, pointing to theoretical contributions for current and future research in online transactions involving trust, distrust and ambivalence. We have been able to contribute to the research conversation about online trust–distrust by using novel methods to analyse already-established relationships of trust and distrust. We have shown how to use PRA and RSA to analyse the complex constructs of trust and distrust. PRA provided an increase in explained variance as compared to regression results, especially for the prediction of ambivalence. We were able to yield several theoretical insights that would not have been possible through the traditional approaches used in the literature. We note that although these improvements are marginal, they are practically significant given their context. E-commerce sites have recognized low rates of turning website visitors into buyers. Given that trust is crucial for these online transactions, if we are able to increase trust by even a small amount, it would likely have a practical impact on these websites.

Previous literature on trust and distrust has focussed on their overall effects, or joint effects, on some mediating or dependent variable. Our work focusses instead on showing how the established dimensions of trust and distrust influence each other, and how these interactions alter the general trust within the relationship. Previous work has stressed that the impact of distrust has a greater magnitude than trust. We extend this work and further explore how the subdimensions between trust and distrust work together and specify the ideal conditions to increase trust. Surprisingly, we show that it is not only about having high amounts of the trust subdimensions and reducing the distrust subdimensions. The relationships are more nuanced and required PRA and RSA to understand the intricacies involved. This study also reveals that there is likely a greater theoretical complexity amongst the continua of trust–

distrust than has been represented in the literature. These results indicate that more research using advanced analysis techniques is necessary to refine these constructs and associated theories.

Previous work has done little to explore whether the beliefs of the truster regarding the trustee's ability, orientation or honesty are of equal importance. Our work has thoroughly explored the effects of these dimensions and how they work together to influence trust and ambivalence. We specifically highlight that the most important combination of subdimensions for generating general trust is a high amount of benevolence, a low amount of malevolence and a high amounts of competence, along with a minimal amount of incompetence. Deceit and integrity simply do not have the wherewithal to create a high amount of trust. However, a low level of trust is more likely due to either high evidence of integrity or deceit. Although signals of high integrity would not be expected to generate low trust, the truster might believe that the signals are unreliable or "too good to be true." Such findings, unreported to date, are not possible to identify under SEM or regression-based methods found in the extant trust–distrust literature.

In this study's context, we find that the orientation (benevolence–malevolence) of the seller matters more than any other dimension for creating trust, whereas the dependability of the seller in terms of lack of integrity or the presence of deceit will most greatly detract from trusting intentions. We also show that the seller's ability (competence and incompetence) will not strongly detract from trust. It does, however, have the potential to increase overall trusting intentions. Previous research has not determined which dimensions influence trust or in which ways, which suggests abundant further directions for research and practice. We also find that the general ideas of high trust and low distrust hold for ability (competence–incompetence) and orientation (benevolence–malevolence), but not for dependability (integrity–deceit). In fact, only moderate levels of integrity and modestly low levels of deceit produce the highest levels of trusting intentions. Perhaps most shoppers expect a small amount of deceitful signals or the site might be perceived as deceptive. This can be particularly true in an online transaction context, in which consumers generally expect websites to try to get something from them.

The final key theoretical contribution of this study is that by using advanced analysis techniques, we have been able to introduce the ambivalence construct to the trust/distrust literature, thereby responding to Jarvenpaa and Majchrzak's (2010) call for this construct. If ambivalence is indeed the result of trust and distrust (usually at the same magnitude), traditional analysis cannot be used to test it. Thus, ambivalence is a natural extension to the work proposed by McKnight *et al.* (2003) and Dimoka *et al.* (2010), who initially found that trust and distrust are distinct. If they are in fact separable, then what occurs if both are found to be engendered? We find support that ambivalence can be created by the existence of strongly opposing attitudes, but interestingly, not involving the ability subdimension. Rather, competence and incompetence were merely found to reduce ambivalence, but not to instigate ambivalence, no matter their levels of the two. We also show that ambivalence is most strongly aroused

by dependability (integrity–deceit), and then by the contrast between orientations (benevolence–malevolence), especially when both are at high and not low levels. Understanding what does or does not create ambivalence is particularly important because ambivalence has a strong effect on trusting intentions. Website vendors need to create positive, trust-generating experiences for potential consumers, not those that generate unexpected ambivalence.

This study's ambivalence results provide another interesting theoretical and empirical source of support for the claim that trust and distrust are separate components. If they occupy opposite ends of the same continuum, ambivalence cannot be created by manipulating them at the same time because they cannot coexist under this conceptualisation. Hence, the fact that this study's trust–distrust manipulations resulted in the creation of ambivalence supports the assertion that they are indeed separate. Table 13 summarises the key contributions of the analysis to the trust–distrust literature.

Limitations and Future Research

This study has several limitations that present future research opportunities. First, the results show support for the direct effect of ambivalence on trusting intentions, contrary to the more traditionally predicted moderation of the relationships of trust and distrust with trusting intentions. This finding is inconsistent with most ambivalence research, but in accordance with Jonas *et al.*'s (1997) work. Future empirical work needs to replicate and extend these results to explore these relationships further.

This research also has limited generalisability. As in Jonas *et al.* (1997), these results are based on small, inexpensive, standardised products. Future research should explore whether these findings hold for products or services that require higher levels of involvement or experience prior to purchase. The key difference with costly purchases is that increased processing of information would be more beneficial because it could reduce the risks inherent in such purchases. Hence, adding risk to the model could be potentially useful to understand its role in producing ambivalence.

Regarding student subjects, we highlight three factors that minimise this potential threat against generalisability. First, a meta-analysis by King and He (2006) found that the use of student subjects in technology use contexts, as compared to other subjects, results in no statistical difference. Second, leading IS and behavioural researchers have proposed that if the context and phenomenon being investigated are familiar to them, then the use of students is appropriate (Gordon *et al.*, 1986; Compeau *et al.*, 2012). In our case, students are experienced online users and shoppers and are thus good representatives of the general population of online shoppers. Third, many other online studies in similar contexts have relied upon student subjects for the same reasons, thereby making our work more comparable to their results (e.g., Lowry *et al.*, 2008; Parboteeah *et al.*, 2009; Dimoka, 2010; Wells *et al.*, 2011).

Finally, the results are based on the intention to trust a fictitious third party rather than actual shopping or browsing behaviours. Although other leading online transaction studies have typically

Table 13 Summary of the Key Contributions to Online Trust–Distrust Literature

<i>Analysis approach</i>	<i>Key result</i>	<i>Interpretation and contribution</i>
Regression with trust–distrust difference scores (Table 9) vs. regression with trust–distrust separate components (Table 10)	Separating trust from distrust increases the predictive power of the models.	Supports theory and empirical research claiming that trust and distrust are separate components, not opposite ends of the same spectrum.
PRA (Table 11) + canonical correlation	Adding higher-order and interactive terms in the PRA equation increases predictive power of the separate components analysis from Table 10. Introduction of ambivalence to the literature.	(1) supports trust and distrust as separate components, but suggests they have related continua; (2) that the continua have a more complex relationship than in the literature; and (3) that the relationship between the two is not a mere interaction or linear combination, but rather a third-order relationship due to the engenderment of ambivalence. PRA and canonical correlation indicates that trust and distrust have distinct components and variance. Increased the explanatory power of ambivalence by almost 300% above the predictive power of trust and distrust components alone.
RSA of the PRA equation	If competence, integrity and benevolence are high, trusting intentions are high. Competence strongly affects trusting intentions, but incompetence weakly affects them. Opposing, equal magnitudes of integrity and deceit result in minimal increases to levels of trusting intentions, but have the potential for greatly reducing them. High levels of benevolence and low levels of malevolence result in high trusting intentions. Only low to no levels of competence and low to no levels of incompetence create ambivalence. When a certain magnitude of integrity is matched with deceit, or malevolence is matched with benevolence, ambivalence is invoked.	Supports basic assumption in the literature of trusting intentions occurring when overall trust is high and distrust is low. Competence is more important than incompetence. High levels of trusting intentions do not require high levels of integrity or low levels of deceit; integrity can be satisfied. Rather, high levels of either integrity or deceit will result in lower levels of trust. Signals of extremes in orientation will reduce trust. Benevolence and lack of malevolence have the strongest potential for increasing trusting intentions. Contrary to the findings in the ambivalence literature, ambivalence can be created by weakly to moderately invoked competence and incompetence attitudes or relatively equal magnitudes. The ambivalence literature proposes that the magnitudes need to be at least moderate. Equal magnitudes of integrity–deceit or benevolence–malevolence create ambivalence. The orientation (integrity, deceit) of the seller raises the greatest potential for ambivalence.

focused on the trustor's intentions as the ultimate dependent variable (Dinev & Hart, 2006; Lowry *et al.*, 2008; Porter & Donthu, 2008; Qiu & Benbasat, 2009), the influence of trust and distrust on actual behaviours might be dissimilar to their effects on intentions. Further, the research on ambivalence has focussed on the moderation of beliefs with behaviours, not intentions. Thus, future research should explore whether these results and model hold for actual behaviour.

Conclusions

Substantial research has focussed on the critical roles that trust and distrust play in the success of online transactions and relationships. Unfortunately, current models of trust and distrust have limitations that impede the ability to explain how ambivalence is generated by them (or if ambivalence can even be generated) and how all three can best coexist. We thus proposed a hybrid model of trust–distrust to address the limitations and strengths of previous trust–distrust models. We posited that trust and distrust could in fact coexist as separate components, but with related continua. We used PRA and RSA to investigate these complex relationships. This confirmed that indeed, trust and distrust are most likely separate components, not opposite ends of the same continuum, with related continua. We also found that the continua within the subconstructs of trust and distrust likely have more complex and interesting relationships than has been considered in the literature. These findings lead to interesting future research opportunities on trust, distrust and ambivalence using advanced techniques such as PRA and RSA.

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Appendix 1. Instrument Detail

Table A1 Instrument Detail

Construct	Subconstruct	Items
Trusting intentions (Second-order formative; McKnight <i>et al.</i> (2002)	Willingness to depend	WD1. When an important issue or problem arises, I would feel comfortable depending on the information provided by the seller.
		WD2. I could always rely on the seller in a tough situation.
		WD3. I feel that I could count on the seller to help with a crucial problem.
		WD4. Faced with a difficult situation that required me to buy a given product right now, I would use the seller.
	Willingness to follow advice	FA1. If I had a challenging problem, I would want to use the seller again.
		FA2. I would feel comfortable acting on the information given to me by the seller.
		FA3. I would not hesitate to use the information the seller supplied me.
		FA4. I would confidently act on the information I was given by the seller.
		FA5. I would feel secure in using the information from the seller.
		FA6. Based on the scenario I just reviewed, I would buy the product, and be assured that the correct item, in good condition would be sent to me.
Willingness to give information	“Suppose you wanted more specific information about a given product and you could consult (one time only) by telephone with a salesman from the seller for 15–30 minutes (free of charge). For this service, please answer the following:”	
	GI1. I would be willing to provide information like my name, address and phone number to the seller’s representative.	
	GI2. I would be willing to provide my social security number to the seller’s representative.	
Make purchase	GI3. I would be willing to share the specifics of my product needs with the seller’s representative.	
	“Suppose the Amazon.com was not free, but charged to access product information on the site. Answer the following questions:”	
	MP1. Faced with a difficult situation, I would be willing to pay to access information about the product.	
	MP2. I would be willing to provide credit card information to the seller.	
Trusting beliefs (Second-order formative; McKnight <i>et al.</i> (2002)	Benevolence	BEN1. I believe that the seller would act in my best interest.
		BEN2. If I required help, the seller would do his or her best to help me.
		BEN3. The seller is interested in my well-being, not just his or her own.
	Competence	COMP1. The seller would be competent and effective in providing the product.
		COMP2. The seller would perform his or her role of providing opportunities for the product very well.
		COMP3. Overall, the seller would be a capable and proficient provider of the product.
		COMP4. In general, the seller would be very knowledgeable about the product.
	Integrity	INT1. The seller would be truthful in his or her dealings with me.
		INT2. I would characterise the seller as honest.
		INT3. The seller would keep his or her commitments.
Malevolence	INT4. The seller would be sincere and genuine.	
	MAL1. I worry that the seller is only concerned about his or her own interests.	
Distrusting beliefs (Second-order	Malevolence	MAL2. It concerns me a lot that the seller pretends to care more about me than he or she really does.

<p>formative; McKnight <i>et al.</i> (2002); McKnight and Choudhury (2006)</p>	<p>Incompetence</p>	<p>MAL3. I fear that the seller inwardly dislikes putting himself or herself out to help other buyers. INCOMP1. I am troubled that the seller is not as knowledgeable in his or her field as I would expect. INCOMP2. I am cautious because I believe that the seller does a haphazard job at what he or she does. INCOMP3. Concern is justified, since the seller is not really competent in his or her area of expertise.</p>
	<p>Deceit</p>	<p>DECT1. Unfortunately, the seller would tell a lie if he or she could gain by it. DECT2. It's a troubling fact that the seller won't always hold to the standard of honesty he or she claims. DECT3. Sadly, the seller would cheat on his or her financial statements if he or she thought he or she could get away with it.</p>
<p>Ambivalence Priester <i>et al.</i> (2007)</p>	<p>N/A</p>	<p>"Indicate your agreement with the following statements:" AMBIV1. Possessed reactions that were mixed versus one-sided. AMBIV2. Felt conflict in their reactions. AMBIV3. Experienced behavioural indecision. AMBIV4. Felt tension in their thoughts and feelings. AMBIV5. Felt ambivalence.</p>

Online Appendix 2. Detailed Experimental Methods

Note to editors and reviewers: because of length restrictions, these appendices are intended to be used as online supplements to the main article and to support the review process.

The experimental webpages are shown by the treatment conditions below in Table A1.2–A1.9.

Table A1.2 Control Treatment – No Distrust Signals

amazon.com Hello. Sign in to get personalized recommendations. New customer? Start here. Kindle 2 Has Arrived

Your Amazon.com Today's Deals Gifts & Wish Lists Gift Cards

Shop All Departments Search Electronics Cart Your Lists

Electronics Browse by Brands Bestsellers Camera & Photo Computers & Accessories Audio, TV & Home Theater Cell Phones & Service Office Electronics Car Electronics & GPS Today's Deals

This item is not eligible for Amazon Prime when purchased from Planet LUVZ. See more buying choices.

Energizer Rechargeable AA NiMH Batteries (8 Pack)

List Price: \$19.99
Price: \$12.47
You Save: \$7.52 (38%)

In Stock.
Ships from and sold by Planet LUVZ.

44 new from \$11.45

Amazon.com Special Offer: Save \$10 when you spend \$39 or more on eligible Energizer batteries sold by Amazon.com. Enter code ENERGA09 at checkout. [Shop now](#)

Product Description
8 NIMH "AA" rechargeable batteries * each battery rated at 2500mAh *

Product Details
Product Dimensions: 5 x 1 x 4 inches ; 1 pounds
Shipping Weight: 8 ounces (View shipping rates and policies)
Shipping: Currently, item can be shipped only within the U.S.
ASIN: B0002DUQCM
Item model number: NH15BP-8

Product Info Page

Planet LUVZ Storefront

At a Glance Feedback Shipping Rates Returns Seller Help

Planet LUVZ
Feedback Rating: ★★★★★
4.9 stars over the past 12 months (117 ratings)

Feedback	30 days	90 days	365 days	Lifetime
Positive	100%	100%	100%	100%
Neutral	0%	0%	0%	0%
Negative	0%	0%	0%	0%
Count	62	117	117	117

What do these mean?

Recent Feedback:

5 out of 5: "It actually arrived a day early and was exactly as described."
Date: 4/21/2009 Rated by Buyer: Carla S.

5 out of 5: "Item arrived on time and in perfect condition."
Date: 4/21/2009 Rated by Buyer: esd22

5 out of 5: "The item arrived on time and in the original packaging as described. I would buy from this seller again."
Date: 4/21/2009 Rated by Buyer: Kathy J.

5 out of 5: "Great efficiency!"
Date: 4/21/2009 Rated by Buyer: Katie L.

5 out of 5: "Excellent transaction."
Date: 4/20/2009 Rated by Buyer: shawn s.

5 out of 5: "Awesome service...."
Date: 4/20/2009 Rated by Buyer: Edna E.

Planet LUVZ Storefront

At a Glance Feedback Shipping Rates Returns Seller Help

Planet LUVZ
Feedback Rating: ★★★★★
4.9 stars over the past 12 months (117 ratings)

Feedback	30 days	90 days	365 days	Lifetime
Positive	100%	100%	100%	100%
Neutral	0%	0%	0%	0%
Negative	0%	0%	0%	0%
Count	62	117	117	117

What do these mean?

Recent Feedback:

5 out of 5: "It actually arrived a day early and was exactly as described."
Date: 4/21/2009 Rated by Buyer: Carla S.

5 out of 5: "Item arrived on time and in perfect condition."
Date: 4/21/2009 Rated by Buyer: esd22

5 out of 5: "The item arrived on time and in the original packaging as described. I would buy from this seller again."
Date: 4/21/2009 Rated by Buyer: Kathy J.

5 out of 5: "Great efficiency!"
Date: 4/21/2009 Rated by Buyer: Katie L.

5 out of 5: "Excellent transaction."
Date: 4/20/2009 Rated by Buyer: shawn s.

5 out of 5: "Awesome service...."
Date: 4/20/2009 Rated by Buyer: Edna E.

Customer Review Page

amazon.com [SIGN IN](#) [SHIPPING & PAYMENT](#) [GIFT-WRAP](#) [PLACE ORDER](#)

Or enter a new shipping address
Be sure to click "Ship to this address" when done.

Full Name:

Address Line1:
Street address, P.O. box, company name, c/o

Address Line2:
Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP/Postal Code:

Country:

Phone Number:

[Ship to this address](#)

Info Entry Page

amazon.com [SIGN IN](#) [SHIPPING & PAYMENT](#) [GIFT-WRAP](#) [PLACE ORDER](#)

Please review and submit your order
By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order." [Place your order](#)

Shipping to: [Change](#)

Jane Doe
209 MERVIS HL
PITTSBURGH, PA 15260-7502
United States
Phone: 412-123-4567

Shipping Options: [Learn more](#)

Choose a shipping speed:

Standard (3-5 business days)

Expedited (1-3 business days)

Need to [Change quantities or delete](#)?

Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUVZ will ship your item in accordance with their estimate below.

Engizener Rechargeable AA Nihm Batteries (8 Pack)
\$12.47 - Quantity: 1 - In Stock
Condition: New
Sold by: Planet LUVZ

Order Summary

Items: \$12.47
Shipping & Handling: \$5.95

Total Before Tax: \$18.42
Estimated Tax: \$0.00
Total: \$18.42
Gift Certificate/Card: -\$3.87

Order Total: \$14.55

[Why didn't I qualify for FREE Super Saver Shipping?](#)

Order Confirmation Page

Table A1.3 Distrust Treatment 1 – No Trust Signals

amazon.com [Hello. Sign in to get personalized recommendations.](#) [New customer? Start here.](#) [Kindle 2 Has Arrived](#) [Your Account](#) [Help](#)

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Electronics [Browse Brands](#) [Bestsellers](#) [Camera & Photo](#) [Computers & Accessories](#) [Audio, TV & Home Theater](#) [Cell Phones & Service](#) [Office Electronics](#) [Car Electronics & GPS](#) [Today's Deals](#)

This item is not eligible for Amazon Prime when purchased from Planet LUVZ. See more buying choices.

Engizener Rechargeable AA Nihm Batteries (8 Pack)
Other products by [Engizener](#)
★ ★ ★ ★ ☆ (59 customer reviews)

List Price: \$19.99
Price: \$20.47

In Stock.
Ships from and sold by [Planet LUVZ](#).

[44 new](#) from \$11.45

[See larger image](#)
[Share your own customer images](#)

Special Offer
Amazon.com Special Offer
Save \$10 when you spend \$39 or more on eligible Engizener batteries sold by Amazon.com. Enter code ENER409 at checkout. [Shop now](#)

Product Description
Product Description
8 NiMH "AA" rechargeable batteries * each battery rated at 2500mAh *

Product Details
View the [Owner's Manual](#) (PDF)
Product Dimensions: 17.5 x 11.5 x 14.5 inches ; 25 pounds
Shipping Weight: 32.6 pounds (View shipping rates and policies)

Planet LUVZ Storefront

[At a Glance](#) [Feedback](#) [Shipping Rates](#) [Returns](#) [Seller Help](#)

Planet LUVZ
Feedback Rating: JUST LAUNCHED

Feedback	30 days	90 days	365 days	Lifetime
Positive	-	-	-	-
Neutral	-	-	-	-
Negative	-	-	-	-
Count	0	0	0	0

[What do these mean?](#)

Recent Feedback: [See all feedback](#)

Product Info Page



Or enter a new shipping address

Be sure to click "Ship to this address" when done.

Full Name:
Address Line1:
Street address, P.O. box, company name, c/o
Address Line2:
Apartment, suite, unit, building, floor, etc.
City:
State/Province/Region:
ZIP/Postal Code:
Country:
Phone Number:

[Ship to this address](#)



Info Entry Page

Customer Review Page



Please review and submit your order

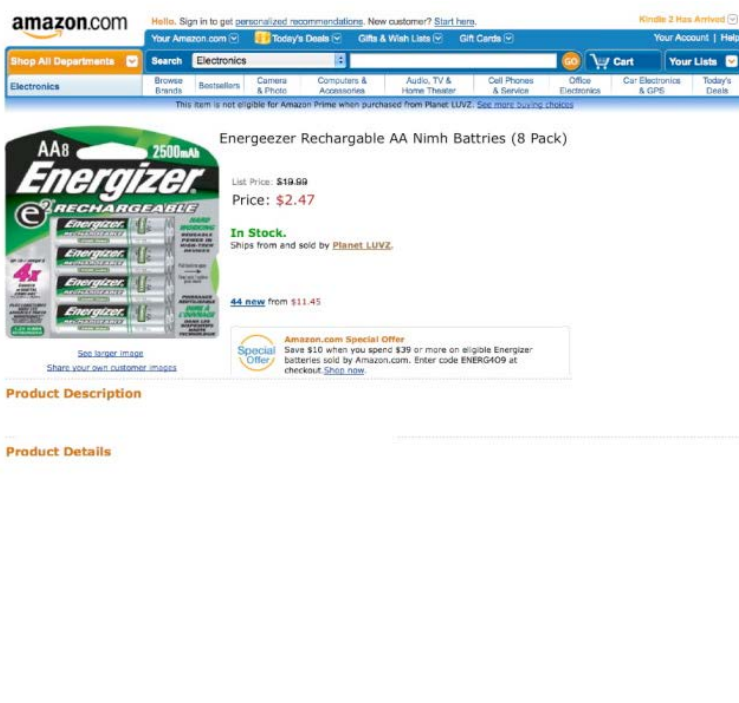
By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

[Review the information below, then click "Place your order."](#) [Place your order](#)

Shipping Details	Order Summary
Shipping to: Change Jane Doe 209 MERVIS HL PITTSBURGH, PA 15260-7502 United States Phone: 412-123-4567 Shipping Options: Learn more Choose a shipping speed: <input checked="" type="radio"/> Standard (3-5 business days) <input type="radio"/> Expedited (1-3 business days) <small>Need to Change quantities or details?</small> <small>Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUVZ will ship your item in accordance with their estimate below.</small>	Items: \$26.47 Shipping & Handling: \$5.96 Total Before Tax: \$32.42 Estimated Tax: * \$0.00 Total: \$32.42 Order Total: \$26.42

Order Confirmation Page

Table A1.4 Distrust Treatment 2 – Incompetence Signals

 <p>amazon.com Hello, Sign in to get personalized recommendations. New customer? Start here. Kindle 2 Has Arrived</p> <p>Search: Electronics</p> <p>Energizer Rechargeable AA NiMH Batteries (8 Pack)</p> <p>List Price: \$19.99 Price: \$2.47</p> <p>In Stock. Ships from and sold by Planet LUYZ.</p> <p>44 new from \$11.45</p> <p>Amazon.com Special Offer: Save \$1.0 when you spend \$39 or more on eligible Energizer batteries sold by Amazon.com. Enter code ENERGF09 at checkout. Shop now</p> <p>Product Description</p> <p>Product Details</p>	<p>The Price Pros Storefront</p> <p>At a Glance Feedback Shipping Rates Returns Seller Help</p> <p>The Price Pros Feedback Rating: ★★★★★ 3.7 stars over the past 12 months (2908 ratings)</p> <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>95%</td> <td>94%</td> <td>67%</td> <td>67%</td> </tr> <tr> <td>Neutral</td> <td>3%</td> <td>2%</td> <td>4%</td> <td>4%</td> </tr> <tr> <td>Negative</td> <td>2%</td> <td>4%</td> <td>29%</td> <td>29%</td> </tr> <tr> <td>Count</td> <td>233</td> <td>681</td> <td>2908</td> <td>2908</td> </tr> </tbody> </table> <p>What do these mean?</p> <p>Recent Feedback:</p> <p>2 out of 5: "Order took more than 18 days for delivery is not at all satisfactory. Until today still not delivered - too late!!!" Date: 4/20/2009 Rated by Buyer: Hesham M.</p> <p>5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B.</p> <p>3 out of 5: "Company did not have item in stock as listed on Amazon. Order was cancelled with this vendor." Date: 4/20/2009 Rated by Buyer: madic2</p> <p>4 out of 5: "I order 6 new but received used after contcting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad</p> <p>3 out of 5: "They didn't have the product. They contact me and refund the money." Date: 4/18/2009 Rated by Buyer: RAFAEL B.</p> <p>5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: _Joughlin</p> <p>4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S.</p> <p>1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they lied by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain. I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj</p>	Feedback	30 days	90 days	365 days	Lifetime	Positive	95%	94%	67%	67%	Neutral	3%	2%	4%	4%	Negative	2%	4%	29%	29%	Count	233	681	2908	2908
Feedback	30 days	90 days	365 days	Lifetime																						
Positive	95%	94%	67%	67%																						
Neutral	3%	2%	4%	4%																						
Negative	2%	4%	29%	29%																						
Count	233	681	2908	2908																						
<p>Product Info Page</p>	<p>Customer Review Page</p>																									

amazon.com [SIGN IN](#) [SHIPPING & PAYMENT](#) [GIFT-WRAP](#) [PLACE ORDER](#)

Or enter a new shipping address
 Be sure to click "Ship to this address" when done.

Full Name:

Address Line1:
Street address, P.O. box, company name, c/o

Address Line2:
Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP/Postal Code:

Country:

Phone Number:

Sexual Orientation:

Mother's Maiden Name:

Info Entry Page

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Please review and submit your order
 By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order."

Shipping to: [Change](#)

Jane Doe
 209 MERVIS HL
 PITTSBURGH, PA 15260-7502
 United States
 Phone: 412-123-4567

Shipping Options: [Learn more](#)

Choose a shipping speed:

Standard (3-5 business days)

Expedited (1-3 business days)


Need to [Change quantities or delete?](#)

Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUVZ will ship your item in accordance with their estimate below.

Items:	\$2.47
Shipping & Handling:	\$5.95
Total Before Tax:	\$8.42
Estimated Tax:**	\$0.00
Total	\$8.42
Order Total: \$8.42	

Order Confirmation Page

Table A1.5 Distrust Treatment 3 – Malevolence Signals

 <p>amazon.com Hello, Sign in to get personalized recommendations. New customer? Start here. Kindle 2 Has Arrived</p> <p>Your Amazon.com Today's Deals Gifts & Wish Lists Gift Cards Your Account Help</p> <p>Shop All Departments Search Electronics</p> <p>Electronics Browse Brands Bestsellers Camera & Photo Computers & Accessories Audio, TV & Home Theater Cell Phones & Services Office Electronics Car Electronics Today's Deals</p> <p>This item is not eligible for Amazon Prime when purchased from Planet LUVZ. See more buying choices.</p> <p>Energizer Rechargeable AA NiMH Batteries (8 Pack)</p> <p>List Price: \$19.99 Price: \$2.47</p> <p>In Stock. Ships from and sold by Planet LUVZ.</p> <p>44 new from \$11.45</p> <p>Amazon.com Special Offer Save \$10 when you spend \$39 or more on eligible Energizer batteries sold by Amazon.com. Enter code ENERGH09 at checkout. Shop now</p> <p>Product Description</p> <p>Product Details</p>	<p>The Price Pros Storefront</p> <p>At a Glance Feedback Shipping Rates Returns Seller Help</p> <p>The Price Pros Feedback Rating: ★★★★☆ 3.7 stars over the past 12 months (2908 ratings)</p> <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>95%</td> <td>94%</td> <td>67%</td> <td>67%</td> </tr> <tr> <td>Neutral</td> <td>3%</td> <td>2%</td> <td>4%</td> <td>4%</td> </tr> <tr> <td>Negative</td> <td>2%</td> <td>4%</td> <td>29%</td> <td>29%</td> </tr> <tr> <td>Count</td> <td>233</td> <td>681</td> <td>2908</td> <td>2908</td> </tr> </tbody> </table> <p>What do these mean?</p> <p>Recent Feedback: See all feedback</p> <ul style="list-style-type: none"> 2 out of 5: "Order took more than 18 days for delivery is not at all satisfactory. Until today still not delivered - too late!!!" Date: 4/20/2009 Rated by Buyer: Hesham M. 5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B. 3 out of 5: "Company did not have item in stock as listed on Amazon. Order was cancelled with this vendor." Date: 4/20/2009 Rated by Buyer: madlic2 4 out of 5: "I order 6 new but received used after contacting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad 3 out of 5: "They didn't have the product. They contact me and refund the money." Date: 4/18/2009 Rated by Buyer: RAFAEL B. 5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: J_loughlin 4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S. 1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they lied by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain. I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj 	Feedback	30 days	90 days	365 days	Lifetime	Positive	95%	94%	67%	67%	Neutral	3%	2%	4%	4%	Negative	2%	4%	29%	29%	Count	233	681	2908	2908
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Negative	2%	4%	29%	29%																						
Count	233	681	2908	2908																						
<p>Product Info Page</p>	<p>Customer Review Page</p>																									

Or enter a new shipping address

Be sure to click "Ship to this address" when done.

Full Name: [input field]

Address Line1: [input field] Street address, P.O. box, company name, c/o

Address Line2: [input field] Apartment, suite, unit, building, floor, etc.

City: [input field]

State/Province/Region: [input field]

ZIP/Postal Code: [input field]

Country: [dropdown menu] United States

Phone Number: [input field]

Sexual Orientation: [input field]

Mother's Maiden Name: [input field]

Ship to this address

Info Entry Page

Please review and submit your order

By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order."

Place your order

Shipping Details

Shipping to: [Change]

Jane Doe
209 MERVIS HL
PITTSBURGH, PA 15260-7502
United States
Phone: 412-123-4567

Shipping Options: [Learn more]

Choose a shipping speed:

- Standard (3-5 business days)
- Expedited (1-3 business days)

Need to [Change quantities or delete] ?

Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUVZ will ship your item in accordance with their estimate below.

Items:	\$2.47
Shipping & Handling:	\$5.95
Total Before Tax:	\$8.42
Estimated Tax:*	\$0.00
Total	\$8.42

Order Total: \$8.42

Order Confirmation Page

Table A1.6 Distrust Treatment 4 – Deceit Signals

<p>Product Description 8 NiMH "AA" rechargeable batteries * each battery rated at 2500mAh *</p> <p>Product Details View the Owner's Manual (pdf) Product Dimensions: 17.5 x 11.5 x 14.5 inches ; 25 pounds Shipping Weight: 32.6 pounds (View shipping rates and policies) Shipping: Currently, item can be shipped only within the U.S. Shipping Advisory: This item must be shipped separately from other items in your order. Additional shipping charges will not apply. ASIN: B000TKHMWK California residents: Click here for Proposition 65 warning. Item model number: 852-2007</p> <p>Product Specifications</p> <table border="1"> <tr> <td colspan="2">Product Information</td> </tr> <tr> <td>Brand:</td> <td>Duracell</td> </tr> <tr> <td colspan="2">Sizing and Specifications</td> </tr> <tr> <td>Item Weight:</td> <td>25 Pounds</td> </tr> </table>	Product Information		Brand:	Duracell	Sizing and Specifications		Item Weight:	25 Pounds	<p>The Price Pros Feedback Rating: ★★★★★ 3.7 stars over the past 12 months (2908 ratings)</p> <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>95%</td> <td>94%</td> <td>67%</td> <td>67%</td> </tr> <tr> <td>Neutral</td> <td>3%</td> <td>2%</td> <td>4%</td> <td>4%</td> </tr> <tr> <td>Negative</td> <td>2%</td> <td>4%</td> <td>29%</td> <td>29%</td> </tr> <tr> <td>Count</td> <td>233</td> <td>681</td> <td>2908</td> <td>2908</td> </tr> </tbody> </table> <p>Recent Feedback:</p> <ul style="list-style-type: none"> 2 out of 5: "Order took more than 18 days for delivery is not at all satisfactory. Until today still not delivered - too late!!!" Date: 4/20/2009 Rated by Buyer: Hesham M. 5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B. 3 out of 5: "Company did not have item in stock as listed on Amazon. Order was cancelled with this vendor." Date: 4/20/2009 Rated by Buyer: madlic2 4 out of 5: "I order 6 new but received used after contacting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad 3 out of 5: "They didn't have the product. They contact me and refund the money." Date: 4/18/2009 Rated by Buyer: RAFAEL B. 5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: J_loughlin 4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S. 1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they lied by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain. I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj 	Feedback	30 days	90 days	365 days	Lifetime	Positive	95%	94%	67%	67%	Neutral	3%	2%	4%	4%	Negative	2%	4%	29%	29%	Count	233	681	2908	2908
Product Information																																		
Brand:	Duracell																																	
Sizing and Specifications																																		
Item Weight:	25 Pounds																																	
Feedback	30 days	90 days	365 days	Lifetime																														
Positive	95%	94%	67%	67%																														
Neutral	3%	2%	4%	4%																														
Negative	2%	4%	29%	29%																														
Count	233	681	2908	2908																														
<p>Product Info Page</p>	<p>Customer Review Page</p>																																	



SIGN IN SHIPPING & PAYMENT GIFT-WRAP PLACE ORDER

Or enter a new shipping address

Be sure to click "Ship to this address" when done.

Full Name:

Address Line1:
Street address, P.O. box, company name, c/o

Address Line2:
Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP/Postal Code:

Country:

Phone Number:

Ship to this address



Info Entry Page



SIGN IN SHIPPING & PAYMENT GIFT-WRAP PLACE ORDER

Please review and submit your order

By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order."

Place your order

Shipping Details

Shipping to: [Change](#)

Jane Doe
209 MERVIS HL
PITTSBURGH, PA 15260-7502
United States
Phone: 412-123-4567

Shipping Options: [Learn more](#)

Choose a shipping speed:
 Standard (3-5 business days)
 Expedited (1-3 business days)

Need to [Change quantities or delete](#)?

Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUNZ will ship your item in accordance with their estimate below.


Order Summary

Items:	\$20.47
Shipping & Handling:	\$5.95
Total Before Tax:	\$26.42
Estimated Tax:*	\$0.00
Total:	\$26.42

Order Total: \$26.42

Order Confirmation Page

Table A1.7 Ambivalence Treatment 1

 <p>amazon.com Hello, Sign in to get personalized recommendations. New customer? Start here. Kindle 2 Has Arrived</p> <p>Your Amazon.com Today's Deals Gifts & Wish Lists Gift Cards Your Account Help</p> <p>Shop All Departments Search Electronics Browse Brands Bestsellers Camera & Photo Computers & Accessories Audio, TV & Home Theater Cell Phones & Services Office Electronics Car Electronics Today's Deals</p> <p>This item is not eligible for Amazon Prime when purchased from Planet LUVZ. See more buying choices.</p> <p>Energizer Rechargeable AA NiMH Batteries (8 Pack)</p> <p>List Price: \$19.99 Price: \$12.47 You Save: \$7.52 (38%)</p> <p>In Stock. Ships from and sold by Planet LUVZ.</p> <p>44 new from \$11.45</p> <p>Amazon.com Special Offer Special Offer Save \$10 when you spend \$39 or more on eligible Energizer batteries sold by Amazon.com. Enter code ENERGH09 at checkout. Shop now</p> <p>Product Description Product Description 8 NIMH "AA" rechargeable batteries * each battery rated at 2500mAh *</p> <p>Product Details Product Dimensions: 5 x 1 x 4 Inches ; 1 pounds Shipping Weight: 8 ounces (View shipping rates and policies) Shipping: Currently, item can be shipped only within the U.S. ASIN: B0002DUQCM Item model number: NH15BP-8</p>	<p>The Price Pros Storefront</p> <p>At a Glance Feedback Shipping Rates Returns Seller Help</p> <p>The Price Pros Feedback Rating: ★★★★☆ 3.7 stars over the past 12 months (2908 ratings)</p> <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>95%</td> <td>94%</td> <td>67%</td> <td>67%</td> </tr> <tr> <td>Neutral</td> <td>3%</td> <td>2%</td> <td>4%</td> <td>4%</td> </tr> <tr> <td>Negative</td> <td>2%</td> <td>4%</td> <td>29%</td> <td>29%</td> </tr> <tr> <td>Count</td> <td>233</td> <td>681</td> <td>2908</td> <td>2908</td> </tr> </tbody> </table> <p>What do these mean?</p> <p>Recent Feedback: See all feedback</p> <ul style="list-style-type: none"> 2 out of 5: "Order took more than 18 days for delivery is not at all satisfactory. Until today still not delivered - too late!!!" Date: 4/20/2009 Rated by Buyer: Hesham M. 5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B. 3 out of 5: "Company did not have item in stock as listed on Amazon. Order was cancelled with this vendor." Date: 4/20/2009 Rated by Buyer: madlic2 4 out of 5: "I order 6 new but received used after contacting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad 3 out of 5: "They didn't have the product. They contact me and refund the money." Date: 4/18/2009 Rated by Buyer: RAFAEL B. 5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: J_loughlin 4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S. 1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they lied by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain. I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj 	Feedback	30 days	90 days	365 days	Lifetime	Positive	95%	94%	67%	67%	Neutral	3%	2%	4%	4%	Negative	2%	4%	29%	29%	Count	233	681	2908	2908
Feedback	30 days	90 days	365 days	Lifetime																						
Positive	95%	94%	67%	67%																						
Neutral	3%	2%	4%	4%																						
Negative	2%	4%	29%	29%																						
Count	233	681	2908	2908																						
<p>Product Info Page</p>	<p>Customer Review Page</p>																									

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Or enter a new shipping address
Be sure to click "Ship to this address" when done.

Full Name:

Address Line1:
Street address, P.O. box, company name, c/o

Address Line2:
Apartment, suite, unit, building, floor, etc.

City:

State/Province/Region:

ZIP/Postal Code:

Country:

Phone Number:

[Ship to this address](#)

Info Entry Page

amazon.com [SIGN IN](#) [SHIPPING & PAYMENT](#) [GIFT-WRAP](#) [PLACE ORDER](#)


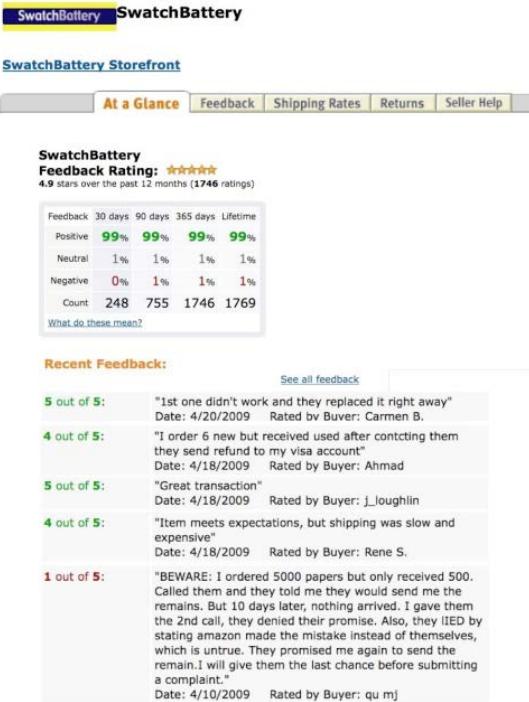
Please review and submit your order
By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

[Review the information below, then click "Place your order."](#) [Place your order](#)

Shipping Details	Order Summary
<p>Shipping to: Change</p> <p>Jane Doe 209 MERVIS HL PITTSBURGH, PA 15260-7502 United States Phone: 412-123-4567</p> <p>Shipping Options: Learn more</p> <p>Choose a shipping speed:</p> <p><input checked="" type="radio"/> Standard (3-5 business days)</p> <p><input type="radio"/> Expedited (1-3 business days)</p> <p>Need to: Change quantities or delete ?</p> <p><small>Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUVZ will show your item in accordance with their estimate below.</small></p> <p>Energizer Rechargeable AA Nihm Batteries (8 Pack) \$12.47 - Quantity: 1 - In Stock Condition: New Sold by: Planet LUVZ</p>	<p>Items: \$12.47 Shipping & Handling: \$5.95 Total Before Tax: \$18.42 Estimated Tax:** \$0.00 Total: \$18.42 Gift Certificate/Card: -\$3.87</p> <p>Order Total: \$14.55</p> <p>Why didn't I qualify for FREE Super Saver Shipping?</p>

Order Confirmation Page

Table A1.8 Ambivalence Treatment 2

 <p>Product Description 8 NIMH "AA" rechargeable batteries * each battery rated at 2500mAh *</p> <p>Product Details Product Dimensions: 5 x 1 x 4 Inches ; 1 pounds Shipping Weight: 8 ounces (View shipping rates and policies) Shipping: Currently, item can be shipped only within the U.S. ASIN: B0002DUQCM Item model number: NH15BP-8</p>	 <p>SwatchBattery Feedback Rating: ★★★★★ 4.9 stars over the past 12 months (1746 ratings)</p> <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>99%</td> <td>99%</td> <td>99%</td> <td>99%</td> </tr> <tr> <td>Neutral</td> <td>1%</td> <td>1%</td> <td>1%</td> <td>1%</td> </tr> <tr> <td>Negative</td> <td>0%</td> <td>1%</td> <td>1%</td> <td>1%</td> </tr> <tr> <td>Count</td> <td>248</td> <td>755</td> <td>1746</td> <td>1769</td> </tr> </tbody> </table> <p>Recent Feedback:</p> <ul style="list-style-type: none"> 5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B. 4 out of 5: "I order 6 new but received used after contcting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad 5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: j_loughlin 4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S. 1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they IED by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain.I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj 	Feedback	30 days	90 days	365 days	Lifetime	Positive	99%	99%	99%	99%	Neutral	1%	1%	1%	1%	Negative	0%	1%	1%	1%	Count	248	755	1746	1769
Feedback	30 days	90 days	365 days	Lifetime																						
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<p>Product Info Page</p>	<p>Customer Review Page</p>																									

Or enter a new shipping address

Be sure to click "Ship to this address" when done.

Full Name:
Address Line1:
Street address, P.O. box, company name, c/o
Address Line2:
Apartment, suite, unit, building, floor, etc.
City:
State/Province/Region:
ZIP/Postal Code:
Country:
Phone Number:
Sexual Orientation:
Mother's Maiden Name:

Info Entry Page

Please review and submit your order


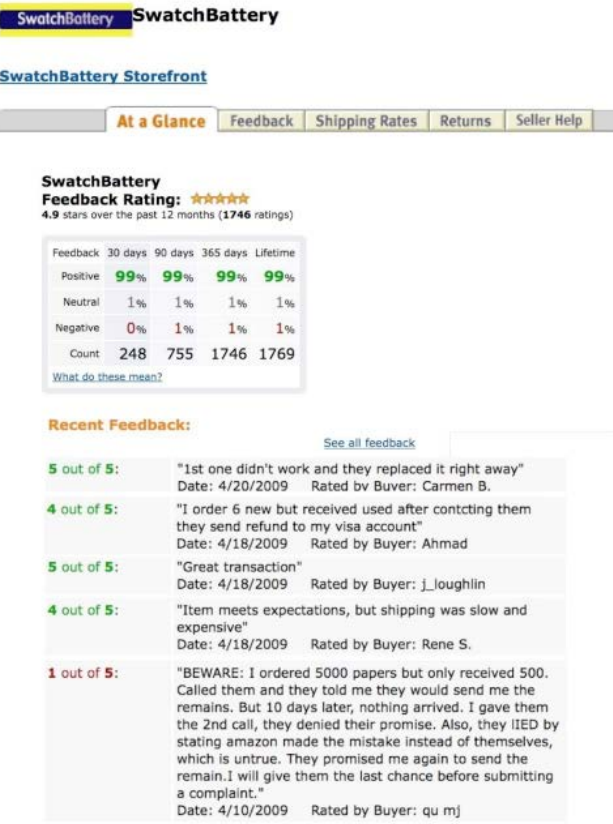
By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order."

Shipping Details	Order Summary										
Shipping to: Change Jane Doe 209 MERVIS HL PITTSBURGH, PA 15260-7502 United States Phone: 412-123-4567 Shipping Options: Learn more Choose a shipping speed: <input checked="" type="radio"/> Standard (3-5 business days) <input type="radio"/> Expedited (1-3 business days) Need to Change quantities or delete? <small>Amazon Payments will charge your credit or debit card for this part of your purchase when you place your order. Planet LUNZ will ship your item in accordance with their estimate below.</small>	<table> <tr> <td>Items:</td> <td>\$20.47</td> </tr> <tr> <td>Shipping & Handling:</td> <td>\$5.95</td> </tr> <tr> <td>Total Before Tax:</td> <td>\$26.42</td> </tr> <tr> <td>Estimated Tax:*</td> <td>\$0.00</td> </tr> <tr> <td>Total</td> <td>\$26.42</td> </tr> </table> <p style="text-align: right;">Order Total: \$26.42</p>	Items:	\$20.47	Shipping & Handling:	\$5.95	Total Before Tax:	\$26.42	Estimated Tax:*	\$0.00	Total	\$26.42
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Shipping & Handling:	\$5.95										
Total Before Tax:	\$26.42										
Estimated Tax:*	\$0.00										
Total	\$26.42										

Order Confirmation Page

Table A1.9 Ambivalence Treatment 3

 <p>Product Description 8 NiMH AA rechargeable batteries * each battery rated at 2500mAh *</p> <p>Product Details Product Dimensions: 5 x 1 x 4 Inches ; 1 pounds Shipping Weight: 8 ounces (View shipping rates and policies) Shipping: Currently, item can be shipped only within the U.S. ASIN: B0002DUQCM Item model number: NH15BP-8</p>	 <table border="1"> <thead> <tr> <th>Feedback</th> <th>30 days</th> <th>90 days</th> <th>365 days</th> <th>Lifetime</th> </tr> </thead> <tbody> <tr> <td>Positive</td> <td>99%</td> <td>99%</td> <td>99%</td> <td>99%</td> </tr> <tr> <td>Neutral</td> <td>1%</td> <td>1%</td> <td>1%</td> <td>1%</td> </tr> <tr> <td>Negative</td> <td>0%</td> <td>1%</td> <td>1%</td> <td>1%</td> </tr> <tr> <td>Count</td> <td>248</td> <td>755</td> <td>1746</td> <td>1769</td> </tr> </tbody> </table> <p>Recent Feedback:</p> <ul style="list-style-type: none"> 5 out of 5: "1st one didn't work and they replaced it right away" Date: 4/20/2009 Rated by Buyer: Carmen B. 4 out of 5: "I order 6 new but received used after contcting them they send refund to my visa account" Date: 4/18/2009 Rated by Buyer: Ahmad 5 out of 5: "Great transaction" Date: 4/18/2009 Rated by Buyer: j_loughlin 4 out of 5: "Item meets expectations, but shipping was slow and expensive" Date: 4/18/2009 Rated by Buyer: Rene S. 1 out of 5: "BEWARE: I ordered 5000 papers but only received 500. Called them and they told me they would send me the remains. But 10 days later, nothing arrived. I gave them the 2nd call, they denied their promise. Also, they IIED by stating amazon made the mistake instead of themselves, which is untrue. They promised me again to send the remain.I will give them the last chance before submitting a complaint." Date: 4/10/2009 Rated by Buyer: qu mj 	Feedback	30 days	90 days	365 days	Lifetime	Positive	99%	99%	99%	99%	Neutral	1%	1%	1%	1%	Negative	0%	1%	1%	1%	Count	248	755	1746	1769
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<p>Product Info Page</p>	<p>Customer Review Page</p>																									

Or enter a new shipping address

Be sure to click "Ship to this address" when done.

Full Name:
Address Line1:
Street address, P.O. box, company name, c/o
Address Line2:
Apartment, suite, unit, building, floor, etc.
City:
State/Province/Region:
ZIP/Postal Code:
Country:
Phone Number:
Sexual Orientation:
Mother's Maiden Name:

Info Entry Page

Please review and submit your order

By placing your order, you agree to Amazon.com's privacy notice and conditions of use.

Review the information below, then click "Place your order."

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Total	\$26.42										

Order Confirmation Page

Appendix 3. Factorial Validity and Analysis Support

Assessing Construct Validity

In this section, we assess several key elements of construct validity, including determining which constructs are formative and which are reflective (Diamantopoulos & Winklhofer, 2001); assessing factorial validity as determined by discriminant validity and convergent validity (Straub *et al.*, 2004); evaluating multicollinearity (Cenfetelli & Bassellier, 2009); and checking for common methods bias (Podsakoff *et al.*, 2003). We used partial least squares (PLS), employing SmartPLS version 2.0 (Ringle *et al.*, 2005) for model validation and analysis because PLS is especially adept at validation of mixed models of formative and reflective indicators (Chin *et al.*, 1996; Diamantopoulos & Winklhofer, 2001; Chin *et al.*, 2003; Gefen & Straub, 2005; Lowry & Gaskin, 2014).

Determining which Constructs are Formative and which are Reflective

A key step of preparation for assessing factorial validity is to determine which constructs are formative and which are reflective (Diamantopoulos & Winklhofer, 2001). The basic difference is that items within *formative constructs* are theoretically distinct, and thus cannot be replaced with other items in the same construct; meanwhile, the items in *reflective constructs* are theoretically similar, and thus are replaceable (Diamantopoulos & Winklhofer, 2001). This theoretical and methodological distinction has recently become a serious issue in IS research, where it has been discovered that many previous IS studies were mis-specified because they did not distinguish between reflective and formative constructs (Petter *et al.*, 2007). Such mis-specification can lead to problems in empirical results and theoretical interpretations, including a potential increase in both Type I and Type II errors (Petter *et al.*, 2007).

We used the latest leading recommendations (Diamantopoulos & Winklhofer, 2001; Petter *et al.*, 2007; Cenfetelli & Bassellier, 2009; Lowry & Gaskin, 2014) to determine how to analyse our constructs. Notably, constructs are not inherently reflective or formative; it is up to the researcher and the literature to make that determination and to choose appropriate items for the conceptualisation (MacKenzie *et al.*, 2011). Our conceptualisation and measurement, along with formal model specification, followed the latest conventions (e.g., MacKenzie *et al.*, 2011). Trust and distrust beliefs and the dispositions to trust and distrust have previously been theorised, modelled and validated as second-order constructs, composed of first-order reflective subconstructs (McKnight *et al.*, 1998; McKnight *et al.*, 2004; McKnight & Choudhury, 2006). We have neither theoretical nor methodological reasons to contradict these previous construct conceptualisations, and thus we have validated and modelled our constructs accordingly.

Establishing Factorial Validity

Factorial validity is established through both convergent and discriminant validity, which are two highly interrelated concepts which must coexist. *Convergent validity* is the basic idea that measurement items which should be related are related. It is established 'when items thought to reflect a construct converge, or show significant, high correlations with one another, particularly when compared to the convergence of items relevant to other constructs, irrespective of method' (Straub *et al.*, 2004, p. 391). *Discriminant validity* is the basic idea that items that should not be related are in fact not related. Thus, it can be established when items thought to diverge show insignificant, low correlations with one another, particularly compared to items in other constructs (Straub *et al.*, 2004). Importantly, factorial validity is established in different ways for reflective and formative constructs; thus, we address these analyses separately.

Factorial Validity of Reflective Constructs

To establish the factorial validity of our reflective constructs, we followed procedures by Gefen and Straub (2005) and Lowry *et al.* (2014), and further demonstrated in (Lowry *et al.*, 2008; Lowry *et al.*, 2009). For an especially conservative analysis, we used two established techniques to establish convergent validity and two established techniques to establish discriminant validity.

Convergent Validity of Reflective Constructs. First, we examined the outer model loadings. Convergent validity can be established when the *t*-values of the outer model loadings are significant. In all cases but one (one ambivalence item), each latent variable's indicators strongly converged on the latent variable and was highly significant, as summarised in Table A3.1. As a second check, we correlated the latent variable scores against the indicators as a form of factor loadings, and then examined the indicator loadings and cross-loadings to establish

convergent validity. Although this approach is typically used to establish discriminant validity, convergent validity and discriminant validity are interdependent and help to establish each other. Convergent validity is also established when each loading for a latent variable is substantially higher than those for other latent variables. This is done by correlating the latent variable scores against the indicators as a form of factor loadings. Table A3.2 illustrates the loadings in grey. Based on this analysis, only the same indicator in ambivalence showed poor loading on its intended construct, in comparison to all other constructs.

Discriminant Validity of Reflective Constructs. We also used two approaches to establish discriminant validity. First, like with convergent validity, we examined the factor loadings, but this time, wanted to ensure significant that overlap did not exist between the constructs (see Table A3.2). All loadings, excluding an item from following advice, were appropriate, given the dropped ambivalence indicator in the previous step.

Second, we used the approach of examining the square roots of the average variances extracted (AVEs), as summarised in Table A3.3. The basic standard followed here is that the square root of the AVE for any given construct (latent variable) should be higher than any of the correlations involving the construct. The numbers are shown in the diagonal for constructs (bolded and underlined). Strong discriminant validity was shown for all constructs.

Factorial Validity of Formative Constructs

Establishing factorial validity for formative indicators is more challenging than validating reflective indicators, because the established procedures which exist to determine the validity of reflective measures do not apply to formative measures (Gefen & Straub, 2004; Petter *et al.*, 2007). Moreover, the procedures for validating formative measures are less known or well-established (Diamantopoulos & Winklhofer, 2001), although standards are beginning to emerge in IS research (Cenfetelli & Bassellier, 2009).

Validating items within formative measures is particularly challenging because these items can move in different directions from one another. Whereas reflective indicators must demonstrate considerably high correlations with each other (*i.e.*, high conceptual overlap) to be valid internally, the indicators of a formative construct need not meet this criterion, and instead need to represent distinct facets of the overall construct being modelled (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001; Petter *et al.*, 2007). Reflective items are interchangeable, but formative items are not; hence, reliability measurements are not appropriate for formative constructs (Diamantopoulos & Winklhofer, 2001). Specifically, internal consistency examinations of formative constructs with Cronbach's α and AVE calculations are not methodologically appropriate (Bagozzi, 1994; Marakas *et al.*, 2007; Petter *et al.*, 2007; Cenfetelli & Bassellier, 2009).

Researchers have traditionally used theoretical reasoning alone to support the validity of formative constructs (Diamantopoulos & Winklhofer, 2001). Over time, methodological approaches have emerged to improve the validation of formative constructs, such as the modified multitrait-multimethod approach and assessment of multicollinearity (Straub *et al.*, 2004; Marakas *et al.*, 2007; Petter *et al.*, 2007). This foundation has been improved on in work by Cenfetelli and Bassellier (2009), which we follow for our validation process.

As an initial step, we assessed the absolute indicator contributions (*i.e.*, zero-order correlations) of the individual items for service quality against the overall average of service quality. The idea is to improve internal validity by removing items not exhibiting a significant association with the overall construct (Diamantopoulos & Winklhofer, 2001; Cenfetelli & Bassellier, 2009). All of the items exhibited significant associations with the overall measure at the 0.05 level of significance. We also performed inter-item correlational diagnostics to assess whether there were high correlations among the formative indicators, as these can significantly weaken formative measures (Diamantopoulos & Siguaw, 2006). However, the biggest potential issue that must be addressed is multicollinearity (Cenfetelli & Bassellier, 2009). We thus we assessed the possibility of multicollinearity amongst all of the indicators (reflective and formative) in the model. Variance inflation factors (VIFs) less than 10 are traditionally viewed as justification for a model's lack of multicollinearity, with 5.0 being ideal, but formative methodologists have recently called for a more stringent cut-off of less than 3.3 (Diamantopoulos & Siguaw, 2006; Petter *et al.*, 2007; Cenfetelli & Bassellier, 2009).

A number of concerns emerged from this analysis. While all of the reflective indicators had VIFs of 5.0 or less, a few of the formative indicators were above the more stringent 3.3 cut-off. All such instances were found in trusting beliefs and trusting intentions, but these were second-order formative constructs made up of reflective subconstructs. However, given the extensive use and theory backing the second-order formative nature of these two constructs, we retained them in the model as specified by research, noting that small amounts of multicollinearity may obfuscate the results.

Establishing a Lack of Common-Methods Bias

To diminish the likelihood of common methods bias occurring in our data collection, we randomised items within the instrument so that participants would be less apt to detect underlying constructs, another potential source of common method bias (Cook & Campbell, 1979; Straub *et al.*, 2004). However, all data were collected using a similar-looking online survey; thus, we still needed to test for common methods bias to establish that it was not a likely negative factor in the data remaining for our analysis. We used two approaches to increase validity and rigor.

The traditional approach to establishing lack of common methods bias is to conduct a Harman's single factor test; however, the validity of this approach is increasingly under attack, and thus, we used a couple of stronger methods instead (Podsakoff *et al.*, 2003; Pavlou *et al.*, 2007).

The first approach was suggested by Podsakoff *et al.* (2003), and adapted for PLS by Liang *et al.* (2007). The objective of this technique is to measure the influence of a common latent method factor on each individual indicator in the model versus the influence of each indicator's corresponding construct. To perform this technique in PLS, constructs of the theoretical model and their relationships are modelled as is normally conducted with two major additions: (1) A single-indicator construct is created for each indicator in the measurement model. Each subconstruct is then linked to each of the single-indicator constructs which comprise the subconstruct. This effectively makes each subconstruct in the model a second-order reflective construct. (2) A construct representing the method is created, reflectively composed of all indicators of the instrument. The method construct (the latent method factor) is then linked to each single-item construct. Based on this analysis the average substantively explained variance of the items is .833, while the average method-based variance is -.001. This results in a ratio of 637:1. In addition, most of the relationships between the items and the method-based construct were insignificant—indicating a lack of common-methods bias.

However, this approach by Liang *et al.* (2007) is now under increase dispute as to its effectiveness. Thus, we used a second approach, which to simply examine a correlation matrix of the constructs and determine whether any of the correlations were above 0.90, which would be evidence that common method bias may exist (Pavlou *et al.*, 2007). To be conservative, we conducted this analysis for the constructs and for the subconstructs. All construct correlations were below this threshold.

Manipulation Checks

Two approaches were used for manipulation checks, as follows: (1) asking the participants if they noticed the manipulation and (2) statistical manipulation checks to see whether the treatments provided the desired manipulations. To assess the manipulation validity of the experiment, questions were added to the post-test to determine whether participants perceived their treatment manipulations. This elucidated whether the participants had noticed the process abnormalities, website design abnormalities and informational abnormalities. Table A3.4 shows the results of these manipulation questions. As can be seen, when asked whether participants perceived the manipulations, a majority was aware of it. However, a substantial portion of the manipulations were not perceived/remembered by the participants (see below). Nevertheless, these data were retained because they provide a more realistic test of our data. Straub *et al.* suggest that although unmanipulated participants add additional variance to results, data for these participants may profitably be retained in the dataset to provide 'a more robust testing of the hypotheses' (2004, p. 408).

Several of the manipulations were relatively weak in comparison to the majority that was correctly perceived (the highlights in grey indicate the manipulations that were perceived with less than 50% accuracy). The most frequently under-perceived manipulation was the request for sexual orientation and mother's maiden name (information abnormalities for treatments #4, 7 and 8). This manipulation was only accurately recalled once (treatment #3, 59%). Interestingly, while participants largely did not recall this manipulation, later analysis revealed that this type of abnormality did produce changes in overall trust. This shows that several of our manipulations were subtle, but in the end effective, providing all the more reason to retain all data, not just data which were properly perceived. Perhaps other manipulations of this type of abnormality would be more blatant and produce stronger results (e.g., Everard & Galletta, 2005). The downside of more blatant manipulations is giving up realism.

Two other treatments had less than expected perceived manipulations for informational abnormalities (#5 and 6). For the fifth treatment group, participants did not perceived the subtle shift from an Amazon shopping cart to that of Google, which is akin to a finding in the literature on change blindness (e.g., Levin & Simons, 1997; Silverman & Mack, 2006). *Change blindness* refers to individuals' inability to notice changes in their current settings. Perhaps the change between two of the most major e-commerce shopping carts was too subtle for participants to perceive; again, later analysis indicates an effect from this manipulation despite the participants'

inability to perceive it. Likewise, participants did not correctly recall that no informational abnormalities existed, potentially because various other abnormalities were present. It is possible that the mixed signals in other areas resulted in a faulty recall of this one area that was not anomalous.

Higher than market prices were also incorrectly perceived in two treatment groups (#5 and 7), while they were correctly perceived in two other treatments (#2 and 8). Perhaps since the manipulation of high price was only marginal in comparison to low price, participants incorrectly perceived this manipulation (50% of the total), whereas all low price manipulations were correctly perceived. In the instances where the high price manipulation was not perceived, it is possible that such a manipulation may be due to other abnormalities present in the process which may have interfered with participants' memories regarding price.

Finally, half of the treatment groups incorrectly recalled whether production-related information was being manipulated (treatments #2, 3, 4 and 6). Treatments #2, 3 and 4 incorrectly recalled that information was present about their products, despite the absence of such information (or the inclusion of information focussing deliberately on the wrong product— a car battery). Such inattention to detail may be attributed to the nature of the product being 'purchased' by the participants (*i.e.*, rechargeable AA batteries). As participants are expected to be highly familiar with such items, it is possible that they largely ignored this information, as it would not factor into their buying decision.

Given that large portions of the participant sample were not aware of specific manipulations, this study also relies upon mean comparisons between treatment groups to assess the effectiveness of the manipulations. We conducted several rounds of comparative analysis, summarised in Tables A3.5, A3.6 and A3.7, which establish that the treatments mainly worked in the directions as intended.

The means of the relevant constructs that were manipulated by the treatment groups are shown in Table A3.5. Each of the treatments significantly altered the levels of situational abnormality, which followed the study design. Specifically, the abnormality treatments (#2–5) reported even higher scores for situational abnormalities than the ambivalence treatments (#6–8). Table A3.5 indicates that all abnormality manipulations were significant and in the correct direction.

The same procedure was used to verify the trust manipulations found in treatments #3–5. These results are shown in Tables A3.6 and A3.7. Tables A3.6 and A3.7 indicate that all trust manipulations were significant and in the intended direction. For clarity, the trust dimension is highlighted with the corresponding manipulation, which is expected to be the lowest mean in the given column.

These results indicate that, with the notable exception of the deceit manipulation on integrity, the manipulations tended to produce the most pronounced results in their intended subdimensions of both trust and distrust. However, we note that all manipulations that contained some distrusting or negative cue (*i.e.*, treatments #2–8) resulted in higher levels of distrust when compared with the control treatment. This indicates that the effects of the manipulation for a specific subdimension of distrust tend to bleed over to other subdimensions. This supports the assumption that intra-attribute ambivalence is likely not to be present in such relationships, as trusters do not distinguish between the subdimensions in great detail required for such ambivalence.

A multivariate analysis of variance of our manipulations onto trust, distrust and ambivalence shows that the manipulations significantly affected each of the dimensions of trust, distrust and ambivalence at the $p=0.000$ level with the exception of price. Price showed significant results only with Roy's largest root on these constructs ($R=0.032$, $F=6.0$, $p=0.016$), whereas all other estimates were insignificant (Wilks' $\lambda=0.966$, $F=12.0$, $p=0.148$; Lawley-Hotelling trace=0.0354, $F=12.0$, $p=0.146$; Pillai's trace=0.034, $F=12.0$, $p=0.151$). Although price is not clearly shown to affect the results of trust, distrust or ambivalence, we retain it in our model due to the results shown above, and the significant effects it is found to have on the various dimensions in isolation.

We also regressed the effects of each manipulation of the study on the variables of interest to show the partial effects that each manipulation has on each dimension. The summarised results of these regressions are shown in Table A3.8. We note that the majority of the effects are highly significant.

Table A3.1 Outer-Model Weights *t* values of Reflective Items to Test Convergent Validity

Latent construct	Subdimension	Items	<i>t</i> stat	<i>p</i> value
Ambivalence	nN/A	ambiv1*	0.606	0.545
		ambiv2	6.483	0.000
		ambiv3	6.996	0.000
		ambiv4	61.867	0.000
		ambiv5	4.947	0.000
Trusting intentions (Second-order formative)	Follow advice	fa1	31.263	0.000
		fa2	119.602	0.000
		fa3	45.004	0.000
		fa4	102.207	0.000
		fa5	65.078	0.000
		fa6	55.762	0.000
	Give information	gi1	66.045	0.000
		gi2	14.346	0.000
		gi3	12.202	0.000
	Make purchase	mp1	44.767	0.000
		mp2	184.278	0.000
	Willing to disclose information	wd1	68.255	0.000
		wd2	94.452	0.000
		wd3	77.518	0.000
wd4		64.500	0.000	
Distrusting beliefs (Second-order formative)	Incompetence	incomp1	130.447	0.000
		incomp2	167.900	0.000
		incomp3	144.472	0.000
		incomp4	37.259	0.000
	Malevolence	mal1	104.814	0.000
		mal2	79.079	0.000
		mal3	77.303	0.000
	Deceit	dect1	115.653	0.000
		dect2	98.363	0.000
		dect3	122.894	0.000
Trusting beliefs (Second-order formative)	Benevolence	dect4	120.108	0.000
		ben1	79.134	0.000
		ben2	78.961	0.000

Competence	ben3	51.032	0.000
	comp1	93.572	0.000
	comp2	115.794	0.000
	comp3	135.397	0.000
Integrity	comp4	36.016	0.000
	int1	101.225	0.000
	int2	84.795	0.000
	int3	75.566	0.000
	int4	84.791	0.000

* Poor loading

Table A3.2 Items in Latent Variable Analysis for Discriminant Validity

Indicators	Ambivalence	Follow advice	Give info	Make purchase	Willing to disclose info	Malevolence	Incompetence	Deceit	Benevolence	Competence	Integrity
ambiv1	0.083	-0.115	-0.162	-0.116	-0.073	-0.129	-0.058	-0.073	0.097	0.069	0.112
ambiv2	0.655	0.122	-0.011	0.112	0.151	0.119	0.174	0.160	-0.064	-0.143	-0.125
ambiv3	0.659	0.137	-0.051	0.062	0.133	0.112	0.159	0.147	-0.087	-0.137	-0.130
ambiv4	0.955	0.508	0.223	0.421	0.529	0.485	0.550	0.516	-0.347	-0.470	-0.435
ambiv5	0.518	0.072	-0.031	0.063	0.088	0.110	0.128	0.138	-0.038	-0.092	-0.066
fa1	0.391	0.740	0.413	0.581	0.704	0.541	0.574	0.516	-0.476	-0.539	-0.534
fa2	0.396	0.919	0.513	0.683	0.784	0.615	0.695	0.645	-0.549	-0.647	-0.593
fa3	0.321	0.850	0.426	0.558	0.635	0.494	0.553	0.528	-0.445	-0.536	-0.469
fa4	0.391	0.909	0.462	0.615	0.707	0.568	0.636	0.593	-0.501	-0.606	-0.537
fa5	0.398	0.914	0.492	0.653	0.722	0.594	0.668	0.633	-0.533	-0.643	-0.575
fa6	0.484	0.851*	0.442	0.724	0.766	0.668	0.788	0.713	-0.553	-0.693	-0.623
gi1	0.172	0.479	0.864	0.579	0.451	0.446	0.450	0.420	-0.333	-0.370	-0.349
gi2	0.124	0.285	0.602	0.334	0.303	0.207	0.201	0.205	-0.220	-0.281	-0.257
gi3	0.079	0.331	0.620	0.276	0.242	0.235	0.206	0.191	-0.300	-0.282	-0.251
mp1	0.235	0.500	0.511	0.833	0.480	0.460	0.512	0.499	-0.357	-0.405	-0.388
mp2	0.403	0.757	0.527	0.916	0.718	0.639	0.728	0.668	-0.573	-0.670	-0.626
wd1	0.398	0.739	0.458	0.636	0.873	0.571	0.647	0.593	-0.491	-0.581	-0.557
wd2	0.430	0.719	0.411	0.589	0.894	0.615	0.630	0.613	-0.541	-0.604	-0.590
wd3	0.413	0.729	0.407	0.593	0.901	0.612	0.652	0.629	-0.567	-0.601	-0.589
wd4	0.427	0.736	0.432	0.645	0.841	0.557	0.648	0.584	-0.497	-0.640	-0.564
mal1	0.399	0.584	0.363	0.576	0.573	0.899	0.710	0.799	-0.477	-0.531	-0.521
mal2	0.439	0.629	0.424	0.580	0.632	0.874	0.717	0.754	-0.499	-0.523	-0.505
mal3	0.329	0.558	0.384	0.530	0.564	0.864	0.661	0.715	-0.507	-0.469	-0.511
incomp1	0.477	0.720	0.409	0.694	0.702	0.736	0.935	0.775	-0.444	-0.585	-0.531

incomp2	0.483	0.704	0.387	0.687	0.702	0.732	0.936	0.783	-0.458	-0.600	-0.538
incomp3	0.476	0.691	0.371	0.672	0.677	0.729	0.934	0.814	-0.452	-0.591	-0.546
incomp4	0.360	0.606	0.396	0.543	0.556	0.656	0.790	0.683	-0.423	-0.545	-0.488
dect1	0.448	0.654	0.398	0.636	0.634	0.785	0.797	0.916	-0.505	-0.567	-0.587
dect2	0.416	0.645	0.376	0.607	0.628	0.790	0.766	0.919	-0.493	-0.538	-0.573
dect3	0.446	0.610	0.349	0.627	0.628	0.787	0.777	0.908	-0.501	-0.564	-0.568
dect4	0.429	0.661	0.380	0.616	0.637	0.796	0.774	0.923	-0.485	-0.583	-0.558
ben1	-0.292	-0.534	-0.380	-0.497	-0.531	-0.505	-0.438	-0.491	0.902	0.705	0.748
ben2	-0.292	-0.530	-0.373	-0.502	-0.549	-0.484	-0.457	-0.467	0.885	0.698	0.741
ben3	-0.235	-0.490	-0.310	-0.442	-0.494	-0.494	-0.404	-0.470	0.850	0.619	0.707
comp1	-0.397	-0.651	-0.430	-0.568	-0.625	-0.527	-0.585	-0.562	0.692	0.901	0.772
comp2	-0.431	-0.651	-0.394	-0.578	-0.642	-0.559	-0.613	-0.597	0.698	0.930	0.781
comp3	-0.409	-0.665	-0.400	-0.600	-0.654	-0.519	-0.596	-0.575	0.714	0.926	0.787
comp4	-0.267	-0.533	-0.345	-0.496	-0.520	-0.439	-0.480	-0.429	0.612	0.778	0.647
int1	-0.346	-0.584	-0.378	-0.561	-0.620	-0.557	-0.531	-0.569	0.782	0.755	0.907
int2	-0.390	-0.599	-0.359	-0.545	-0.586	-0.515	-0.548	-0.561	0.734	0.763	0.910
int3	-0.352	-0.574	-0.357	-0.565	-0.581	-0.505	-0.528	-0.552	0.725	0.783	0.887
int4	-0.357	-0.551	-0.377	-0.474	-0.566	-0.516	-0.492	-0.558	0.751	0.738	0.890

* Item has insignificant loading or higher loading on non-related construct

Table A3.3 AVE Analysis to Establish Discriminant Validity

Constructs	Ambivalence	Benevolence	Competence	Deceit	Follow advice	Give info	Incompetence	Integrity	Make purchase	Malevolence	Willing to disclose info
Ambivalence	<u>0.640</u>										
Benevolence	-0.311	<u>0.879</u>									
Competence	-0.428	0.768	<u>0.886</u>								
Deceit	0.474	-0.541	-0.614	<u>0.917</u>							
Follow advice	0.459	-0.590	-0.708	0.701	<u>0.866</u>						
Give info	0.184	-0.404	-0.444	0.410	0.531	<u>0.705</u>					
Incompetence	0.501	-0.493	-0.644	0.849	0.756	0.433	<u>0.901</u>				
Integrity	-0.402	0.833	0.845	-0.623	-0.643	-0.409	-0.584	<u>0.898</u>			
Make purchase	0.378	-0.547	-0.634	0.678	0.736	0.591	0.723	-0.597	<u>0.875</u>		
Malevolence	0.444	-0.562	-0.578	0.861	0.672	0.444	0.792	-0.583	0.640	<u>0.879</u>	
Willing to disclose info	0.475	-0.597	-0.691	0.689	0.833	0.487	0.734	-0.655	0.702	0.671	<u>0.878</u>

Table A3.4 Summary of Manipulation Checks – Qualitative Assessment

Treatment #	Manipulation	Expected	Correct?	Wrong?	Unsure?	Total
1	Product info	Normal	81% (54)	3% (2)	16% (11)	67
	Price	Normal	81% (54)	3% (2)	16% (11)	67
	Reviews	Positive	96% (64)	3% (2)	1% (1)	67
	Reviews	Absent	73% (49)	7% (5)	18% (12)	66
	Information	Normal	72% (48)	16% (11)	12% (8)	67
2	Product info	Abnormal	27% (15)	57% (32)	16% (9)	56
	Price	Abnormal	54% (30)	18% (10)	29% (16)	56
	Reviews	Absent	86% (48)	2% (1)	13% (7)	56
	Reviews	Absent	88% (49)	0% (0)	13% (7)	56
	Information	Normal	55% (31)	18% (10)	27% (15)	56
3	Product info	Abnormal	49% (31)	38% (24)	13% (8)	63
	Price	Abnormal	65% (41)	24% (15)	10% (6)	62
	Reviews	Positive	76% (48)	19% (12)	5% (3)	63
	Reviews	Negative present	95% (60)	0% (0)	3% (2)	62
	Information	Abnormal	59% (37)	24% (15)	17% (11)	63
4	Product info	Abnormal	48% (29)	34% (21)	18% (11)	61
	Price	Abnormal	59% (36)	26% (16)	15% (9)	61
	Reviews	Positive	62% (38)	30% (18)	8% (5)	61
	Reviews	Negative present	93% (57)	3% (2)	3% (2)	61
	Information	Abnormal	48% (29)	28% (17)	25% (15)	61
5	Product info	Abnormal	52% (30)	29% (17)	19% (11)	58
	Price	Abnormal	36% (21)	41% (24)	22% (13)	58
	Reviews	Positive	88% (51)	7% (4)	7% (4)	59
	Reviews	Negative present	95% (55)	2% (1)	5% (3)	59
	Information	Abnormal	34% (20)	40% (23)	26% (15)	58
6	Product info	Normal	49% (34)	26% (18)	25% (17)	69
	Price	Normal	72% (50)	4% (3)	23% (16)	69
	Reviews	Positive	90% (62)	4% (3)	6% (4)	69
	Reviews	Negative present	91% (63)	1% (1)	7% (5)	69
	Information	Normal	48% (33)	25% (17)	28% (19)	69
7	Product info	Normal	72% (49)	12% (8)	15% (10)	67
	Price	Abnormal	45% (30)	30% (20)	25% (17)	67
	Reviews	Positive	91% (61)	7% (5)	1% (1)	67
	Reviews	Negative present	94% (63)	4% (3)	1% (1)	67
	Information	Abnormal	48% (32)	28% (19)	24% (16)	67
8	Product info	Normal	68% (48)	17% (12)	15% (11)	71
	Price	Abnormal	51% (36)	28% (20)	21% (15)	71
	Reviews	Positive	93% (66)	4% (3)	3% (2)	71
	Reviews	Negative present	92% (65)	4% (3)	4% (3)	71
	Information	Abnormal	48% (34)	24% (18)	27% (19)	71

Table Key:

- Expected: the type of manipulation being employed for that part of the study.
- Correct: the percentage (number) of participants that correctly identified the manipulation in the expected direction.
- Wrong: the percentage (number) of participants that incorrectly specified the manipulation in the unexpected direction.
- Unsure: the percentage (number) of participants that indicated they were unsure of any manipulation of that particular type in the study
- Total: total number of responses.
- Highlighted row indicates a manipulation type which was not correctly identified by the majority of participants presented with that type of manipulation.

Table A3.5 Summary of Situational Abnormality Manipulation Tests

#	SA—Design			SA—Info			SA—Product			SA—General		
	Mean	SSD	<i>t</i>	Mean	SSD	<i>t</i>	Mean	SSD	<i>t</i>	Mean	SSD	<i>t</i>
1	2.985	1.089	---	3.183	1.206	---	2.817	1.145	---	3.300	1.201	---
2	4.304	1.126	8.52	4.794	1.464	8.23	3.432	1.547	2.98	4.753	1.349	8.06
3	4.501	1.248	9.64	4.625	1.302	8.79	4.042	1.387	7.01	5.118	1.209	11.93
4	4.623	1.164	10.99	4.586	1.102	9.94	4.482	1.320	9.85	4.964	1.167	11.14
5	3.899	1.281	5.38	4.559	1.388	7.61	3.856	1.458	5.48	4.982	1.391	9.28
6	3.660	1.164	4.81	4.154	1.207	6.68	3.653	1.410	4.93	4.951	1.284	10.68
7	3.792	0.945	8.04	3.898	1.220	4.79	3.920	1.240	7.28	4.639	1.130	9.70
8	3.966	1.012	8.17	4.199	1.150	7.44	3.895	1.449	6.27	4.640	1.366	8.32
All	3.949	1.223	---	4.225	1.338	---	3.758	1.436	---	4.656	1.370	---

Table A3.6 Summary of Trust Manipulations

Treat .#	Benevolence				Competence				Integrity			
	Mean	SD	<i>t</i>	<i>p</i>	Mean	SD	<i>t</i>	<i>p</i>	Mean	SD	<i>t</i>	<i>p</i>
1	2.325	0.068	n/a	n/a	2.726	0.070	n/a	n/a	2.576	0.072	n/a	n/a
2	1.729	0.085	5.497	0.000	1.832	0.084	8.287	0.000	1.754	0.081	7.798	0.000
3	1.719	0.075	6.005	0.000	1.751	0.085	8.962	0.000	1.731	0.085	7.775	0.000
4	1.650	0.074	6.714	0.000	1.797	0.071	9.456	0.000	1.752	0.079	7.918	0.000
5	1.729	0.084	5.504	0.000	1.812	0.094	7.897	0.000	1.740	0.089	7.459	0.000
6	1.773	0.074	5.482	0.000	1.839	0.075	8.781	0.000	1.810	0.082	7.204	0.000
7	1.949	0.083	3.503	0.001	2.129	0.085	5.473	0.000	1.964	0.077	5.982	0.000
8	1.737	0.069	6.070	0.000	2.017	0.072	7.141	0.000	1.869	0.067	7.427	0.000

1=control, 2=abnormal, 3=incompetence, 4=malevolence, 5=deceit, 6=ambiv. 1, 7=ambiv. 2, 8=ambiv. 3

Table A3.7 Summary of Distrust Manipulations

Treat #	Malevolence				Incompetence				Deceit			
	Mean	SD	<i>t</i>	<i>p</i>	Mean	SD	<i>t</i>	<i>p</i>	Mean	SD	<i>t</i>	<i>p</i>
1	1.874	0.078	n/a	n/a	1.522	0.081	n/a	n/a	1.672	0.086	n/a	n/a
2	2.664	0.113	5.746	0.000	2.717	0.130	7.805	0.000	2.718	0.121	7.030	0.000
3	2.727	0.089	7.221	0.000	2.937	0.089	11.753	0.000	2.856	0.090	9.486	0.000
4	2.735	0.102	6.713	0.000	2.736	0.102	9.327	0.000	2.829	0.092	9.181	0.000
5	2.823	0.119	6.685	0.000	2.719	0.123	8.125	0.000	2.865	0.132	7.589	0.000
6	2.775	0.086	7.765	0.000	2.791	0.087	10.708	0.000	2.864	0.085	9.855	0.000
7	2.466	0.087	5.070	0.000	2.416	0.095	7.160	0.000	2.446	0.093	6.114	0.000
8	2.522	0.073	6.039	0.000	2.430	0.084	7.806	0.000	2.530	0.077	7.434	0.000

1=control, 2=abnormal, 3=incompetence, 4=malevolence, 5=deceit, 6=ambiv. 1, 7=ambiv. 2, 8=ambiv. 3

Table A3.8 Regression Results of Manipulations on Trust and Distrust Dimensions and Ambivalence

Manipulation	Benevolence			Malevolence			Competence		
	Cβ	<i>t</i>	<i>p</i>	CB	<i>t</i>	<i>p</i>	Cβ	<i>t</i>	<i>p</i>
Product-based error	-0.078	-2.19	0.029	0.161	3.73	0.000	-0.176	-4.70	0.000
Price	-0.097	-2.79	0.006	0.152	3.61	0.000	-0.136	-3.71	0.000
Pos. review	0.233	4.32	0.000	-0.237	-3.65	0.000	0.278	4.93	0.000
Neg. review	-0.329	-6.62	0.000	0.411	6.87	0.000	-0.393	-7.56	0.000
Info-based error	0.066	1.86	0.063	-0.050	-1.17	0.244	0.105	2.82	0.005
Constant	1.859	14.67	0.000	2.392	15.63	0.000	2.146	16.16	0.000

Manipulation	Incompetence			Integrity			Deceit		
	Cβ	<i>t</i>	<i>p</i>	Cβ	<i>t</i>	<i>p</i>	Cβ	<i>t</i>	<i>p</i>
Product-based error	0.214	4.63	0.000	-0.118	-3.19	0.002	0.210	4.62	0.000
Price	0.153	3.38	0.001	-0.122	-3.38	0.001	0.127	2.86	0.004
Pos. review	-0.397	-5.69	0.000	0.266	4.76	0.000	-0.369	-5.37	0.000
Neg. review	0.567	8.83	0.000	-0.362	-7.02	0.000	0.538	8.53	0.000
Info-based error	-0.142	-3.08	0.002	0.091	2.46	0.014	-0.086	-1.90	0.058
Constant	2.440	14.89	0.000	1.991	15.13	0.000	2.441	15.14	0.000

Manipulations

The manipulations targeted process, information and website design abnormalities (*i.e.*, mistakes). Each was manipulated as *present* – containing the listed errors, or *absent*– having no such errors. It was not the purpose of this study to explore what specific error causes what changes in a trust or distrust subdimension, but rather to ascertain that such a line of inquiry would be beneficial for future research. Based on previous literature (Everard & Galletta, 2005; Ou & Sia, 2010) and the results of our first pilot study, we identified the three general types of abnormalities that can be present on websites.

1. Process abnormality: an aspect of the typical buying process is disrupted.
 - Present: The buying process involves providing additional information that is not usually collected (*e.g.*, mother’s maiden name, sexual orientation)
 - Absent: Shopping cart with credit card payment option as typically offered through most sites
2. Information abnormality: information regarding the desired item/service is abnormal.
 - Present: Extremely low or high price in comparison to listed other sellers, missing product description, highly negative review and rating score, product description and name do not match

- displayed picture, or no sales history for the given seller
 - Absent: Comparable price to other listed sellers, commonly available description, expected customer reviews and ratings (average for sellers of this product)
3. Website design abnormality: can include extremely poor website design, errors and/or broken links that are not specifically relevant to the product/service information.
- Present: Frequent and blatant misspellings, look-and-feel of webpage changes during the process
 - Absent: Consistent appearance throughout the entire process

Distrust manipulations consists of three levels: malevolence, incompetence and deceit. These were manipulated by providing customer feedback on the feedback page of the experiment which specifically manipulated that dimension only.

More Details on Experimental Description

Participants were recruited from the two readily available subject pools at a large, public eastern US university. Initially, they were asked to complete a pre-experiment survey to gather stable personality characteristics (*e.g.*, demographics, Internet experience and the dispositions to trust and distrust). Once participants completed the initial survey, they proceeded to an online survey containing the experimental manipulations, manipulation checks and post-manipulation survey.

Participants were told to imagine that they were buyers of a given product (*i.e.*, battery pack) and that a given search provided the following scenario. They were asked to review the indicated screenshots and to respond to several questions concerning the attitudes and intentions that they would have if they had been making such a purchase. Each webpage was listed and described in the order that it appeared (screen shots of the webpages are given in Appendix 2).

First, participants viewed the main product page for the item that he or she was purchasing. This page contained an item picture, price, description and so on normally found on a product page. An initial view of the page was presented; then, additional zoomed-in portions of the page were presented to ensure that subjects became familiar with the information there (*i.e.*, product description, price and seller information).

Second, customer reviews and ratings were displayed along with several comments from previous customers, such as those commonly found on Amazon.com. Like the product information page, portions of the customer ratings were zoomed in to increase the likelihood of subjects being familiar with those portions of that page.

Third, subjects were shown a buyer's information page, which requested personal and shipping information.

Fourth, subjects were shown a page where buyers would enter credit card and billing information. Finally, they were then shown a product confirmation page, which summarised the item, price, shipping and billing information.

To increase the likelihood of coexisting rival attitudes and potential ambivalence, several different yet important product attributes and dimensions were manipulated to be either normal or abnormal. Following research in ambivalence, several versions of the purchase process were utilised to focus on an overall attempted manipulation for normality, abnormality and ambivalence rather than focussing on specific manipulations of website factors. The abnormality manipulation groupings are summarised in Table A3.9.

Finally, subjects proceeded to the instruments to respond to questions about distrusting and trusting beliefs, intentions and ambivalence in regards to this situation if they imagined themselves being buyers in this situation. They were also asked to provide their intentions concerning the seller and the website.

Table A3.9 Summary of Experimental Manipulations

Treatment condition	Normal features		Abnormal features			Ambivalent features		
	(1) Normal	(2) Abnormal	(3) Incompetence	(4) Malevolence	(5) Deceit	(6) Ambiv. 1	(7) Ambiv. 2	(8) Ambiv. 3
Process	Normal	Change to Google look and feel	Sexual orientation Maiden name	Sexual orientation Maiden name	Change to Google look and feel	Normal	Sexual orientation Maiden name	Sexual orientation Maiden name
Website design	Normal	Wrong pic.	Misspellings	Misspellings	Wrong pic.	Misspellings Wrong pic.	Normal	Normal
Informational	Normal	Price high Wrong prod. desc. No ratings	Low price Missing prod. desc. Incomp. rating	Low price Missing prod. desc. Malev. rating	Price high Wrong prod. desc. Deceit ratings	Normal price Right prod. desc. Deceit rating	High price Right prod. desc. Incomp. rating	High price Right prod. desc. Malev. rating

ENDNOTES

ⁱ *Trusting beliefs* is composed of three subconstructs, namely benevolence, competence and integrity (McKnight *et al.*, 2002). *Benevolence* is exhibited by an organisation that cares about the individual and attempts to act in his/her best interests. *Competence* is exhibited by an organisation that has the capability to perform the desired behaviour. Finally, a firm with high *integrity* is honest in its interactions with the individual and will fulfil its promises to him/her.

ⁱⁱ This body of literature defines *feelings* as the emotional response and attachments which an individual ascribes to other individuals or objects (Kachadourian *et al.*, 2005); *beliefs* are the logically held information regarding the characteristics of other individuals or objects (Kachadourian *et al.*, 2005). *Feelings* thus involve affect, whereas *beliefs* involve cognition; thus, these concepts can also be referred to as *affective beliefs* and *cognitive beliefs* (Trafimow & Sheeran, 1998). Finally, *behaviours* are actions that are performed by an individual (Kachadourian *et al.*, 2005) that are intended to reflect the held feelings and beliefs of the individual.

ⁱⁱⁱ For example, an online consumer can have trust in the TurboTax® website (the trustee) and believe that it has competent advice to assist consumers in the completion and filing of an accurate tax return. However, a consumer may simultaneously distrust advice from the website regarding money management software, largely because the company sells a product in that category. Thus, the proper response to whether an online consumer trusts the organisation should not be ‘yes’ or ‘no’ but ‘to do what?’ (Hardin, 1993). In complex relationships, which only magnify when introducing organisations as the object of trust, it is most important to refer to specifics to understand whether a consumer trusts an organisation via its website. For example, consumers are likely to trust that online orders to Apple’s iTunes online store will be conducted without risking their future credit card transactions on other websites. However, they might also believe that their shopping history on the iTunes store might result in future target marketing. The various facets that make up a relationship allow trust and distrust to coexist, and thus support the bidimensional model of trust and distrust.

^{iv} For example, if an online consumer believes that Amazon.com will ship a purchased item in a timely manner, the consumer cannot also believe the item will not be shipped in a timely manner. Information that is used to form the positive or negative expectations that will lead to trust or distrust cannot be inherently contradictory: Either the information will lead to a positive expectation that the trustee will perform some exact behaviour (*e.g.* ship an item), or it will lead to a negative expectation (*e.g.* not ship the item).

^v For example, consumers of Delta Airlines will value information regarding Delta Airlines from the official website differently than information posted on websites such as DeltaReallySucks.com or other travel review websites.

^{vi} For example, a consumer who uses YouSendIt.com for the transmission of files to various colleagues around the globe might believe that the organisation is able to receive and host these files. By using the service, the consumer accepts this belief and disregards the potential negative belief that the organisation is not able to receive and host the same files. Ultimately, the consumer either believes that the organisation is competent or incompetent in relation to this action. The various cues that are present on the website can be used to form both trust and distrust towards YouSendIt.com.

^{vii} *Ability* is defined by the subdimensions *competence* and *incompetence*. *Ability* forms the assessment of the seller’s proficiency (or lack thereof) to complete a given task (*i.e.*, competence and incompetence).

^{viii} *Orientation* is defined by the subdimensions *benevolence* and *malevolence*. *Orientation* is the idea that the seller intends to do harm or good to the buyer.

^{ix} *Dependability* is defined by the subdimensions *integrity* and *deceit*. *Dependability* is the notion that a buyer expects a seller to adhere to a set of guiding principles of being honest, or expects the seller to deceive him or her.

^x Of the subjects, 59% were male and 41% female. The average age was 28.1 years, with a standard deviation of 5.6. The respondents reported an average of 7.1 completed collegiate semesters, with a standard deviation of 1.9.

^{xi} The use of such participants for this type of study follows the precedents set forth in past e-commerce research (Dinev & Hart, 2006; Pavlou & Fygenson, 2006; Lowry *et al.*, 2008; Parboteeah *et al.*, 2009; Lowry *et al.*, 2012). Participants in this young but educated demographic had extensive experience with e-commerce, the Internet, and various computing technologies – particularly as users and consumers – which qualifies them as excellent targets for this study.

^{xii} Because of the nature of formative measures, reliability checks cannot be reasonably made for formative measures (Diamantopoulos & Winklhofer, 2001). To establish reliability, which refers to the degree to which a scale yields consistent and stable measures over time (Straub, 1989), PLS computes a composite reliability score as part of its integrated model analysis. This score is a more accurate measurement of reliability than Cronbach's α because it does not assume that loadings or error terms of the items to be equal (Chin *et al.*, 2003). However, as a conservative check, Cronbach's α can also be used as a basis of comparison (Fornell & Larcker, 1981; Nunnally & Bernstein, 1994).

^{xiii} The height of the dependent variable (z) is represented by the graphical display, and augmented with colour. Warmer colours (those near the red spectrum) represent higher scores for the dependent variable, while the cooler colours (those near the blue spectrum) represent lower scores.