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Trust and Distrust Scale Development: Operationalization and Instrument Validation

John D. Rusk
Kennesaw State University

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TRUST AND DISTRUST SCALE DEVELOPMENT: OPERATIONALIZATION AND
INSTRUMENT VALIDATION

By
John D. Rusk

A Dissertation

Presented in Fulfillment for the
Degree of
Doctor of Business Administration
In the
Coles College of Business
Kennesaw State University

Kennesaw, GA
2018

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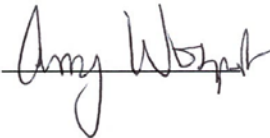
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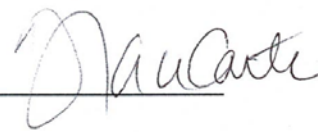
DBA Candidate: John D. Rusk (Cohort 5, Information Systems)

The content and format of the dissertation are appropriate and acceptable for the awarding of the degree of Doctor of Business Administration.


Amy Woszczyński, PhD
Committee Chair
Professor of Information Systems
Coles College of Business
Kennesaw State University

Signature: 

Traci Carte, PhD
Committee Member
Chair and Associate Professor of Information Systems
Coles College of Business
Kennesaw State University

Signature: 

Saurabh Gupta, PhD
Committee Reader
Associate Professor of Information Systems
Coles College of Business
Kennesaw State University

Signature: 

Juanne V. Greene
Clinical Assistant Professor of Management
Director, KSU DBA Program
Coles College of Business
Kennesaw State University

Signature: 

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ABSTRACT

TRUST AND DISTRUST SCALE DEVELOPMENT: OPERATIONALIZATION AND INSTRUMENT VALIDATION

By

John D. Rusk

Trust and distrust have been studied at great length by researchers in the field of information systems and various other fields over the past few decades without reaching consensus on conceptualization and measurement. The goal of this study was to determine if individual trust and distrust are separate constructs or opposite ends of the same continuum. To this end, based on theoretical rationale, an aggregation of extant, validated trust and distrust instruments combined with newly created trust and distrust items were used as input into a rigorous Q-sorting procedure. The Q-sorting process led to the first contribution of this research: a determination that individual trust and distrust are separate and distinct variables and should be measured individually. An empirical field test was then distributed to test the effects of trust and distrust on a downstream variable within the nomological network of trust and distrust, willingness to transact. Over 100 undergraduate students, who are considered to be digital natives, responded to the survey. Through exploratory and confirmatory analyses, the list of 38 items from the Q-sort was narrowed to a parsimonious set of 20 items, exhibiting content, construct, convergent, and discriminant validity. The creation of a list of items to measure individual trust and distrust is the second major contribution of this research. Post-hoc

analyses showed significant main effects of trust and distrust, in the theorized directions, on willingness to transact. Additional post-hoc analysis based on quadrant membership, as described by Lewicki et al. (1998), and IT artifact, yielded too few results to make interpretations. Further, since this study made no hypotheses a priori, the post-hoc analyses should be interpreted with caution. Path analysis should be re-examined in future studies with theoretically developed hypotheses. Finally, since exploratory and confirmatory analyses were performed on the same data set, the results should be re-evaluated in the context of a larger, more diverse sample, to further add to the body of knowledge surrounding individual trust and distrust.

Keywords: individual trust, individual distrust, scale development, operationalization, quadrants, instrument validation, Q-sort procedure, PLS-SEM, K-means, PLS-MGA

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CHAPTER 1 INTRODUCTION

As a core component of human relationships, trust and distrust are important concepts that warrant review and refinement over time. Lewicki et al. (1998) defined trust and distrust as separate and distinct constructs, with trust referring to “confident positive expectations regarding another's conduct” (p. 439) and distrust as “confident negative expectations regarding another's conduct” (p. 440). Thus, trust represents concepts such as benevolence, competence, and integrity, while distrust represents concepts such as malevolence, incompetence, and deceit (Moody, Galletta, and Lowry, 2014). While these definitions are different, they do not unequivocally specify how trust and distrust should be measured on separate scales. The only difference between the two definitions is whether the expectations regarding the other’s conduct are positive or negative. If trust is positive and distrust is negative along the same continuum, then researchers would only need to measure one or the other (Rotter, 1971; Singh and Sirdeshmukh, 2000).

However, Lewicki and colleagues’ (1998) analysis goes further, theorizing a model with high/low levels of trust, combined with high/low levels of distrust, in the theoretical framework titled “Integrating Trust and Distrust: Alternative Social Realities”, as shown in Figure 1¹. They conceptualize that a lack of trust does not necessarily imply

¹ Lewicki, McAllister, and Bies (1998) originally called this graphic a table. Various researchers since then have inconsistently referred to this graphic as either a table or a figure. Lewicki, Tomlinson, and Gillespie (2006) later referred to this same graphic as a figure. Following commonly accepted naming conventions, this thesis refers to it as a figure.

Integrating Trust and Distrust: Alternative Social Realities

High Trust Characterized by Hope Faith Confidence Assurance Initiative	High-value congruence Interdependence promoted Opportunities pursued New initiatives	Trust but verify Relationships highly segmented and bounded Opportunities pursued and down-side risks/vulnerabilities continually monitored
	2 4 1 3	Low Trust Characterized by No hope No faith No confidence Passivity Hesitance
	Low Distrust Characterized by No fear Absence of skepticism Absence of cynicism Low monitoring No vigilance	High Distrust Characterized by Fear Skepticism Cynicism Wariness and watchfulness Vigilance

Figure 1 "Integrating Trust and Distrust: Alternative Social Realities" as published by Lewicki, McAllister, and Bies (1998) as their Table 1

high levels of distrust; similarly, high levels of trust do not imply low levels of distrust.

Instead, the combinations of high/low trust/distrust are more meaningful when

developing theoretical models and predicting relationships and outcomes. With trust

listed on the left, vertical axis and distrust listed on the lower, horizontal axis, the low and high measures of each combine to form a 2x2 matrix of simultaneous trust and distrust.

Keywords for the characteristics of each measure of trust and distrust and for each

quadrant of the matrix are shown in their respective areas of the figure. This paper adopts

the terminology and proposed quadrant numbering from Lewicki et al. (1998) for consistency, while greatly expanding upon the original work.

When originally proposed in 1998, the concept of simultaneous trust and distrust was revolutionary. Research prior to that time typically considered trust and distrust to be opposite ends of a single continuum (Rotter, 1971). The groundbreaking model proposed by Lewicki et al. (1998) was the first to theorize that trust and distrust are different constructs that can occur simultaneously. The model developed relies on sound, well-tested previous research, is intuitive, and has been widely used for research studies in management (Sanchez-Franco, Ramos, and Velicia, 2009), IS (Paul and McDaniel, 2004), and psychology (Elangovan, Auer-Rizzi, and Szabo, 2015; Rousseau, Sitkin, Burt, and Camerer, 1998). In hindsight, it seems almost obvious that simultaneous trust and distrust exist together at various levels – yet no one proposed the integration of simultaneous trust and distrust prior to Lewicki and his colleagues.

In their framework, Lewicki et al. (1998) numbered the four cells as shown in Figure 1, but did not give the cells names. As Table 1 shows, other researchers have attempted to renumber the cells in a different pattern (Adams, 2004; Mascarenhas et al., 2006) while citing Lewicki et al. (1998), and even while specifically citing the graphic shown as Figure 1, which adds unnecessary confusion. In this paper, the pattern will follow the original numbering by Lewicki et al. (1998), and the cells will be called quadrants as other researchers have done (Adams, 2004; Benamati, Serva, and Fuller, 2006; Mascarenhas et al., 2006; McKnight, Kacmar, and Choudhury, 2004; Ou and Sia, 2009).

Several naming proposals have appeared since the original authors published the quadrants without associated names, as shown in Table 1; however, there has been no agreement among scholars. While Lewicki et al. (1998) originally proposed naming each of the combinations of low and high trust and distrust as Cells 1-4, others have referred to the cells as Quadrants 1-4 (Adams, 2004; Mascarenhas et al., 2006), although the numbering of the quadrants has not been consistent across studies. While some researchers have proposed naming the quadrants without adding any meaningful identifying information, others have used names such as friend and enemy (Adams, 2004), which do not necessarily generalize to IS and business contexts. Benamati and colleagues did not use quadrants or cells to define the high and low levels of trust and distrust, instead developing two different naming conventions in articles published in 2006 and 2007 (Benamati and Serva, 2007; Benamati et al., 2006); terms used to define each cell or quadrant included detachment, ambivalence, and suspicion, constructs which are themselves not clearly defined in the trust/distrust literature (Deutsch, 1958; Jarvenpaa and Majchrzak, 2010; McKnight and Chervany, 2001; Moody et al., 2014). This study seeks to bring clarity to studies of high and low levels of trust and distrust, referring to each of the cells as Quadrants 1-4 and using meaningful names that can be used for future business and IS contexts, thus providing a consistent method of referencing the cells in the 2x2 matrix, using clear, unambiguous terminology. Quadrant 1, where trust and distrust are both low, will be called indifference. Quadrant 2, where trust is high and distrust is low, will be called reliance. Quadrant 3, where trust is low and distrust is high, will be called wariness. Quadrant 4, where trust is high and distrust is

Table 1 Quadrant Name and Number Conventions of Trust and Distrust Integration

Quadrant Naming and Numbering Conventions of Trust and Distrust Integration				
	Low Trust / Low Distrust	High Trust / Low Distrust	Low Trust / High Distrust	High Trust / High Distrust
Lewicki et al., 1998	Cell 1	Cell 2	Cell 3	Cell 4
Adams, 2004	Q3, Wait and See	Q1, Friend	Q4, Enemy	Q2, Trust but Verify
Mascarenhas et al., 2006	Quadrant 3	Quadrant 4	Quadrant 1	Quadrant 2
Benamati et al., 2006	Detachment	Blind Trust	Blind Distrust	Bounded Trust
Benamati and Serva, 2007	Ambivalence	Blind Trust	Blind Suspicion	Bounded Trust
This study	Quadrant 1, Indifference	Quadrant 2, Reliance	Quadrant 3, Wariness	Quadrant 4, Conflition

high, will be called conflition. This paper provides a valuable contribution to the field by naming the quadrants with intuitive and meaningful labels for ease of reference while retaining the original cell numbering pattern used by Lewicki et al. (1998).

However, even though prior research on trust and distrust indicates the importance of studying them concurrently (Benamati et al., 2006; Dimoka, 2010; Lewicki, McAllister, and Bies, 1998; McKnight and Choudhury, 2006), few meaningful models to date have theoretically tested trust and distrust as separate variables that may impact the model in different ways. Further, no consensus has emerged on how to measure trust and/or distrust, how trust and distrust interrelate, or where to place the constructs in the nomological network, across numerous disciplines, such as psychology, organizational behavior, marketing, management, operations, and IS. Within the IS domain specifically, as many as 20% of the articles in top journals mention trust in some way (Stenmark, 2013); fewer consider distrust as a separate and distinct construct from

trust, perhaps reducing the validity and predictive capabilities of the models. Some IS researchers have proposed that trust and/or distrust should be modeled as an antecedent (Tan, Benbasat, and Cenfetelli, 2013), while others believe trust and/or distrust may be a moderator (Shi and Chow, 2015), a mediator, (Weisberg, Te'eni, and Arman, 2011), or an outcome (Cho, 2006). Further, there is no generally accepted set of items to measure trust and distrust; rather, researchers develop their own scales depending on the context, such as individual trust (Bhattacharjee, 2002), business or organizational trust (Adams, 2004), and trust in online banking (Benamati and Serva, 2007). IS researchers, in particular, have completed little empirical research to examine how trust and distrust are related to consumer decision making, especially in the online environment and when using different IT artifacts, two areas of particular interest for IS researchers and practitioners. This lack of agreement on the specificities of the trust-distrust relationship within the IS context, and the impact on other constructs, upstream and downstream, presents a problem when attempting to build predictive models and refine them over time. Thus, this research takes an important step toward overcoming these gaps in the literature, using Lewicki and colleagues' important research as the foundation.

Since its publication in 1998, ProQuest indicates over 900 peer-reviewed articles have cited Lewicki et al.'s groundbreaking work on trust and distrust; Google Scholar, which includes additional scholarly sources such as books, theses, and other articles, shows almost three thousand citations of the same study. Both of these high citation counts argue for the relevance, acceptance, and importance of the original work. This oft-cited fundamental work paved the way for a greater understanding of trust, distrust, and the integration between the two. Yet, while most research seems to accept the proposed

theoretical framework as a foregone conclusion, few have empirically tested the conceptual model. It is interesting to notice Lewicki et al. (1998) deliberately refer to their work as “a new theoretical framework” in the abstract, stating: “*Although we postulate here that trust and distrust are separate dimensions, the question of the relationship between the two dimensions remains open, both theoretically and empirically*” (Lewicki et al., 1998, p. 445). Yet, the fact that the article is merely theoretical seemingly goes unnoticed by many researchers. While some authors specifically – and correctly – state the work by Lewicki et al. (1998) is theoretical (Dimoka, 2010; Liu and Goodhue, 2012), at least one researcher (Cenfetelli, 2004, p. 477) erroneously claims the article is empirical, furthering the propagation of misinformation. After twenty years, an empirical test of this popular assumption is due.

Clearly, the proposed theoretical framework of trust and distrust presents an opportunity to empirically test the model, but only a few researchers have yet to do so, and none of the previous researchers have analyzed the quadrants proposed. While Lewicki et al. (1998) called for empirical testing, and while researchers have embraced the proposed trust-distrust model, the important step of creating and validating reusable items to measure the constructs, has been largely ignored, resulting in fragmented and noncumulative trust and distrust measures. Thus, the first portion of this study undertook a process to create and validate items to measure trust and distrust, followed by an empirical test of the full survey instrument.

This study will use the trust and distrust concepts detailed in Figure 1, along with numerous other sources, as a basis for developing valid and reliable items to measure trust and distrust, followed by a field test, and statistical analysis. Only one IS researcher

has used the model similarly. Dimoka (2010) used functional magnetic imaging (fMRI) to detect trust and distrust in study participants, finding that trust and distrust triggered different areas of the brain, and that a high measure of trust or distrust was not equal to low measure of the other, thus providing support for Lewicki et al.'s (1998) theoretical proposals. However, that study has two potential limitations. First, while fMRI patterns indicated that trust and distrust were distinct variables, traditional surveys did not show them as different, confounding the issue of whether trust and distrust are separate, as shown in the fMRI results, or inseparable, as shown in the survey results. Further, Dimoka (2010) used simulated seller profiles to examine measures of trust and distrust and impact on resultant actions, rather than asking the respondents to think of something they had already completed, such as their last online transaction, when responding to the trust-distrust items. Thus, while this single IS article tested trust and distrust with fMRI and determined that they are different constructs, traditional survey items yielded conflicting results, indicating a need for refinement and reexamination of the items. This study attempts to bridge this identified gap.

Wrestling with trust and distrust is not specific to IS research. For instance, Adler (2005) used the keywords of Figure 1, as published by Lewicki et al. (1998), to develop a list of characteristics expected with simultaneous trust and distrust. This was a step in the right direction, yet no empirical test was conducted, and no dependent variable was proposed. In another article, Mascarenhas et al. (2006) used the theoretical framework of Lewicki et al. (1998) to develop highly specialized instrument items to measure trust for their unique context of a patient-physician relationship, as shown by a few sample items listed in Table 2. While this research may have been beneficial to the

Table 2 Sample items from Mascarenhas et al., 2006

The current complex healthcare system makes me doubt the competence of my doctors, nurses and other caregivers.
I am losing faith in our health delivery system that is controlled by health insurance companies.
The hospital administration is very careful in its choice of nurses and other support staff.
I feel the hospital can do only so much for me owing to my health insurance carriers.
Given the complexity of modern healthcare, I cannot but trust doctors and nurses.
I am afraid to trust my doctors, nurses and hospitals when I encounter a serious disease.

specific context of a patient-physician relationship, the item wording lowers the ability to extend these items to other contexts. In summary, only two previous articles attempted to empirically measure the theoretical model of trust and distrust as proposed by Lewicki et al. (1998), although the authors specifically called on scholars to do just that. Further, one of the articles reported mixed results when comparing brain scans and traditional survey instruments on trust and distrust, indicating a need to review and refine the survey items presented. Clearly, much work remains to be done.

This study began with instrument creation and validation for survey items based on the indicators proposed by Lewicki et al. (1998), along with a thorough search of other articles related to trust and distrust. Validation followed an accepted process for face validity and content validity (Straub, 1989), using a Q-sorting process to refine and validate items. IS academics, professionals, and students served as experts and participated in several rounds of sorting until consensus was reached. After the instrument was created, a field test was conducted. This study is the first to develop valid and reliable items for trust and distrust, as proposed by Lewicki et al.'s (1998) theoretical model, and empirically test results against the quadrants in the model. Thus, this study addressed the following overarching research questions:

Research Question 1: How should individual trust and distrust be measured?

After following a rigorous, in-depth process to develop items to measure trust and distrust, this study then empirically tested the survey in an e-commerce context, assessing if the quadrants proposed predicted consumer intentions to purchase, leading to the following secondary research question:

Research Question 2: How do combinations of individual trust and distrust predict downstream variables in the nomological network?

While the e-commerce context is of interest to researchers in diverse fields such as IS, management, and marketing, this study hopes to encourage further item development, refinement, and testing, with potential expansion to other contexts of interest.

CHAPTER 2 LITERATURE REVIEW

This literature review begins with an exploration of how the IS field has studied the relevant constructs in this study, trust and distrust. Next, a review of previous conceptualizations of trust and distrust, as the same or different variables, is presented, leading to the development of clear operational definitions for each. Then the quadrants theorized by Lewicki et al. (1998) are considered, with meaningful naming conventions proposed. This literature review brings together previous studies to answer the research questions, thus advancing the understanding of trust and distrust and how high/low level combinations may form meaningful quadrants. Finally, a review of previous research on trust/distrust in the IS context of e-commerce behavior is presented, followed by a discussion of the dependent variable in this study, willingness to transact, and ultimately leading to a conceptual model that describes the nomological network associated with trust and distrust.

Trust and Distrust in IS Research

To analyze how the work of Lewicki et al. (1998) impacted IS research and how trust and distrust are relevant to the IS field, a review was conducted of top IS journals for citations to Lewicki and colleagues, from 1998 forward. The journals chosen for this review are those publications listed as the Association for Information Systems (AIS) Senior Scholars' Basket of Journals. This basket of journals is shown in the first column of Table 3, as referenced from <http://aisnet.org/?SeniorScholarBasket> on January 3, 2017.

Table 3 Lewicki et al. (1998) cites in AIS Senior Scholars' Basket of Journals

Journals	Number of AIS Senior Scholars' Basket of Journal articles citing Lewicki et al. (1998)
European Journal of Information Systems	1
Information Systems Journal	2
Information Systems Research	5
Journal of AIS	4
Journal of Information Technology	0
Journal of MIS	5
Journal of Strategic Information Systems	3
MIS Quarterly	5
Totals	25

Searches for citations to Lewicki et al. (1998) discovered a total of 25 articles in these eight journals. The count found for each journal is reported in the second column of Table 3. These 25 articles, from eight IS journals, represent a combination of over 10,000 citations according to a Harzing's Publish or Perish Google Scholar query (Version 6.24, Harzing, 2018). While quantity evaluates the impact of an article, the quality of these journals indicates what the top researchers in a field have previously studied; thus, this analysis makes it clear that IS researchers are interested in trust and/or distrust and how to measure the variables in relevant contexts. Of these articles, the most common reason to cite Lewicki et al. (1998), found in 15 articles, is to support the theoretical assertion that trust and distrust are separate constructs. Two reasons, found in ten of the articles, tie for the second most common reason, to support the theoretical assertion that trust and distrust can exist simultaneously and to reference back to the definitions of trust and/or distrust supplied by Lewicki et al. (1998). Three reasons tie at two articles each, namely, to support the idea that trust changes over time, to support the idea that trust and distrust

have different antecedents, and to reference back to the concept that trust and distrust can exist in a state of imbalance. Three other articles cite Lewicki et al. (1998) for unique reasons such as distrust mitigation, trust repair, and to claim that the distinction between trust and distrust is still unresolved. Table 4 lists the author of each article that cites Lewicki et al. (1998), the journal in which the article is published, and the reason for the citation. Trust and distrust are relevant constructs in IS research and offer opportunities to better understand underlying motivations of individuals. The trust and distrust perceptions of current, potential, and future individuals (or customers) may influence decisions made by IS managers and may further build upon relevant IS research. For instance, understanding trust and distrust perceptions as separate constructs may expand upon the findings of Dimoka (2010), allowing healthcare providers – and insurance companies - to find ways to gain patient trust and limit patient distrust. There are numerous other relevant issues in IS research and practice, including the effect of changing trust and distrust perceptions: between individuals selling to other individuals online; between individuals and other individual customers whose recommendations are used prior to making a purchase; between individuals who submit DNA information for ancestry analysis and the respective organizations used; between individuals and organizations who frequently cancel orders due to stock-outs; and numerous other contexts, spanning information systems, management, and marketing research and applications. Specifically, within the IS context, when interactions take place partially or completely online, trust-distrust perceptions may affect downstream variables in different ways and may be affected by IT artifacts used. Prior to making any predictions about

individuals and/or customers, however, the next sections describe the trust and distrust constructs, leading to operational definitions used in this study.

Trust

Following the theoretical foundation of Lewicki et al. (1998), this study defines trust as “confident positive expectations regarding another's conduct” (p. 439); Gefen (2002) described how it is beneficial to consider the components of trust as a multidimensional construct, and this research extends understanding of the multiple elements comprising trust. In the context of this research, individual trust is thus operationalized as a confidence in positive outcomes when control is ceded to another party. Numerous authors, across diverse fields, have studied the variable of trust. As a second-order construct, trust is composed of benevolence, competence, and integrity (Moody et al., 2014). Competence is defined as the belief in the ability of another to do as they claim they will do (Gefen, 2002) and measures confidence in another's skills and performance capability (Gefen, 2002; McKnight and Chervany, 1996; McKnight, Choudhury, and Kacmar, 2002a). Benevolence is defined as the belief in the good intentions and kindness of another toward the individual (Gefen, 2002) and is the extent to which the individual believes that another (person or organization, depending on the context) cares about the individual's concerns and wants to act in good faith at all times toward the individual (Gefen, 2002; McKnight and Chervany, 1996; McKnight et al., 2002a). Integrity is defined as the belief in the honesty and truthfulness of another (Gefen, 2002; McKnight and Chervany, 1996; McKnight et al., 2002a). However, the measurement of trust is complicated. Historically, a clear operational definition of trust has been elusive. The following from McKnight et al. (2002a) accurately summarizes the

Table 4 Trust and distrust reasons why Lewicki et al. (1998) was cited

Trust and distrust reasons why Lewicki et al. (1998) cited. (Sorted by publication date.)								
Article	Publication	Distinct constructs	Coexist	Definitions	Change over time	Different antecedents	State of imbalance	Other
Bhattacharjee (2002)	Journal of MIS	•						
McKnight et al. (2002a)	Information Systems Research	•						
McKnight et al. (2002b)	Journal of Strategic Information Systems	•						
Hsiao (2003)	Journal of Strategic Information Systems			•				
Allport and Kerler (2003)	Information Systems Research	•						
Kim et al. (2004)	Journal of AIS				•			
Cenfetelli (2004)	Journal of AIS	•	•					
Kirsch and Haney (2006)	Journal of Strategic Information Systems							trust integral to negotiation
Charki and Josserand (2008)	Journal of MIS			•				
Wang and Benbasat (2008)	Journal of MIS	•	•				•	
Son and Kim (2008)	MIS Quarterly			•				
Staples and Webster (2008)	Information Systems Journal			•				
Komiak and Benbasat (2008)	Journal of AIS	•	•	•		•	•	
Benbasat et al. (2010)	MIS Quarterly							distinction unresolved
Dimoka (2010)	MIS Quarterly	•	•	•		•		
Riedl et al. (2010)	MIS Quarterly	•						
Wright and Marett (2010)	Journal of MIS			•				
Cenfetelli and Schwarz (2010)	Information Systems Research	•	•					
Majchrzak and Jarvenpaa (2010)	Journal of MIS							distrust mitigation
Jarvenpaa and Majchrzak (2010)	Information Systems Research	•	•	•	•			
Liu and Goodhue (2012)	Information Systems Research	•	•					
Lowry et al. (2015)	Information Systems Journal							trust repair
Moody et al. (2015)	European Journal of Information Systems	•	•	•				
Lankton et al. (2015)	Journal of AIS	•	•					
McGrath (2016)	MIS Quarterly	•	•	•				

struggle to understand the complexities of trust rather exquisitely:

Trust has traditionally been difficult to define and measure (Rousseau et al. 1998). Researchers have called the state of trust definitions a “confusing potpourri” (Shapiro 1987, p. 625), a “conceptual confusion” (Lewis and Weigert 1985, p. 975), and even a “conceptual morass” (Barber 1983, p. 1; Carnevale and Wechsler 1992, p. 473). ... Keen et al. (1999) noted that, “. . . the basic conclusion in all these fields [is] trust is becoming more and more important, but we still can’t really say what it exactly is” (pp. 4–5). (p. 335)

While researchers have posited trust as a multifaceted construct (Gefen, 2002; Pavlou and Dimoka, 2006), distrust has only recently been described in terms of its individual components, as discussed next.

Distrust

Lewicki et al. (1998) define distrust as “confident negative expectations regarding another's conduct” (p. 430). This conceptual definition of distrust has been adopted in IS research by many scholars (Charki and Jossierand, 2008; Hsiao, 2003; Jarvenpaa and Majchrzak, 2010; Komiak and Benbasat, 2008; McGrath, 2016; Moody, Lowry, and Galletta, 2015), although there are no agreed upon operational definitions. In the context of this research, individual distrust is thus operationalized as a confidence in negative outcomes when control is ceded to another party by measuring three major components of distrust. As a second-order construct, distrust is composed of incompetence, malevolence, and deceit (Moody et al., 2014). As trust and distrust are considered separate constructs instead of opposite ends of a single continuum, incompetence is considered separate from competence, malevolence is considered separate from

benevolence, and deceit is considered separate from integrity. Incompetence is defined as the belief that another is inept to do as they claim they will do; it measures a concern for the lack of knowledge, resources, responsibility, or expertise to accomplish what has been promised (Moody et al., 2014). Malevolence is defined as the belief in the bad intentions and ill will of another toward you (Moody et al., 2015) and assesses the level of doubt that others will go out of their way for a customer's interests (Moody et al., 2014). Deceit is defined as the belief in the dishonesty and duplicity of another (Moody et al., 2015), and is a measure of wariness that another would lie, cheat, or steal to win or gain an upper hand (Moody et al., 2014).

Trust and distrust research would be well-served with the establishment of standard instruments to measure each construct. With consistent and standardized items, researchers will have the opportunity to test, refine, and further develop a better understanding of trust-distrust relationships between individuals and other individuals, individual and brick-and-mortar companies, individuals and online vendors, patients and doctors, and numerous other contexts. As this study moved forward toward item development, a trust-distrust nomological network was conceptualized, as described in the next section.

Trust-Distrust Relationship

In a review of trust and distrust literature, two distinct theories arise in previously published research arguing whether trust and distrust form a single construct (Rotter, 1971) or separate constructs (Lewicki et al., 1998). A third position contends the distinction between trust and distrust is still an unresolved issue (Benbasat, Gefen, and Pavlou, 2010). Thus, in order to develop valid and reliable measures, researchers first

must determine if trust and distrust are opposite ends of a single continuum, a view espoused by Rotter (1971), who proposed only temporary conflicts between trust and distrust, and an eventual convergence into a single measure of trust. Other research distinguishes trust from distrust by treating them as separate constructs (Cho, 2006; Lewicki et al., 1998; McKnight and Choudhury, 2006). Figure 2 shows this conceptualization of separate trust and distrust. The theory behind the two-construct representation submits that trust can be measured from zero trust to a full measure of trust while distrust can simultaneously and independently be measured from zero distrust to a full measure of distrust.

While most of the debate over how to measure trust and distrust has come from management and marketing, IS researchers have also provided valuable contributions to the discussion. For instance, through use of functional MRI (fMRI), IS research supports the theory of trust and distrust as separate constructs, showing dissimilar activated regions of the brain, and demonstrating that high trust may not be the same as low distrust, and low trust is not the same as high distrust (Dimoka, 2010). Dimoka's research defines trust and distrust as separate yet related constructs and proposes a study to test how combinations of these relationships may predict willingness to transact in an e-commerce environment.

Benbasat, Gefen, and Pavlou (2010) summarize the research stream regarding trust and distrust in IS literature by calling for additional research with an extension to under-researched IS contexts. They describe how researchers struggle to determine whether trust and distrust are separate constructs or opposite ends of a single continuum, much like the trust-distrust discussion taking place in management and marketing

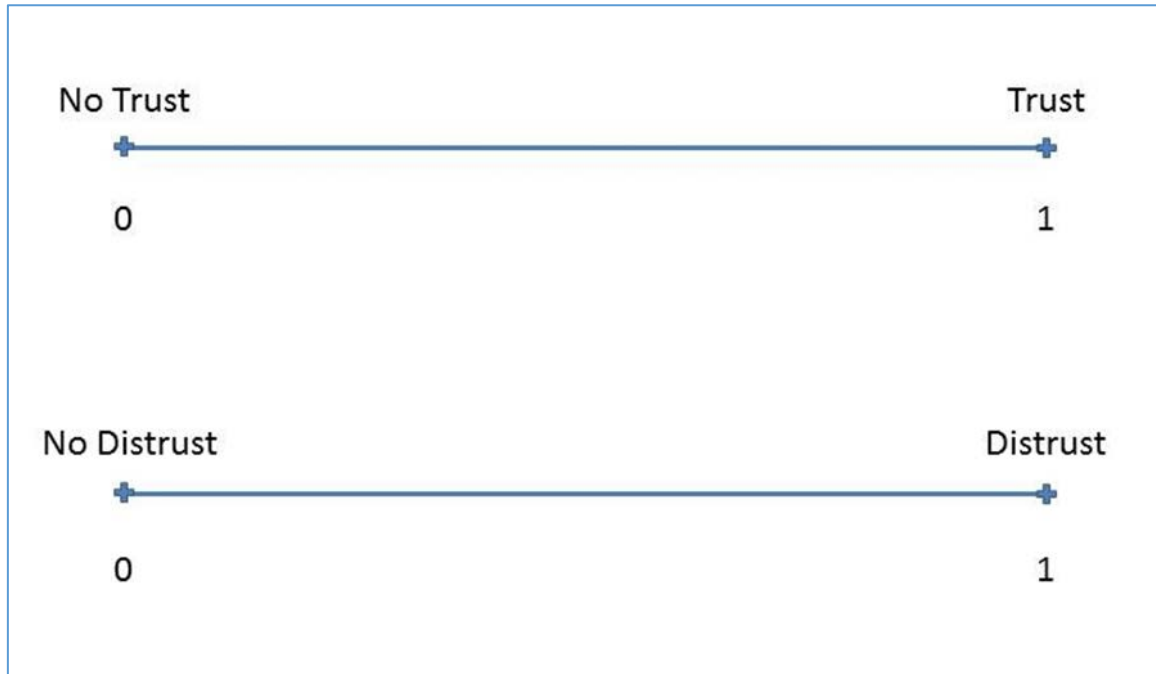


Figure 2 Trust and distrust as separate constructs

research. They point to the same fMRI study (Dimoka, 2010) which shows that trust and distrust illuminate different areas of the brain, as additional contributions to the field and an indication that trust and distrust are likely two separate and distinct variables.

However, this fMRI study, on its own, does not prove that trust and distrust exist separately, particularly since survey results failed to match fMRI indications.

If trust and distrust are measured as a single construct, they could cancel each other out and render the construct measurements useless. Marsh (1994) concurs with other researchers and recommends that the variables of trust and distrust should be measured separately, although the field as a whole has yet to reach a consensus. This lack of agreement over how to measure trust and distrust forms one of the main goals of this research: to measure and empirically test reliable and valid items for individual perceptions of trust and distrust. In effect, this research proposes that trust and distrust

measure different attitudes of a single situation and should be measured separately to accurately predict individual behavior when interacting with an organization. However, depending upon the wording of an item, the lack of trust may only be measured as indifference, not, as some have interpreted, as distrust. McKnight and Choudhury (2006) verify beliefs and intentions of trust and distrust can be distinct variables operating as mediators between structural assurance and various intentions in an e-commerce model. Thus, when conceptualizing trust and distrust, this study chose to measure trust and distrust as separate and distinct constructs and developed items accordingly. Next, the type of trust-distrust was selected.

Types of Trust-Distrust

IS research on trust-distrust has studied the constructs using various terms, such as consumer trust (McKnight, Choudhury, and Kacmar, 2002b), e-commerce trust (McKnight et al., 2002a), general trust (Jarvenpaa and Majchrzak, 2010), and specific specialty forms of trust (Charki and Josserand, 2008), as shown in Table 5. While Lewicki et al. (1998) focused on interpersonal trust, the relationships between coworkers, as the thought-experiment context of their theoretical proposal, this research remains centered on individual trust. Clearly defined operational definitions of individual trust and distrust, along with development of a survey instrument based on theoretical rationale, may allow future researchers to refine the items to numerous relevant contexts. Additional research needs to be conducted to determine more specifically how trust and distrust are related, how they are distinct, and what this means to organizations; this research is a step in that direction. After deciding to measure trust and distrust as separate

and distinct constructs and selecting the type of trust to measure, a clear, operational definition had to be developed.

Operational Definitions

Perhaps the differences between study results may be attributed to how trust and distrust have been defined. For instance, Marsh (1994) clearly defined trust as a measure ranging from indifference to total trust, with distrust as a measure ranging from indifference to total distrust. The result: trust, lack of trust, and distrust are three separate states of trusting behavior, yet they all exist along a single continuum. In addition, depending upon the wording of an item, the lack of trust may only be measured as indifference, not, as some have interpreted, as distrust. McKnight and Choudhury (2006) verify beliefs and intentions of trust and distrust can be distinct variables operating as mediators between structural assurance and various intentions in an e-commerce model. Researchers should have developed clear operationalizations of trust and distrust, limiting the scope, and avoiding overlap with beliefs, intentions, and behaviors. This research did these, then used a rigorous, theoretically-based process to develop items, as described next.

Item Development

If trust and distrust are treated as distinct constructs yet measured with cross-referencing items, the measures could still cancel each other out and render the construct measurements useless. Previous items to measure trust and/or distrust illustrate some of these problems. For instance, when looking at the subconstructs of distrust, if incompetence is measured with an item stating, "... not really competent..." (Moody

Table 5 Previous IS research on trust

Type of Trust	Previous IS Research	Findings
Consumer trust	McKnight, Choudhury, and Kacmar (2002b)	building initial trust with consumers is essential to e-commerce
E-commerce trust	McKnight et al. (2002a)	the nature of trust is complex and multidimensional
General trust	Dimoka (2010)	functional neuroimaging of the brain identifies separate neural correlates for trust (reward prediction) and distrust (intense negative emotions)
	Hsiao (2003)	trust production must consider each of the relevant sub-dimensions of trust and distrust
	Jarvenpaa and Majchrzak (2010)	trust and distrust are simultaneous, change over time, can be asymmetric between parties, and appraisals of another's trust and distrust can be inaccurate
	Komiak and Benbasat (2008)	trust and distrust co-exist simultaneously and separately
	Wang and Benbasat (2008)	trust and distrust are simultaneous, but not totally asymmetric
Interorganizational trust	Charki and Josserand (2008)	damage to trust can lead to reciprocal actions that cause distrust
Interpersonal trust	Staples and Webster (2008)	task structure affects trust building in teams
Online trust	Bhattacharjee (2002)	trust significantly predicts willingness to transact
Interpersonal trust	Riedl, Hubert, and Kenning (2010)	functional neuroimaging of the brain finds considerable number of neural differences of trust and distrust activation regions based on gender
Organizational trust	Lowry, Posey, Bennett, and Roberts (2015)	trust is a mediator between reactive computer abuse and its predictors
Trust in technology	Lankton, McKnight, and Tripp (2015)	human-like trust and system-like trust are similar, but not the same

2015 p. 41); does this measure the upper end of the incompetence scale or the lower end of the competence scale? When deceit is measured with "...won't always hold to the standard of honesty..." (Moody 2015 p. 41), does this measure the upper end of the deceit scale or the lower end of the honesty scale? Similarly, when trust is measured with phrasing such as "...not engage in any kinds of exploitive and damaging behavior..." (Cho, 2006, p. 34), does this measure the lower end of the trust scale or the upper end of the distrust scale? Moreover, the last item exhibits multidimensionality issues. If the individuals believes another engages in exploitive but not damaging behavior (or vice versa), how should they respond? Clear, well-developed survey items to measure the subconstructs of trust and distrust, should be developed to overcome the limitations of previous instruments developed. Throughout the trust (and distrust) literature, problems with the development of items that are reliable and reusable, and which measure trust and distrust separately, continue. To overcome these gaps, unidimensional items are needed to accurately capture the upper and lower ends of the separate continuums. However, rather than simply making predictions based on the impact of trust and/or distrust on a dependent variable of interest, Lewicki et al. (1998) developed quadrants to represent high/low measures of trust/distrust, adding additional conceptual value – and complexity – to the discussion, as described in the next sections.

Quadrants: High/Low Levels of Trust/Distrust

The quadrants proposed by Lewicki and colleagues' (1998) are a representation of the various states of simultaneous trust and distrust. Individuals who hold the defined levels of trust and distrust are said to be in the states represented by quadrants.

Theoretically, those in each quadrant should exhibit sentiments as described by the statements defining each quadrant, as previously shown in Figure 2.

Since this paper proposes that trust and distrust are separate and distinct constructs, an examination of the where individuals fall in the four quadrants (e.g., what specific combinations of high/low trust/distrust they exhibit) may provide interesting outcomes that are relevant to researchers and practitioners. When arranged in a 2 by 2 matrix, there are four quadrants, each comprised of different combinations of high/low trust and distrust, as shown in Table 6. Quadrant 1, indifference, is defined where there is low trust and low distrust. Individuals in this quadrant do not distrust the other (another individual, organization, government agency, etc.), but they do not trust them either. Quadrant 2, reliance, is defined where there is high trust with low distrust. Individuals in this quadrant represent the ideal state from the perspective of the other; they trust and simultaneously have no feelings of distrust toward the other. Quadrant 3, wariness, is defined where there is low trust with high distrust. This state represents the least desirable quadrant from the perspective of the other; individuals do not trust the other, and in fact, clearly distrust them. Unless forced to do so for various reasons, an individual in this quadrant is not likely to complete transactions with another; this is the least desirable quadrant from the other's point of view. Quadrant 4, confliction, is defined where there is high trust and high distrust. Here, the individual trusts the other, but for whatever reason also distrusts them. Understanding where individuals fall in these quadrants, based on their levels of high/low trust/distrust, provides the other with valuable information when trying to complete transactions. From an organizational perspective, understanding where customers fall in these quadrants may provide opportunities to change customer states,

Table 6 Conceptual and operational definitions by quadrant

	Low Distrust	High Distrust
High Trust	<u>Conceptual</u> Quadrant 2, Reliance	<u>Conceptual</u> Quadrant 4, Confliction
	<u>Operational</u> Simultaneous levels of high trust + low distrust	<u>Operational</u> Simultaneous levels of high trust + high distrust
Low Trust	<u>Conceptual</u> Quadrant 1, Indifference	<u>Conceptual</u> Quadrant 3, Wariness
	<u>Operational</u> Simultaneous levels of low trust + low distrust	<u>Operational</u> Simultaneous levels of low trust + high distrust

instill trust, lower distrust, and sell more products or services or predict other outcomes.

The next sections describe each of the quadrants, from the individual customer states of trust with respect to an organization, although there are numerous relationships which may be relevant to understanding the quadrants, such as individual-individual, citizen-government, organization-organization, and organization-government. Those additional interactions are beyond the scope of this paper.

Quadrant 1, Indifference (Low Trust, Low Distrust)

Quadrant 1, indifference, represents simultaneous low trust and low distrust.

When trust and distrust are both zero, indifference results (Marsh, 1994). An individual with indifference typically has not yet formed an opinion (Marsh, 1994; Saunders, Dietz, and Thornhill, 2014). Quadrant 1 is characterized by casual relationships, limited interdependence between customer and provider, and bounded, arms-length transactions, or those that may exist only as a professional courtesy (Lewicki et al., 1998). Reasons for simultaneous low trust and low distrust include a limited history of interaction, a lack of emotional attachment, and a superficial relationship (Adler, 2005). When customers are

indifferent, they tend to exhibit detachment from an organization and feel a lack of a relationship. They may decide to find other options for purchasing a product or service, or they may not. They exhibit little loyalty to a company.

Quadrant 2, Reliance (High Trust, Low Distrust)

Alternatively, if an individual exhibits simultaneous high trust and low distrust they are in Quadrant 2 (Marsh, 1994; Saunders et al., 2014) , defined in this research as reliance. Individuals in this quadrant have greater confidence about the relationship with the organization, tend to be open to vulnerability, and expect a favorable outcome. If companies had the opportunity, chances are they would likely choose for all of their customers to be in this quadrant. Those in Quadrant 2 are open to interactions and transactions with those organizations that they trust. This quadrant is characterized by high-value congruence, promotion of interdependence, pursuit of joint opportunities, and openness to new initiatives (Lewicki et al., 1998). Customers may exhibit high trust and low distrust because of alignment of values, mutual reliance on the actions the other may take, shared work and values, and open communication (Adler, 2005). Further, customers who exhibit high levels of trust and low levels of distrust are likely to form long-term relationships with business partners and participate in current and future transactions, given no change in state; thus, they are more willing to transact with organizations that they trust, as long as they – simultaneously – do not distrust the company. This quadrant is sometimes referred to as blind trust (Benamati et al., 2006); however, the terminology seems to negate consideration of simultaneous distrust (Marsh, 1994).

Quadrant 3, Wariness (Low Trust, High Distrust)

Quadrant 3, wariness, represents simultaneous low trust and high distrust. An individual with high distrust has greater confidence that any vulnerability will be exploited to produce an unfavorable outcome (Lewicki et al., 1998; Saunders et al., 2014). When combined with low trust, high distrust exhibits the predominant control over a customer's perceptions. This is the least desirable quadrant from an organization's perspective. Customers with wariness expect little privacy protection or data integrity from organizations. In fact, customers may believe that the organization will use their information in an unethical manner – and do so intentionally (Kramer, 1999). Moreover, customers are paranoid about the motives of the business, perhaps with justification. Customers in the wariness quadrant are unlikely to be willing to complete transaction with a business (Marsh and Dibben, 2005). Reasons for the wariness may include previous experience with dishonest actions of the business, a bad relationship with the organization, inaccessibility of information, high penalties, and negative news. Clearly, businesses would prefer to have no, or very few, customers in this state.

Quadrant 4, Conflicted (High Trust, High Distrust)

Finally, customers may exhibit high levels of trust combined with high levels of distrust, placing them in Quadrant 4, confliction. In this quadrant, relationships can be multifaceted or multidimensional (Lewicki et al., 1998). Trust may be warranted in certain situations, while distrust is appropriate in other situations within the same relationship. Customers in the confliction quadrant will trust while verifying those they both trust and distrust. They will continually monitor for potential risks and place tight boundaries on interactions. When people experience high trust with high distrust, they

may optimistically feel hopeful yet still feel cautious (Adler, 2005; Lewicki et al., 1998). This state of high trust and high distrust is probably the least studied and the least understood of all of the quadrants. By definition, this quadrant stands in direct contrast to the theory of a single continuum. An individual with confliction is torn between high levels of trust and high levels of distrust, which could lead to various outcomes such as cautiously trusting, regretfully distrusting, or conducting additional research to resolve the conflict (Benamati et al., 2006; Lewicki et al., 1998). As more research is conducted and more knowledge learned, trust may reach a level of maturity that endures in the face of distrust (Benamati et al., 2006). While conflicted customers will trust but verify, they still may proceed with business transactions because their distrust has motivated them to look deeper which in turn increases their level of trust (Kramer, 2002). However, the results are not yet settled on how states of high trust combined with high distrust affect an individual's willingness to interact with an organization.

Quadrant Dynamics

Placement into a particular quadrant based on high/low measurements of trust and high/low measurements is a single instance or state. Individual levels of trust and distrust may change and, as some research has suggested, be changed purposefully (Lowry, Posey, Bennett, and Roberts, 2015; Majchrzak and Jarvenpaa, 2010). As trust and distrust between parties changes over time, the resultant quadrant placement must also change over time (Jarvenpaa and Majchrzak, 2010; Kim, Xu, and Koh, 2004). This movement among quadrants over time is beyond the scope of this paper, but it is an important consideration for organizations who want their customers to continue to reliably and predictably buy products or services from them.

Trust-Distrust Nomological Network

Development of theoretically justified items to measure trust and distrust provides a valuable contribution to the literature and defining and assessing the impact of quadrants extends the contribution. However, a full understanding of trust and distrust should include the context of interest and how these constructs are related to and influence future actions, as described in the next sections.

Context

This research seeks to understand trust and distrust within a relevant IS context: the willingness of an individual to trust and/or distrust the organization involved in an e-commerce transaction. Similar environments have been studied by other IS researchers (Bhattacharjee, 2002; Dimoka, 2010; McKnight, Choudhury, and Kacmar, 2002b), although mixed results have been reached. The use of inconsistent operational definitions of trust and distrust, as evidenced by the collection of trust and distrust items from the various sources listed in APPENDIX C, could explain the mixed results. The importance of trust and distrust as vital components in customer relationships warrants further inspection. This is particularly true in an e-commerce environment where face-to-face interactions are replaced by technology (Dwyer, Hiltz, and Passerini, 2007; Wang and Benbasat, 2008). In an e-commerce transaction, customers start from a stance of distrust due to the amount of personal information that must be revealed to conduct a transaction. Therefore, e-commerce businesses must strive to build trust (Gefen, Karahanna, and Straub, 2003; Kim and Benbasat, 2009). As a customer's individual trust toward a business is increased, customer concerns are eased which leads to a higher probability of a completed transaction (Lee and Cranage, 2011).

The value of interaction between customers and organizations is partially determined by comparing the benefits of interaction with the detrimental costs of interaction. Research indicates both customers and businesses benefit from cooperation in a mutually trusting relationship (Bélanger and Crossler, 2011). On the other hand, when a company stands to benefit at the customer's loss, distrust builds (Gefen et al., 2003). For instance, when customers release personal information to an organization, they may not know how the business will use and safeguard their data (Nunan and Di Domenico, 2013). When uncertainty exists, trust becomes a determinant of how a customer will generally expect a business to handle personal information provided to them. In a typical business transaction, the customer may be required to release some personal information such as email address, phone number, or credit card number. Once an organization has this information, it can be used in other ways in which the customer did not agree. Each transaction can build trust or distrust. This is particularly true in the case of online vendors where so much of the customer's personal information is in the control of the seller (Gefen et al., 2003), and where the purchaser does not have a face for the business or a brick-and-mortar building to visit.

Any opportunistic behavior, whether legal or not, has the potential to erode customer trust. E-commerce businesses, for instance, must continually maintain and rebuild customer trust (Gefen et al., 2003). Any breach of trust will damage the business if customer privacy concerns escalate, thereby reducing the likelihood of a completed transaction (Schwaig, Segars, Grover, and Fiedler, 2013) between the individual and the organization. Mitigating factors, such as familiarity and past experience with an organization, build consumer trust while reducing the consumer concern over privacy

issues (Chellappa and Sin, 2005). Thus, in an effort to measure trust and distrust in a context that is relevant to IS researchers, the e-commerce environment was selected for this study. Numerous previous IS researchers have used a similar environment, and this research adds value through the development of consistent, theoretically-based measurements of trust and distrust as separate and distinct constructs.

Willingness to Transact

When deciding on a dependent variable, this study sought one that is relevant to practitioners and researchers should be selected, that has been studied in the past, and that may be relevant to the nomological network of trust and distrust; the dependent variable chosen for this study is willingness to transact.

A full understanding of trust and distrust should include how these constructs are related to and influence future actions. Even when narrowed down to a business information systems context, there are still many possible areas where trust and distrust could influence outcomes. To incorporate a final dimension of trust, distrust, and their effective measurement within a nomological network, this study selected willingness to transact as the dependent variable of interest.

The measure of customer intent to complete a transaction has been called by many names such as usage intention (Kim, Ferrin, and Rao, 2008), willingness to buy (Hinz, Hann, and Spann, 2011), purchase intention (Hong and Cha, 2013), repurchase intention (Fang et al., 2014), willingness to transact (Morgan and Hunt, 1994), and various other names. The dependent variable for this study, willingness to transact, is defined as the likelihood that an individual will undertake actions to complete a sale with a specific online organization, as described by numerous previous research articles

(Bhattacharjee, 2002; Gefen, 2000; Gregg and Walczak, 2008; Jarvenpaa, Tractinsky, and Vitale, 2000). A customer's willingness to transact with an organization may partially depend upon the trust in the organization (Gefen, 2000). Thus, companies have a vested interest in learning which variables influence willingness to transact and how to better manipulate these variables to increase the likelihood that customers will complete a sale.

The naming conventions for a customer's willingness to engage with and make purchases may indicate subtle differences in use or in the focus of individual research streams. The bottom line is that researchers and practitioners want to know what the customer intends to do and how to predict customer actions. If organizations understand trust-distrust perceptions, they may be able to change those perceptions and translate to higher conversion rates. Similar to usage conventions of Bhattacharjee (2002) and Gregg and Walczak (2008), the term willingness to transact was chosen specifically to represent both the intent to trust, *willingness*, and the intent to complete a transaction, *to transact*.

Some prior studies have shown that trust in an e-commerce context affects an individual's purchase intentions (Bhattacharjee, 2002). The relationship between individual purchase intentions and trust-distrust perceptions has shown mixed results, however, with some significant relationships and some insignificant relationships, even within the same study (Dimoka, 2010; Hong and Cha, 2013; McKnight and Choudhury, 2006), and with researchers measuring different dependent variables. Pavlou and Fygenon (2006) used actual purchase intention as the dependent variable of choice, while others used actual behavior (McKnight et al., 2002a) as a surrogate for willingness to transact. Past research has shown the importance of understanding the customer

intentions, with Chintagunta & Lee (2012) demonstrating that historical behavioral intentions predict future behavior; Smith et al. (2008) concurred, describing how past behavior is positively related to purchase intentions, with trust serving as a mediating variable. Other researchers (Weisberg et al., 2011) agreed that historical data predicts purchasing behavior in the online environment (Weisberg et al., 2011), with Huang, Jim Wu, Wang, and Boulanger (2011) finding similar results when evaluating purchasing intentions in the online auction context.

This paper theorizes that the independent variables of trust and distrust, comprised of theoretically justified subconstructs, will be related to the dependent variable of willingness to transact, directly and through interaction, as shown in the conceptual model in Figure 3. Further, this paper proposes that quadrant dynamics, as represented by high and low levels of trust and distrust, may play a role in the individual customer's willingness to transact with an organization in an e-commerce environment, in line with theorized relationship proposed by Lewicki et al. (1998).

Constructs Outside the Scope of the Study: Ambivalence and Suspicion

When developing operational definitions of constructs that have yet to be agreed upon within the field, it is important to describe not only what variables are included in the model, but which variables are omitted. While the constructs of ambivalence and suspicion have been suggested as part of the network of associations that describe trust and distrust integrations, researchers have not agreed on where – or even if – these variables should be included in the model. Because of the lack of consensus in prior research, this study intentionally excludes ambivalence and suspicion from the model. Ambivalence has received distinctly conflicting definitions among researchers, being

simultaneously described as situations of low or non-existent trust and distrust (Benamati and Serva, 2007) and situations of high trust and distrust (Jarvenpaa and Majchrzak, 2010; Moody et al., 2014).

Suspicion is operationalized in even more ambiguous manners, with some researchers using suspicion as a synonym of distrust (Benamati and Serva, 2007; Deutsch, 1958), an antecedent of distrust (Moody et al., 2014), and an alternative view that suspicion and distrust are not the same thing (McKnight and Chervany, 2001). This final view is based on dictionary definitions where “evidence” is mentioned in the definition for suspicion but not in the definition for distrust. Because of the lack of agreement on how to model suspicion and ambivalence, those constructs are deemed outside of the scope of this paper and are not included in the final conceptual model.

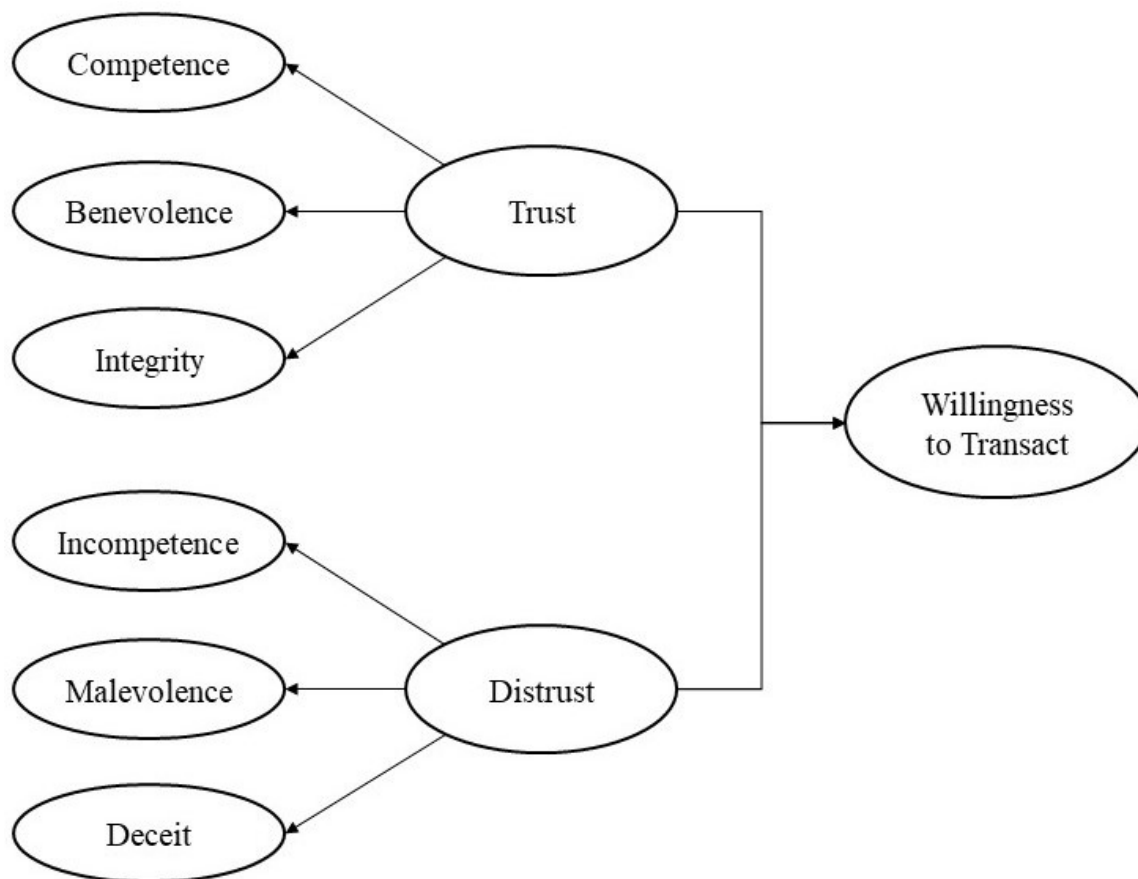


Figure 3 Conceptual Model

CHAPTER 3 METHODOLOGY

This is a quantitative positivist instrument development study. The goal of this study was to improve on the theoretical and operational understanding of trust and distrust. To that end, methodologically, we began with a focus on developing orthogonal measures of trust and distrust in a multi-step process. First, a list was created comprising existing trust and distrust items along with new items created based on theoretical rationale. The methodology followed the Q-sort procedure to validate a new survey instrument. To investigate the performance of the new measures within the nomological network of trust and distrust, using a well-established dependent variable, a field study was conducted using the final trust and distrust items from the Q-sort. From this data, we provide evidence of validity through an exploratory factor analysis conducted using SPSS and a confirmatory factor analysis conducted using Amos. Next, we provide evidence of reliability using Cronbach's alpha through model fit and path analysis with PLS-SEM as described by Hair, Hult, Ringle, and Sarstedt (2017). Finally, K-means clustering to provide groupings of high/low trust and distrust and PLS-MGA were used to assess the interaction effect of trust and distrust using the quadrants proposed by Lewicki et al., (1998). Similarly, the groupings based on the IT artifact were also examined through PLS-MGA. In sum, this paper used the methods described herein to develop a standardized, validated survey instrument that may be tested and refined by future researchers, which may be used to lead to cumulative and consistent results; thus,

businesses may be able to develop more meaningful and profitable levels of trust with their customers.

Q-Sort Procedure

Overall, the methodology of this study follows general recommended validation guidelines (Straub, Boudreau, and Gefen, 2004) using a sorting procedure, (Davis, 1985, 1989; Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991; Tan et al., 2013) also called a Q-sort technique (Bhattacharjee, 2002; Segars and Grover, 1998; Storey, Straub, Stewart, and Welke, 2000; Straub et al., 2004). Use of a Q-sort procedure is appropriate because Q-sorting can provide construct validity (Petter, Straub, and Rai, 2007; Straub et al., 2004), convergent validity (Straub et al., 2004), discriminant validity (Moore and Benbasat, 1991; Segars and Grover, 1998; Storey et al., 2000; Straub et al., 2004; Thomas and Watson, 2002), and is especially recommended when the goal is scale development (Segars and Grover, 1998), as is the goal in this study. Table 7 shows how previous IS researchers have used Q-sorting procedures to describe fundamentally similar processes.

Exactly what constitutes a Q-sort versus a sorting procedure remains open to discussion. One noted point raised is whether a Q-sort requires a specific distribution (Thomas and Watson, 2002). Brown (1980) has been cited to support the claim that a valid Q-sort procedure requires a forced distribution (Thomas and Watson, 2002). Alternatively, Brown (1993) has been cited to support the claim that a Q-sort distribution shape is irrelevant to Q-sort analysis (Dziopa and Ahern, 2011). Brown (1993) writes, “Both the range and the distribution shape are arbitrary and have no effect on the subsequent statistical analysis and can therefore be altered for the convenience of the Q

Table 7 Q-sorting and Sorting Procedures in IS Research

Q-sort and Sorting Procedures in IS Research						
Article	Term	Categories	Begin Items	End Items	Rounds	Raters
Davis, 1989	categorization	2	13	-- ²	1	15
Moore and Benbasat, 1991	sorting procedure	7	94	38	4	4-5 ³
Segars and Grover, 1998	Q-sort	4	28	23	1	25
Storey, Straub, Stewart, and Welke, 2000	Q-sort	10	61	51	1 of 2	40 ³
		-- ²	-- ²	-- ²	2 of 2	55
Thomas and Watson, 2002	Q-sort	3	14	14	1	9
Bhattacharjee, 2002	Q-sort	9	26	9	1	6
Tan, Benbasat, and Cenfetelli, 2013	sorting procedure	16, 6 ⁴	49, 18	²	1 of 3	5 ³
		-- ²	-- ²	-- ²	2 of 3	6
		-- ²	-- ²	-- ²	3 of 3	3
Hoehle and Venkatesh, 2015	sorting procedure	6	120	82	1 of 1	6
		6	82	78	1 of 1	318

sorter” (p. 102). Thus, the sample distribution shape is irrelevant and will not be addressed in this study. Other IS researchers have followed similar rationale using the Q-sort procedure (Bhattacharjee, 2002; Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991; Segars and Grover, 1998; Storey et al., 2000; Tan et al., 2013). In this study, the sorting procedure is referred to as a Q-sort, with the terms Q-sort and sorting procedure used interchangeably.

² Data not provided.

³ Different raters were used for each round.

⁴ Tan et al., 2013, divided the constructs and the items into two higher-order construct groupings for the first two rounds. In round one, raters sorted 49 items into 16 groups then sorted 18 items into six groups. In round two, raters again sorted the two higher order groups separately and sequentially. In round three, three raters sorted the combined set of items into groups.

Number of Rounds

In line with previous IS researchers who used Q-sorting, this study followed similar guidelines for scale development and refinement, as shown in Table 7. This study utilized four sorting rounds to create a valid and reliable set of items to measure trust and distrust. With four rounds, this study is at the upper end of previous IS research using Q-sort, which used one to four rounds, as shown in Table 7. After determining the types of participants for each sorting round, the number of participants in each round was considered, as well as the characteristics of the raters.

Number of Raters

In each round, a minimum of five raters participated in the Q-sort process, well in line with the median of six raters per round of the studies listed in Table 7. Prior use of Q-sorting in IS research used as few as three raters in a single round (Tan et al., 2013), with five or six participants per round being more common (Bhattacharjee, 2002; Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991; Tan et al., 2013), as shown in Table 7. Thus, based on previous research using the Q-sort procedure, this research sought about ten participants for each of the four rounds, with a minimum of five participants per round, well in line with previous IS research.

Characteristics of Raters

Raters were identified and selected based on specific relevant characteristics, with each of the first three rounds using raters with similar characteristics, in alignment with the rater selection process used by Storey et al. (2000). As with other Q-sorts, subject matter experts (Bhattacharjee, 2002; Moore and Benbasat, 1991; Segars and Grover, 1998; Storey et al., 2000) were chosen to participate in the various rounds. Three groups

were chosen as subject matter experts to analyze trust and distrust items. First, IS academics have similar training and background and are familiar with trust/distrust conceptualizations and were thus selected for Round 1. Second, IS professionals with knowledge of trust in a computing environment, as inferred from their titles, were selected for participation in Round 2. Similarly, IS undergraduate students were selected as subject matter experts for Round 3. As digital natives, undergraduate business students in an IS course are typically adept technology users (Dwyer et al., 2007). Because of their early adoption of technology and the amount of time they spend on technology daily, digital natives can achieve technology experience levels on par with more seasoned professionals (Smith, Anderson, and Rainie, 2012). Thus, IS academics, IS professionals, and IS students were selected as subject matter experts for this trust and distrust Q-sort process.

After deciding to use subject matter experts, rater groupings for the Q-sort process were decided. Whereas Moore and Benbasat (1991) used combined raters of “a secretary, administrative clerk, student and professor” (p 200) in each round, this research used three stratified rounds where like raters were grouped together for better pattern identification. After the first three rounds, a fourth round included a combined group of IS academics, IS professionals, and IS students for the final Q-sort. Thus, the participants selected for each round included groups of like respondents (IS academics, IS professionals, and IS students, in Rounds 1, 1.5, 2, and 3, respectively), followed by a mixed group of respondents for Round 4 (IS academics, IS professionals, and students combined), as shown in Table 8. This study did not solicit raters to respond in more than one round, eliminating potential knowledge or retest bias.

Categories

In each round, the raters were tasked with assigning individual items to one of several trust and distrust construct categories. In prior IS research using Q-sort, the number of construct categories studied has ranged from 2 to 16, as shown in Table 7, with some articles specifically stating an additional category was used for ambiguous or unclassifiable objects (Moore and Benbasat, 1991; Storey et al., 2000; Tan et al., 2013). Thus, this study also used various “other” categories to obtain richer, more useful data, in line with previous researchers, and to refine the items over time. By the last round of Q-sorting, all “other” category options were removed based on feedback and refinement during the previous rounds.

Item Selection and Refinement

Once the relevant rounds, raters, and categories were identified, as described in the previous section, item selection and refinement were undertaken.

Initial Items

To select items for inclusion in this study, an extensive search of prior literature (Cho, 2006; Dimoka, 2010; Gefen, 2002; Mascarenhas et al., 2006; McKnight and Choudhury, 2006; Moody et al., 2015) was conducted to identify validated trust and distrust instrument items. Moreover, a list of new trust and distrust items based on the keywords of Figure 1 was identified for inclusion. The combined list of items was refined through multiple steps, including rewording for clarity and better understanding, considered an acceptable practice by numerous researchers (Bhattacharjee, 2002; Davis, 1989; Hoehle and Venkatesh, 2015; Tan et al., 2013). Any items deemed to be a duplicate of another item or items considered ambiguous, confusing, or non-contributing

were eliminated (Bhattacharjee, 2002; Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991), in line with prior research. To eliminate numerous problems (Parasuraman, Berry, and Zeithaml, 1991) and potential bias as speculated by Dimoka (2010), negatively worded items were rephrased into positive statements. More importantly, negatively worded items were removed because, if trust and distrust are separate constructs, a negatively worded trust item does not measure high distrust; instead, it only indicates low trust, a misconception shown in some of the previous research on trust and distrust, and as articulated in Figure 2. Many items required rephrasing from their specialized contexts. Once these items were reworded to remove their context, they became duplicates of existing items. Removal of duplicates followed the process described above.

Once questions were modified, it was important to set the context for the participants in this story. The context of this survey is an e-commerce transaction, and as such, numerous questions were reworded as needed to fit the survey scenario and to be reusable and generalizable in e-commerce contexts in the future. Since participants were asked about their last mobile transaction, this study also made all questions past tense and replaced specific proper names used in previous studies, with a generic specifier instead. The combined list of items contained several exact and near duplicate items. Where duplicate questions were found, only one was kept, while items with basically similar wording were collapsed into a single question. The resulting set of initial items and their sources are shown in APPENDIX C, Table 41 through Table 52.

Table 8 Planned Q-sort Rounds

Planned Rounds	Rater Type	Rater Count
1	IS Academics	10
2	IS Professionals	10
3	IS Majors	10
4	IS Academics	5
	IS Professionals	5
	IS Majors	5
	Round 4 Total:	15

Reduction of Items Via Q-Sort

The item reduction process via Q-sort works by retaining items sorted consistently into any one category and dropping items that fail to achieve a majority consensus in any category. To allow for item count reduction, Q-sorting processes often start with a higher number of items than the expected end result as shown in Table 7, and as anticipated in this study. A detailed description of the item refinement process follows.

Item Refinement

With the initial items input into Qualtrics, the Q-sort procedure commenced, generally following the steps outlined by Straub (1989) and others, to ensure validity of instruments developed in the IS field. The first round of participants included IS academics only. Ten participants individually sorted a list of items into appropriate constructs. The accumulated trust and distrust items were provided to the raters in a single, randomly-sorted list. Raters arranged the items into bins representing each construct. The construct name and an operational definition were provided for each bin.

Item Categorization

Item refinement followed a two-fold process of analyzing the agreement between raters to determine if any raters were outliers and analyzing the categorization of items to determine if any items were outliers. The agreement between raters, described in the next section, used an average Cohen's Kappa (1960) and is called inter-rater reliability (IRR) in this study. The categorization of items, described in the following section, used the percentage of congruent categorization per item and is called inter-rater item (IRI) in this study. IRR was assessed prior to evaluating IRI; thus, this study ensured the raters were reliable through IRR prior to evaluating the items through IRI.

Inter-rater reliability (IRR).

Comparing similarity between two judges is straightforward. Two judges will either agree or disagree on each item. With per-item results of either 100% or 0%, after a series of ratings, an overall rater agreement can be calculated. Because some agreement between raters is expected to be by chance, Cohen's Kappa (1960) considers the amount of agreement between two raters in the context of possible rater agreement by chance. In simplistic terms, Cohen's Kappa is the amount of total agreement between two raters minus the amount of rater agreement expected by pure chance. Unfortunately, Cohen's Kappa is limited to exactly two raters (Fleiss, 1971). When analyzing rating from more than two raters, an average Cohen's Kappa (Fleiss, Levin, and Paik, 1981) can be calculated for each rater (Boudreau, Gefen, and Straub, 2001; Turel, Serenko, and Giles, 2011). This is the average result when every possible pairing is used to calculate a Cohen's Kappa for each pair. Since this study uses multiple raters to assess item fit, Cohen's Kappa was chosen to evaluate which items to keep and which to discard. As an

average, Cohen's Kappa of zero represents the amount of rater agreement expected by pure chance, and an average Cohen's Kappa below zero represents less than random agreement. In addition, average Cohen's Kappa values that are more than 2.5 standard deviations from the mean of all average Cohen's Kappa calculations for all raters may be considered an outlier, as recommended by Hair et al. (2010), and may be dropped from the analysis. In addition, items that failed to meet a minimum Cohen's Kappa of 0.40 were eliminated from consideration. These cutoff values and steps were used throughout the Q-sort analysis similar to the process used by Boudreau et al. (2001) and Tan et al. (2013). Hereinafter, Cohen's Kappa, which is a measure of inter-rater reliability, will be referred to as IRR. Inter-rater reliability (IRR) assessment contributed to achieving content validity as measured by an average Cohen's Kappa (Cohen, 1960).

Inter-rater item (IRI).

Once items were selected for inclusion, deletion, or refinement, based on IRR, an inter-rater item (IRI) measure was calculated. While IRR assesses rater reliability, IRI calculates the reliability of the item itself, or the percentage of raters who agree by categorizing the same item in the same category. This analysis indicates that not only do the raters agree on the specific items for inclusion, but that they put the same items in the same category. Previous Q-sorts and sorting procedures have used inter-rater item (IRI) measurement cutoffs of 0.50 for pairing frequency (Storey, Straub, Stewart, and Welke, 2000), 0.60 for item agreement (Hoehle and Venkatesh, 2015), and a 0.70 threshold for Cohen's Kappa (Tan, Benbasat, and Cenfetelli, 2013). Given the exploratory nature of this research, the number of items gathered from various sources, the number of newly created items, and the high number of constructs with shared communality, 0.60 was

chosen as the IRI cutoff. Using 0.60 (or 60%) as the minimum level of item agreement, items achieving at least 60% item agreement were kept as is or slightly reworded based on feedback from participants in the Q-sorting rounds. Items scoring less than 60% were either dropped or reworded. Throughout the Q-sort process, feedback was gathered from participants, and IRR and IRI were calculated and assessed. To enable distinction between IRR and IRI in this study, IRR is represented as a decimal, as in the 0.40 IRR cutoff, and IRI is represented as a percentage of agreement, as in the 60% agreement level.

Each subsequent round proceeded in a similar manner, with item refinement, elimination of duplicates, and removal of items as indicated, in Rounds 1 through 4. Respondents for Rounds 2, 3, and 4 proceeded according to plan and included IS professionals, IS students, and a combined group of IS academics, IS professionals, and IS students in Round 4. Each of these rounds built upon the feedback of the previous set of raters, contributing to face and construct validity. As before, any raters that fell below the minimum Kappa of 0.40 IRR were dropped from the analysis and any items that fell below the 60% IRI were discarded. These remaining questions constituted the survey instrument for subsequent rounds.

Field Test

After the trust and distrust items demonstrated discriminant validity between the constructs, and convergent validity overall, as indicated by the Q-sort, a field test was conducted to empirically test the model with an appropriate dependent variable. For the purpose of this test, the dependent variable of willingness to transact was chosen to indicate an individual's levels of trust and distrust in an e-commerce environment. Data

was collected from a sample of undergraduate business school students at two universities in the southeastern United States. Again, undergraduate students were selected as an appropriate respondent group, due to the reasons specified above.

Sample Characteristics

We anticipated an age range of 18 to 30 years old, with a media of approximately 20 years of age. Although use of a student sample is not appropriate for some studies, there are several additional reasons why use of a student sample is appropriate for this study in particular and did not compromise external validity (McKnight et al., 2002b). Examples of situations where a student sample use is not appropriate include asking students to imagine they are the CEO of a company, that they are a seasoned CPA, or any other case where traditionally aged students have little or no experience (McKnight et al., 2002b). In the context of e-commerce transactions, students may actually be the population segment with the most relevant experience, as compared to the less technologically-savvy members of other generations of users, such as Baby Boomers, Generation X, and Generation Y.

Qualtrics Survey

The identified participants completed an online Qualtrics survey relating to their most recent e-commerce transaction, “whether you did or did not complete the purchase.” Respondents were then asked if they ultimately did or did not complete that online purchase. For the rest of the survey, they were instructed to answer questions “thinking about the primary company involved in that most recent online experience ...” Respondents also provided demographic information, along with the IT artifact used when they made a purchase or considered making a purchase.

Control Variable

In addition, to asking the survey questions related to trust and distrust, we also collected information about the technology used (i.e., smartphone, tablet, laptop, desktop, etc.). Orlikowski and Iacono, (2001) noted the importance of considering the IT artifact used when evaluating the effects of technology. Other researchers (Markus and Robey, 1988) described how IT artifacts may be independent variables, dependent variables, or otherwise important variables to consider when evaluating organizational change. Sun and Bhattacharjee (2014) demonstrated how IT artifacts, in terms of their characteristics and complexity, served as moderators to ease of use, usefulness, and other variables. Furthermore, Al-Natour, Benbasat, and Cenfetelli (2011) described the importance of designing IT artifacts that are in line with the characteristics of the users who will be interacting with the technology artifact. This study evaluated the effect of the IT artifact used by the respondent. Thus, relevant IT artifacts for this study include smartphones, tablets, laptops, and desktop PCs. The trust or distrust that customers exhibit toward the organization may be mediated or moderated by their perceptions of trust and distrust in the IT artifact used. For instance, older customers may believe that desktop PCs are the IT artifact of choice and may trust transactions completed on the PC to be reliable and predictable. Conversely, customers who must use mobile technologies (smartphones, tablets, or laptops) may feel less comfortable with the IT artifact and possibly less trustful of completing e-commerce transactions in the unfamiliar environment. Other considerations include whether non-mobile environments are more secure than mobile environments. Thus, this paper moves toward an ensemble view of IT artifacts, as described by Akhlaghpour, Wu, Lapointe, and Pinsonneault (2013), considering the

technology itself (e.g., smartphone, desktop, in this study) and how it may be related to trust, distrust, and willingness to complete an e-commerce transaction.

Statistical Power

Prior to gathering data, the appropriate sample size was calculated. The most common method of determining sample size is statistical power. Statistical power tests determine the minimum sample size needed to find an effect if an effect is actually present. Cohen (1992; 1978) notes that researchers should estimate three of the following items to compute statistical power a priori: estimated effect size, alpha-value, sample size, and statistical power. In this study, the proper sample size was calculated using G*Power 3.1.9.2 (G*Power) (Faul, Erdfelder, Lang, and Buchner, 2007), a popular, well-tested, free software download. The tool is available at:

http://www.gpower.hhu.de/fileadmin/redaktion/Fakultaeten/Mathematisch-Naturwissenschaftliche_Fakultaet/Psychologie/AAP/gpower/GPowerWin_3.1.9.2.zip

To proceed with estimations for statistical power, several guidelines were reviewed. First, effect size was estimated. In general, Cohen suggests that small effect sizes are 0.02, medium effect sizes are 0.20, and large effect sizes are 0.35 (Cohen, 1988). Cohen (1992; 1978) provides additional guidelines, with modest effect sizes ranging from 0.10 for testing differences between populations to 0.20 for t-tests on the means of two independent samples. In lieu of t-tests, this research used the similar F-test to minimize the bias that would be introduced by performing multiple t-tests on means. Since effect sizes for t-tests are estimated at 0.20 (Cohen, 1992; Cohen and Daly, 1978), it suggests this research may have a similar effect size of 0.20. However, this research also used chi-square tests for goodness of model fit and analysis of variance to predict

differences in groups; both of those statistics have an estimated effect size of 0.10 (Cohen 1977, 1992). Thus, this study selected 0.15 as a modest effect size and a compromise between the 0.10 and 0.20 effect sizes suggested by prior research.

Next, alpha-value was determined. In line with previous researchers in management and other fields (Cashen and Geiger, 2004; Cohen, 1992; Cohen and Daly, 1978; Faul et al., 2007), the alpha error probability was set to 0.05 so as to maximize assurance in the results. If alpha levels are set higher, the chance of making a Type II error increases; that is, accepting the null hypothesis when it is in fact false (Cashen and Geiger, 2004). Also relevant in statistical power calculations are the number of predictors used in the model (Faul et al., 2007). In the trust-distrust model developed, the number of tested predictors is one (Willingness to Transact). To calculate statistical power using G*Power, the settings used were an F test for the test family, linear multiple regression: fixed model, R2 increase for the statistical test, and a priori for the type of power analysis.

At the estimated effect size of 0.15, using the F-test, G*Power calculated a target sample size of 89, with 67 as the lower range (effect size = 0.10) and 132 as the upper range (effect size = 0.20). However, since Cohen (1988) and Hair et al. (2010) both consider a statistical power of 0.80 or higher (with an alpha level of 0.05) to be sufficient for most business studies, the analysis was updated and re-run in line with those guidelines. At a statistical power of 0.80, with an estimated effect size of 0.10 or 0.20, using the same statistical tests mentioned earlier, G*Power calculated target sample sizes of between 42 to 81 respondents. Thus, in general terms, 42 to 132 participants were desired in order to achieve statistical power levels from 0.80 to 0.95 or higher.

Common Method Bias

Common method bias (CMB) refers to the error or bias or variance that occurs solely due to the method used; internal validity may be compromised if researchers fail to consider how to prevent and control for CMB (Gregor and Klein, 2014). Self-reports have inherent limitations due to the way they are designed, administered, and evaluated. Any study that uses self-reports to gather data runs the risk of CMB. However, this survey was designed to minimize CMB. At the outset, the survey items went through a rigorous Q-sorting methodology to carefully identify items for inclusion in the final survey. This thorough process of designing and validating items prior to implementation in a field test produced clear and unambiguous items, which has been shown to reduce CMB (Tourangeau, Rips, and Rasinski, 2000). Kim, Shin, and Grover (2010) concur, noting the importance of rigorous design of items to reduce the impact of CMB. In addition, respondents generally want to be associated with socially desirable outcomes (Donaldson and Grant-Vallone, 2002); that is, they may evaluate items (or factors) and respond in a “culturally acceptable and appropriate manner” (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003). One method of overcoming this potential bias is allowing respondents to remain anonymous. Since the researcher is unable to match responses to respondents, social desirability is not as much of a factor. In this study, students were not forced (or coerced) to participate in the survey but did so voluntarily, and no identifying information was collected. In addition, as recommended by Burton-Jones (2009), knowledge bias was reduced by collecting input from several distinct groups of raters: subject matter experts in the concepts of trust and distrust in e-commerce transactions, including IS academics, IS professionals, and IS students. Similarly, in the field survey,

knowledge bias was reduced by asking e-commerce customers to respond to survey items based on an actual e-commerce transaction they personally experienced rather than a simulated scenario.

Some seemingly simple steps may be undertaken to reduce the inherent method bias limitations of self-report survey instruments. For instance, Burton-Jones (2009) recommends using different types of questions (or statements) throughout the survey (e.g., Likert scales to express level of agreement with statements, simple yes/no questions where appropriate, and multiple-choice type questions that have one distinct answer). By varying the response type, raters are less likely to go through the survey, marking "Strongly Agree" on each choice, without reading. Thus, the respondents in this study used Likert scales, yes/no options to report if the online transaction was completed, type of technology used when considering the transaction (smartphone, laptop, tablet, netbook, or desktop), and multiple demographic questions, with varying numbers of response options. In an attempt to reduce cognitive load on respondents, the Qualtrics survey used piped-text reminders on each page (e.g., For the questions on this page, consider the benevolence of {OnlineVendorTextEntryValue}). Benevolence is defined here as the belief in the good intentions and kindness of another toward you). This survey design upfront was selected with a conscious intent to minimize method bias.

Further, Burton-Jones (2009) recommends minimizing method bias by asking the intrinsic trait responses before asking for the extrinsic trait responses, which was undertaken in this study. Similarly, Viswanathan (2005) recommends the order of setting the scenario, asking independent items, asking dependent items, then asking other items. This study implemented these suggestions by purposely presenting all items relating to

trust and distrust through Likert-scale responses prior to asking the extrinsic trait question of whether respondents completed the transaction or not, using a yes/no response.

With all the techniques and design elements available to reduce CMB, CMB could not be eliminated in this study. Respondents are asked to rate their own trust and distrust. Responses to online shopping questions have the potential for bias based on social desirability. Therefore, an assessment for CMB was conducted after data collection.

Exploratory Factor Analysis

After the Q-sort and collection of field data, analysis of the factor structure proceeded. First, since this study is exploratory in nature and does not have established items to measure constructs, exploratory factor analysis (EFA) using SPSS 25 was completed using the principle components analysis (PCA) method. PCA was chosen because, with the number of variables and the high communality among those variables, the results become similar to other methods (Snook and Gorsuch, 1989). An EFA allows for three basic options in regard to factor rotation: no rotation, orthogonal rotation, and oblique rotation. With no rotation, once the first factor is determined, all subsequent factors are defined in relation to the first. With rotation, starting with the second factor, the axes are rotated to redistribute the variance. With orthogonal rotation, correlation is zero and the factors are extracted based on this assumption. With oblique rotation, factors are extracted with some correlation allowed. Since the constructs are expected to be correlated, oblique rotation was selected. Gorsuch (1983) recommends rotating with promax oblique and seeking simple structure; that is, items that load high on one factor and close to 0 on others. Kim and Mueller (1978, p. 50) argue that, "If identification of

the basic structuring of variables into theoretically meaningful subdimensions is the primary concern of the researcher...almost any readily available method of rotation will do the job.” However, this study consciously chose a rotation scheme in which factors are expected to be correlated.

Confirmatory Factor Analysis

After the EFA, a series of confirmatory factor analyses (CFA) were completed. The final model suggested in the EFA was used as the starting point for the CFA. Each run followed the general process of calculating estimates, checking that a minimum was achieved, verifying that loadings were greater than 0.70, and then analyzing model fit. Model fit assessment and goodness of fit was evaluated with χ^2 , the χ^2 degrees of freedom, the χ^2 probability of significance, and the fit indices of comparative fit index (CFI) and root mean squared error of approximation (RMSEA).

Path Analysis

In this exploratory research, PLS-SEM was chosen because it examines the model to explain the variance in the dependent variables. Using the conceptual model proposed and the results of the EFA, PLS-SEM model analysis was performed with SmartPLS 3.0 (Ringle, Wende, and Becker, 2015). A measurement model was assessed, and after achieving reliability and validity of the constructs, the structural model was evaluated.

Although there is some discussion whether PLS-SEM is the correct tool in various situations (Goodhue, Lewis, and Thompson, 2012; Hair, Sarstedt, Hopkins, and Kuppelwieser, 2014), since this study is creating a new measurement of trust and distrust in an e-commerce environment and includes the development of second-order constructs, PLS-SEM is an appropriate technique (Petter et al., 2007; Ringle, Götz, Wetzels, and

Wilson, 2009). Through PLS-SEM, an analysis of whether trust and distrust are related to the willingness to transact was conducted. SmartPLS 3 offers a wide variety of settings, options, and choices that cover a multitude of models and various research situations. This section describes some of the more pertinent software setting choices made in the research analysis. The first setting option was the structural model path weighting method. The three options were centroid weighting scheme, factor weighting scheme, and path weighting scheme. While results are typically similar for all three weighting schemes (Hair et al., 2017), the path weighting scheme was selected since it is the recommended choice for most situations and provides the highest R^2 for endogenous latent variables; further, it is generally applicable to all kinds of models. In contrast, the centroid weighting scheme was not appropriate because the model under investigation contains higher order constructs (Hair et al., 2017).

PLS-SEM requires standardized data for indicators. In this version of SmartPLS, conversion of raw data into a standardized data is automatic. Before analysis began, PLS-SEM required all measurement model relationships be set to an initial value. The default setting in SmartPLS is to set these all to +1. An optional setting exists to set some or all initial weights to -1 although this could lead to confusing results of relationship outputs. In this research, all initial weights were set to +1.

PLS-SEM works iteratively by analyzing all indicators, constructs, and relationships based on the initial weights, then reweighting based on results. This process continues until one of two criteria is met: 1) either a solution is met based on the definition of stabilization, or 2) the maximum number of iterations is reached. The first stop criterion, stabilization, is reached when the sum of the outer weight deltas between

two iterations is below the defined total. The default stabilization stop criterion in SmartPLS is 0.0000001 (1×10^{-7}). The second stop criterion, the maximum number of iterations, prevents the software algorithm from getting stuck in an infinite loop. The default maximum number of iterations in SmartPLS is 300 iterations.

Quadrant Assessment via K-Means

After path analysis, K-means clustering was used to determine high and low levels of trust and distrust. The K-means cluster analysis is a procedure built into SPSS and not uncommon in IS research (Acquisti and Grossklags, 2005; Goes, Karuga, and Tripathi, 2012; Joseph, Boh, Ang, and Slaughter, 2012; H. Sun, 2012; Tjhai, Furnell, Papadaki, and Clarke, 2010). Specifically, Hsinchun Chen, Chiang, and Storey (2012) reference the IEEE 2006 International Conference on Data Mining (ICDM) as stating k-means was the second most influential data mining algorithm in business intelligence and big data analytics. To divide trust and distrust responses into groups of high and low, existing tools in SPSS were used (Hair et al., 2010). K-means clustering is a process that divides a data set into a predetermined number of segments through an algorithm that iteratively assigns cases to the groups then attempts to minimize the distance within groups and maximize the distance between groups. The K-means clustering provided output where every case is a member of one of two trust groups: low and high, and a member of one of two distrust groups, low and high. Because this analysis of high and low measures of trust and distrust is used to predict willingness to transact, and does not involve mediation, K-means clustering is the proper technique (Hair et al., 2010).

IT Artifact Assessment via PLS-MGA

Each respondent identified the type of IT artifact used when they completed or did not complete the online transaction. To test relationships between the IT artifact used and other variables, the significance of group differences was analyzed through multigroup analysis (PLS-MGA).

CHAPTER 4 RESULTS

This chapter focuses on the results of the analyses conducted to validate the trust-distrust survey and explore model fit. With the primary focus of instrument development and validation, the analysis proceeded with content validity, construct validity, reliability, and internal validity, followed by a statistical conclusion, as recommended by Straub (1989). The results include findings from the processes to create, validate, and empirically test a new survey instrument to measure trust and distrust. To validate the instrument, a description of how the survey items were gathered, selected, and prepared for a Q-sort procedure is discussed. Next, the data collection for the full field survey is described, and exploratory and confirmatory factor analyses are presented to refine the items. Then overall model fit is analyzed, followed by quadrant testing using PLS-MGA. The final section describes group testing based on the IT artifact, also using PLS-MGA.

Instrument Validation: Q-Sort Procedure

In the process of developing and validating an instrument to measure trust and distrust, refinement of the items was a necessary first step and was accomplished using Q-sort. Raters sorted the items into categories, with the goal to reduce the number of statements to the sets of items that measure the intended constructs. Items with higher levels of agreement between raters better represented the category as a construct and were thus retained for further review as the Q-sort process continued. Through putting like items together into a category, content validity was indicated, in that the items retained included all relevant components needed to measure the construct. Similarly,

grouping of categories signified construct validity, in that the items in each category, taken together, measured the construct. Finally, the separation of items into distinct categories signified discriminant validity. By proceeding through the Q-sort in a methodical and logical manner and refining the items over time, as described in detail throughout this chapter, validity of the instrument was supported.

Item Refinement

The first step toward creation of a survey instrument to measure trust and distrust and their subconstructs involved collecting previously validated trust and distrust items from several published research sources. A total of 129 items from these sources remained after the initial item selection and reduction process. An additional 40 items were generated from the trust, distrust, and resulting quadrant keywords as proposed by Lewicki et al. (1998) and the derivative work of Adler (2005). The resulting list of 103 unique trust and distrust items as shown in Appendix C, Table 41 through Table 52, was used as the input into the first Q-sort round. Items specific to a certain context, such as the medical profession, were reworded to be generic and apply to more general e-commerce contexts. Forty additional items were created based on the key words used by Lewicki et al (1998) as shown in Figure 1.

Raters were provided the survey questions to sort into categories of trust and distrust with additional categories to use if raters were unable to classify items into any of the category options. Once the raters completed their tasks, an inter-rater reliability (IRR) was calculated using an average Cohen's Kappa (1960). Items were first selected for inclusion, deletion, or refinement through analysis of IRR.

In addition to revising items based on IRR, rater feedback from each round was used to reword items for better clarity, understanding, and alignment with the construct definitions, as shown in Table 9, similar to the process used by other researchers (Bhattacharjee, 2002; Davis, 1989; Hoehle and Venkatesh, 2015). For example, during the item gathering phase, before the Q-sort process started, one trust item adopted from Cho (2006) was: “This e-vendor will operate its business in a highly dependable and reliable manner.” In order to generalize the question, it was reworded into “THEY operate THEIR business in a highly dependable and reliable manner.” Since this is a double-barrel (or multidimensional) question, the item was split into the two items: “THEY operate THEIR business in a highly dependable manner” and “THEY operate THEIR business in a highly reliable manner.” Because these two items are so close in meaning to each other as they relate to this study, “THEY operate THEIR business in a highly reliable manner” was kept and “THEY operate THEIR business in a highly dependable manner” was dropped. This pattern was repeated many times for double-barrel items that were split into unidimensional items. Similarly, negatively worded trust and distrust items were all converted to positively worded items. This is an important step because negatively worded trust items confound the difference between the low end of the trust scale and the high end of the distrust scale. However, as negatively worded items were converted into positively worded items, they often became a duplicate of an item already existing in the list. For example, when the item “I am unsure if THEY are genuine” adapted from McKnight and Choudhury (2006) was rephrased into the positively worded item of “I am sure THEY are genuine,” it became a near duplicate of the item “THEY are genuine.” adapted from Moody, Lowry, and Galletta (2015). In this

Table 9 Construct Definitions

Construct Name	Construct Definition	Items Table
Benevolence	the belief in the good intentions and kindness of another toward you	Table 42
Competence	the belief in the ability of another to do as they claim they will do	Table 43
Integrity	the belief in the honesty and truthfulness of another	Table 44
Malevolence	the belief in the bad intentions and ill will of another toward you	Table 46
Incompetence	the belief that another is inept to do as they claim they will do	Table 47
Deceit	the belief in the dishonesty and duplicity of another	Table 48
Indifference	simultaneous low trust and low distrust	Table 49
Reliance	simultaneous high trust and low distrust	Table 50
Wariness	simultaneous low trust and high distrust	Table 51
Confliction	simultaneous high trust and high distrust	Table 52

case the rephrased item adapted from McKnight and Choudhury (2006) was dropped, and the item adapted from Moody et. al. (2015) was kept. Similarly, several other pairs of items were deemed, by judgment call, close enough to be duplicates. In these cases, based on the levels of item agreement, IRR, and IRI, either the weaker of the two duplicates was dropped or the stronger item was reworded to better capture the constructs. Once these steps were completed, the initial set of 169 items was reduced to 103 items, as shown in Appendix C, Tables 36 through 47. These items were loaded into a Qualtrics survey for the Q-sorting procedure, and the next steps used several rounds of sorting to further refine and validate the instrument.

Results

This research has a two-fold goal: 1) to determine if individual trust and individual distrust should be measured separately or are opposite ends of the same

continuum; and 2) to develop a theoretically devised, valid, and reliable set of items to measure individual trust and individual distrust. In addition to these goals, post-hoc analyses provide an opportunity to evaluate the differences between quadrant groups, on a relevant downstream variable, and the effect of the IT artifact used on other variables in the model. Thus, the results are presented in three sections: results by round; field test results; and post-hoc analyses.

Results By Round

Throughout the rounds, items were refined, with deletion, refinement, and assurance of unidimensionality, as described previously. The sorting was completed online through Qualtrics. After each round, the refined set of items was then input into the next round. Similarly, categories were refined as indicated by participant feedback. Table 10 shows each round, the number of participants invited, the number of participants who responded, the response rate, the number of categories, the beginning number of items, and the number of items at the end of the round. The original list of 103 items was reduced to 38 items with high item agreement values, exhibiting content, convergent, discriminant, and construct validity. A discussion of each of the rounds follows.

Round 1

In the first round, IS academic sorters were provided the 103 items and asked to place each item into one of 10 categories: the three trust subconstructs of benevolence, competence, and integrity; the three distrust subconstructs of malevolence, incompetence, and deceit; and four categories for items that did not fit in the first six categories, including other trust, other distrust, other, and “I don’t know...?”. Of the 20 IS

Table 10 Actual Q-sort Rounds

Actual Rounds	Rater Type	Raters Invited	Rater Responses	Response Rate	Raters Retained	Q-sort in Qualtrics	AVG IRR*	Categories	Begin Items	End Items
1	IS Academics	20	11	55.0%	9	Ver 1	0.277	10	103	70
	Based on analysis, 33 items were dropped. Based on feedback, combined 3 items with others, redefined concepts, changed drag and drop to radio buttons, reduced 4 “other” categories to 3, added Round 1.5.									
1.5	IS Academics	9	6	66.7%	6	Ver 2	0.559	10	70	56
	Based on analysis, 14 items were dropped. Based on feedback, one spelling error corrected.									
2	IS Professionals	28	12	42.9%	12	Ver 3	0.618	7	56	56
	Based on analysis, 10 items were reworded/refined, 0 items were dropped									
3	IS Majors	35	18	51.4%	16	Ver 3	0.323	7	56	40
	Based on analysis, 16 items were dropped. Based on feedback, one punctuation error corrected.									
4	IS Academics	16	8	50.0%	5	Ver 3	0.722	7	40	38
	IS Professionals	31	13	41.9%	12					
	IS Majors	67	8	11.9%	7					
Based on analysis, 2 items were dropped										
*AVG IRR=average Inter-rater reliability, an overall average of each rater’s average Cohen’s Kappa										

academics invited to participate in the Round 1 Q-sort, 14 responded. Of these 14, 11 provided full and complete answers without missing data. The other three agreed to the consent form but stopped the exercise before submitting any useful input and were thus excluded from the analysis. This resulted in a useful response rate of 52.4%.

To evaluate the sorting results, an IRR was calculated for the raters by averaging each Kappa calculated for every possible rater pairing. Using the standard 0.40 cutoff for the IRR of Cohen's Kappa (Fleiss et al., 1981) on the 11 responses yielded unexpected results. Of the responses with an IRR below 0.40, the response with the lowest IRR was dropped and the IRR of all remaining rater's responses was recalculated. This process was repeated until the IRR of all remaining raters' responses was above 0.40. However, only four of the original 11 responses remained. Since the four responses left were below the previously determined minimum of five raters per round, we re-analyzed the cutoff criteria for outliers, lessening restrictions to only drop those raters whose IRR fell below zero or whose IRR was more than 2.5 standard deviations from the mean (Hair et al., 2010).

After revising cut-off values, Rater 11 was dropped for a negative IRR; then IRR was recalculated for all remaining pair combinations. Next, Rater 7 had a negative IRR and was thus removed. After subsequent recalculations, the IRR of all remaining raters was positive and less than 2.5 standard deviations from the mean.

Once IRR values were sufficient, IRI analysis commenced to evaluate the items. In total, 33 items did not exhibit consistent sorting into a particular category as evidenced by IRI values below the 60% threshold; thus, these items were dropped from the analysis, leaving 70 items for the next round.

In examining the items and gathering feedback from the participants, analysis showed that several items cross loaded into unexpected categories. A check of the definitions, as shown in Table 9, revealed the confusion and indicated the need for nuanced clarification. The definition of integrity was phrased as: the belief in the honesty, truthfulness, and good intentions of another. In contrast, benevolence was defined as: the belief in the kindness of another to do what is best for you. Clearly, the definition of integrity contained the concept of “good intentions,” which is more typically associated with benevolence. Based on feedback in this round, all of the definitions were re-examined. Similar to the integrity/benevolence overlap, the initial definition of deceit overlapped with benevolence. Deceit was initially defined as: the belief in the dishonesty and bad intentions of another, while malevolence was framed as: the belief that another has ill will toward you. Thus, “bad intentions” in the definition of deceit overlapped with the bad intentions implied by malevolence. The definitions were reworded, as shown in the differences between Table 11 and Table 12, to more accurately define the differences between constructs. Since substantial changes were made, and clarity was added, an additional round, with IS academics as the raters, was added (labelled round 1.5).

Round 1.5

Round 1.5 sought five IS academic raters to add input by sorting with the revisions made. The nine members of the initial group of IS academics from Round 1 who did not complete a response were invited to Round 1.5. Of these, six participated, for a response rate of 66.67%. An analysis of the IRR for each rater of Round 1.5 revealed that all six raters had a positive IRR above 0.40, and each was within 2.5 standard deviations of the mean. Thus, analysis proceeded to the items. With the corrected

Table 11 Original Construct Definitions Used in Round 1

Construct Name	Definition (used in Round 1)
Benevolence	the belief in the kindness of another to do what is best for you
Competence	the belief in the ability of another to do as they claim they will do
Integrity	the belief in the honesty, truthfulness, and good intentions of another
Malevolence	the belief that another has ill will toward you
Incompetence	the belief that another is inept in their ability to do as they claim they will do
Deceit	the belief in the dishonesty and bad intentions of another
Other: trust	trust related but not one of the above
Other: distrust	distrust related but not one of the above
Other	these items all group together under a different term
I don't know...?	these miscellaneous items don't fit anywhere else

Table 12 Updated Construct Definitions Used in Round 1.5 and All Remaining Rounds

Construct Name	Definition (used in Round 1.5 and all remaining rounds)
Benevolence	the belief in the good intentions and kindness of another toward you
Competence	the belief in the ability of another to do as they claim they will do
Integrity	the belief in the honesty and truthfulness of another
Malevolence	the belief in the bad intentions and ill will of another toward you
Incompetence	the belief that another is inept to do as they claim they will do
Deceit	the belief in the dishonesty and duplicity of another
Other	non-classifiable items or items that don't fit anywhere else

definitions, the results were much more in line with what was anticipated. Over half of the items were categorized with IRI values of 100% agreement or one less than 100%. The eleven items with an IRI less than 60%, per the guidelines set in the methodology section, were dropped. Three items deemed essentially duplicates of other items were removed. One spelling error was corrected. With 14 items dropped from 70, 56 items remained for Round 2.

Round 2

In Round 2, a search of IS professionals was conducted in the list of LinkedIn contacts of the primary researcher. Twenty-eight IS professionals were found with position titles ranging from technician and engineer to director of IT, CIO, and owners of IS/IT consulting companies. Of these, twelve completed the sorting exercise, for a response rate of 42.86%. An analysis of the IRR for each rater revealed that all twelve raters had a positive IRR above 0.40 and within 2.5 standard deviations of the mean. Analysis proceeded to an examination of the items using IRI. Of the 56 remaining items, ten scored below 60% in agreement rates. Because deletion of all these items would have dropped malevolence to only four remaining items, the low scoring items were reworded for additional clarity and understanding. The revised set of 56 items was used as the input for sorting for Round 3.

Round 3

In Round 3, undergraduate students in an IS major specific course were invited to participate. One section of a computer security course with 35 students was chosen. In accordance with IRB approval, this phase of the data collection was conducted anonymously. A random drawing for a \$20 Amazon gift card was offered as an incentive for completed sorting exercises. A total of 18 completed responses were collected, for a response rate of 51.43%.

Analysis of the data through IRR and IRI proceeded. Responses from raters with an IRR of 0.40 or less, representing less than random agreement, were dropped, in accordance with guidelines discussed earlier. Thus, Rater 9 was dropped for a negative IRR. After a Kappa for all pair combinations was recalculated, Rater 7 was dropped for a

negative IRR as well. At that point, all IRR values were positive, 0.40 or higher, and each was less than 2.5 standard deviations from the mean. Since the raters were in agreement, the analysis proceeded to IRI for item analysis.

Round 3 item analysis next showed that 16 items fell below the 60% IRI threshold. Because all subconstructs would be left with a minimum of least five items, these 16 items were dropped. As a minor edit, an ending period was added to three other items for visual consistency. This left 40 items for Round 4.

Round 4

Round 4 sought input from a combined group of IS academics, IS professionals, and undergraduate students in a computer science major-specific security course. Sixteen IS academics were invited from the faculty list of a computer science and information systems department of a southeastern public university. Thirty-one IS professionals were invited from an information technology department at a southeastern public university. Based on titles listed, all employees working in the areas of security, networking, or IT-related upper management positions were selected. Part-time employees and those working in areas such as audio visual, helpdesk, and technical support were not invited to participate in this exercise. IS students from two sections of the same computer security course were chosen to avoid duplication of invitations. A total of 67 students were enrolled in these two classes. In accordance with IRB approval, this phase of the data collection was conducted anonymously. A random drawing for one \$20 Amazon gift card was offered to each class as an incentive for completed sorting exercises. Of these solicited participants, five IS academics, twelve IS professionals, and seven IS students

completed the sorting exercise, with response rates of 31.3%, 38.7%, and 10.4% respectively.

The Round 4 raters' responses were analyzed, and raters with an IRR below 0.40 or an IRR more than 2.5 standard deviations from the mean were removed (Hair et al., 2010). As shown in Table 13, Rater 3 was dropped for a negative IRR. After each drop, the IRR was recalculated. In subsequent analyses, Raters 2, 27, 21, and 29 were dropped for an IRR greater than 2.5 standard deviations from the mean. At that point, all IRR calculations were above 0.40, and each was less than 2.5 standard deviations from the mean. With IRR results indicating rater reliability, the next step analyzed the individual items.

Round 4 item analysis revealed one item with an IRI below 0.60; therefore, this item was dropped. Upon close analysis, an additional item had been reworded into an almost duplicate of an existing item; thus, one of the duplicate items was dropped. At the end of Round 4, the remaining 38 items for the three subconstructs of trust and the items for the three subconstructs of distrust were finalized for the full field survey data collection. The final items for each subconstruct are shown in Table 14.

Field Test Results

Once the items were refined using a rigorous Q-sort procedure, an empirical test was conducted to test the model, based on Figure 1. The empirical test used a new, larger sample to further refine the trust-distrust items and to analyze the network of associations around trust, distrust, and willingness to transact. The 38 items retained from the Q-sort procedure were used as measures of trust and distrust.

Table 13 Round 4 Rater Outliers

RATER	AVG KAPPA	STD. DEVS.	OUTLIER REASON TO DROP RATER'S RESPONSES
Rater 3	-0.032	-2.866	negative average Cohen's Kappa
Rater 2	0.085	-2.822	more than 2.5 standard deviations from the mean
Rater 27	0.182	-2.837	more than 2.5 standard deviations from the mean
Rater 21	0.246	-3.053	more than 2.5 standard deviations from the mean
Rater 29	0.293	-3.585	more than 2.5 standard deviations from the mean

Statistical Power

To reach satisfactory statistical power, a sample size of 42 to 132 participants was desired, depending on effect size. With 112 participants in the study, actual statistical power levels ranged from 0.91 (effect size = 0.10) to greater than 0.95 (effect size = 0.20). Since Cohen (1988) and Hair et al. (2010) both consider a statistical power of 0.80 or higher (with an alpha level of 0.05) to be sufficient for most business studies, the statistical power was deemed to be satisfactory.

Participants

Undergraduate business students, in a required information systems course at two universities, were invited to participate in the survey. Per IRB requirements, the survey was voluntary and anonymous. Students were not contacted directly through their University email addresses, which are considered confidential and cannot be shared beyond the classroom. Instead, invitations were distributed via a recruitment flyer in PDF format provided to the class instructor for distribution to the students and subsequent posting online in the course management systems of the respective universities. The first university (U1) had a total of 563 students in thirteen sections taught by nine instructors.

Table 14 Final Q-sort items for field survey for trust subconstructs

CONSTRUCT	SURVEY ITEMS (TRUST SUBCONSTRUCTS)	SURVEY FINAL
Benevolence	I expect THEIR intentions are caring.	BEN1
	I expect THEY are well meaning.	BEN2
	THEY care about Me as a customer.	BEN3
	THEY strive to work for my best interests.	BEN4
	THEY make sure my transactions with THEM are a great benefit to me.	BEN5
	THEY keep my best interests in mind.	BEN6
	THEY are likely to make sacrifices for me, if needed.	BEN7
Competence	THEY are competent in providing the product or service.	COM1
	THEY are knowledgeable about the products (or services) THEY sell.	COM2
	I believe THEY can complete my transaction successfully.	COM3
	THEY understand the market THEY work in.	COM4
	THEY know how to provide excellent service.	COM5
	THEY perform THEIR role of providing the product or service very well.	COM6
	THEY have the expertise to understand my needs.	COM7
	THEY will deliver this product according to the posted delivery terms.	COM8
	I totally depend upon THEIR knowledge and skills.	COM9
Integrity	THEY are honest.	INT1
	THEY are truthful in THEIR dealings.	INT2
	THEY keep THEIR promises.	INT3
	THEY are genuine.	INT4

The primary researcher made a personal visit to four of the 13 classes taught at UI.

Participants provided 75 usable responses resulting in a response rate of 13.3%. The second university (U2) had 257 students in seven sections taught by four professors. The primary researcher made a personal visit to three of the seven classes. U2 participants provided 37 usable responses resulting in a response rate of 14.4%. See Table 15 for details.

Because this study fell under separate IRB approvals at each university, two nearly identical surveys were created in Qualtrics. At U1, respondents were asked to consider their last ecommerce shopping experience, whether the purchase was completed or not completed. Since almost all of the students from U1 indicated that they completed the ecommerce transaction, the survey for U2 asked the respondents to specifically consider their last ecommerce shopping experience that was not completed. Thus, it was anticipated that substantially more U1 respondents would have completed the purchase as compared to U2; similarly, it was expected that significantly more U2 students than U1 would not have completed the purchase. The other differences between the two universities were the required consent forms, unique dropdown lists for the student's academic major, and the color scheme representing the school colors. All other content, instructions, and items were the same in both surveys. As an incentive for completed survey responses, a random drawing for one \$25 Amazon gift card was offered for every 25 completed responses received.

As Table 15 shows, the response rate for the two universities were similar, at 13.3% and 14.4%, respectively. Overall, 65% of the respondents reported completing the transaction in question, with 35% reporting that they did not complete the transaction. Since the survey asked students at U2 to consider a transaction they had not completed, it was not unexpected that almost 80% of those students responded "no," that they had not completed the transaction in question. At the first university, almost 90% reported that they had completed the transaction, by responding "yes." Overall, 112 students participated in the study, with 75 students from U1 and 37 students from U2.

Table 15 Field Survey Response Rates

Response Rates	Target Audience	Usable Responses	Response Rate	Completed Transactions	Uncompleted Transactions
University #1	563	75	13.3%	87%	13%
University #2	257	37	14.4%	22%	78%
TOTAL	820	112	13.7%	65%	35%

As shown in Table 16 and Table 17, the average age across both schools was 24.5, with students at U1 averaging 25.6 years and students at U2 averaging 22.4 years. The age was slightly higher than anticipated, but the average age still included predominantly digital natives, the desired participants for the study. Overall, 48 males and 64 females completed the study; the majority of the respondents reported that they were White and not of Hispanic or Latino descent. Almost all students reported majors in business-related fields, with accounting, marketing, and management majors comprising the largest groups. Across both universities, students tended to make purchases on smartphones (42) or laptops (61). Only six students reported making the purchase on a desktop, while two reported they used a tablet, and none used a netbook.

Data Cleanup

The Qualtrics data file was downloaded and imported into Excel to reformat the data for the next step. Two respondent text entries contained commas which caused import errors. The offending commas were removed. The first of three heading rows was kept while the other two were deleted. Any response rows with less than 88%

Table 16 Demographics

Demographics				
		U1	U2	Total
AGE	Minimum	20	19	19
	Maximum	54	35	54
	Average	25.6	22.4	24.5
SEX	Male	32	16	48
	Female	43	21	64
RACE	White	58	35	93
	Asian	5		5
	Black or African American	12		12
	American Indian or Alaska Native		2	2
ETHNICITY	Not Hispanic or Latino	65	35	100
	Hispanic or Latino	10	2	12
EDUCATION	High school or GED equivalent	1		1
	Some college (freshman level completed)	2	2	4
	Some college (sophomore level completed)	23	12	35
	Some college (junior level completed)	45	22	67
	College undergraduate degree completed	4	1	5
ACADEMIC MAJOR	Accounting	18	2	20
	Construction Management	2		2
	Entrepreneurship	1		1
	Finance	7	6	13
	Information Security and Assurance	4		4
	Information Systems	4	1	5
	International Business	4		4
	Management	16	15	31
	Marketing	18	12	30
	Professional Sales	1		1
	Psychology		1	1
	Total	75	37	112

Table 17 Demographics Continued

Demographics continued				
		Univ 1	Univ 2	Total
TECHNOLOGY TO CONDUCT TRANSACTION	Smartphone	29	13	42
	Tablet	1	1	2
	Laptop	40	21	61
	Desktop	4	2	6
E-COMMERCE TRANSACTIONS IN THE PAST MONTH	0	3		3
	1	10	4	14
	2	14	8	22
	3	19	5	24
	4	13	7	20
	5	8	7	15
	6	3		3
	7		2	2
	10 or more	5	4	9
	Total	75	37	112

completion, as measured by the percentage of survey questions answered, were deleted. Fourteen response rows had between 2% and 12% completion meaning the participants stopped responding early in the survey; therefore these partial responses are unusable and were dropped. After the survey was announced and open to U1, it was discovered that direct measures of the two second order constructs necessary for model analysis were inadvertently omitted. These two items were quickly added to the survey, but not before 10 respondents had already completed the survey. These 10 cases were used for the confirmatory factor analysis and exploratory factor analysis calculations and then dropped for the overall model fit analysis.

Common Method Bias

Even with properly designed items to minimize the effect of common method bias (CMB), it cannot be eliminated and may still be a problem. While there are numerous methods of statistically testing for CMB, probably the most used method is Harman's 1-factor test. If a single common factor explains a large portion of the variance, CMB may be a problem. Thus, the entire set of 38 trust and distrust subconstruct items was loaded into SPSS 25, and the Harman's single-factor test was completed. This test is an EFA run with the SPSS command: Analyze, Dimension Reduction, Factor, with no rotation. Fitting a single common-factor to all items explained only 46.021% of the variance. Because a single factor explained less than 50% of the variance, this output indicated common method bias is likely not a problem with this data set (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). By intentionally designing to reduce CMB and by statistically testing after data collection to determine the potential effect of CMB, results suggested that CMB was not a substantial problem or source of significant error in this study. Once statistical power was assessed and potential CMB was addressed, this study moved to exploratory factor analysis (EFA).

Exploratory Factor Analysis (EFA)

An EFA was performed on the 38 items comprising the six subconstructs of trust and distrust following best practices (Hair et al., 2010). In total, three EFA runs were performed each with the promax oblique rotation, obtaining the number of factors based on eigenvalues. The result was a solution with five factors as shown in Table 18. With this analysis, all of the items of the subconstruct of integrity were eliminated, and COM9 was combined with the benevolence items; in addition, COM9 and DEC1 cross-loaded

onto a second factor, which does not match theory and fails to achieve simple structure. Since this outcome does not have theoretical support and fails to reach a simple structure, other models were examined for better fit.

Second, a promax oblique rotation was used, but this time, the model was forced into six factors as predicted by theory. In this model, the sixth factor was the single item of COM2 as shown in Table 19. Once again, all the items of the subconstruct of integrity were eliminated with COM9 combined with the benevolence items. Similarly, COM9 and DEC1 showed multidimensionality, cross-loading onto two factors. Since this model does not match theory and fails to reach a simple structure, a final model was examined.

The final EFA run was made with promax oblique rotation forced into six factors as predicted by theory, but with the choice to remove individual items one by one. In this way, items were allowed to be eliminated one at a time based on theoretical rationale and input from prior runs. Based on what was learned in the previous runs, COM2 was removed first to eliminate the possibility it could load on its own factor, the result achieved in prior analyses. After removing a total of five items from competence, one item from benevolence, one item from deceit, and three items from integrity, this EFA run resulted in a solution with six factors representative of what the theory predicts, as shown in Table 20. Clearly, simple structure is achieved, with no significant cross-loadings of items onto more than one factor. This solution was selected to proceed with further confirmatory analysis. Table 17 through Table 20 summarize the three EFA runs made, while Table 21 shows the final items used in the analysis.

Table 18 Promax rotation, factored based on Eigenvalues

Pattern Matrix					
	Component				
	1	2	3	4	5
BEN1	0.842				
BEN7	0.834				
BEN4	0.823				
COM9	0.815				-0.450
BEN6	0.783				
BEN2	0.737				
BEN3	0.640				
DEC3		0.977			
DEC2		0.927			
DEC4		0.891			
DEC6		0.767			
DEC5		0.669			
DEC1		0.613			0.414
MAL2			0.943		
MAL3			0.913		
MAL4			0.876		
MAL5			0.726		
MAL1			0.677		
COM6				0.954	
COM1				0.891	
COM3				0.824	
COM8				0.761	
COM5				0.652	
INC3					0.855
INC4					0.770
INC1					0.765
INC2					0.752

Table 19 Promax rotation, forced into 6 factors

Pattern Matrix						
	Component					
	1	2	3	4	5	6
BEN7	0.856					
BEN1	0.849					
BEN4	0.846					
BEN6	0.802					
BEN2	0.749					
BEN3	0.700					
COM9	0.670				-0.404	
DEC3		0.960				
DEC2		0.911				
DEC4		0.877				
DEC6		0.754				
DEC5		0.661				
DEC1		0.603			0.414	
MAL2			0.942			
MAL3			0.909			
MAL4			0.875			
MAL5			0.726			
MAL1			0.677			
COM6				0.937		
COM1				0.880		
COM3				0.811		
COM8				0.753		
COM5				0.649		
INC3					0.871	
INC1					0.799	
INC4					0.786	
INC2					0.779	
COM2						0.958

Table 20 Promax rotation, forced into 6 factors, delete COM2 first

Pattern Matrix						
	Component					
	1	2	3	4	5	6
BEN4	0.911					
BEN6	0.851					
BEN7	0.835					
BEN1	0.769					
BEN3	0.689					
BEN2	0.652					
MAL2		0.943				
MAL3		0.912				
MAL4		0.871				
MAL5		0.731				
MAL1		0.677				
DEC3			0.920			
DEC2			0.878			
DEC4			0.871			
DEC6			0.802			
DEC5			0.785			
INC3				0.905		
INC4				0.864		
INC2				0.863		
INC1				0.838		
COM6					0.887	
COM8					0.829	
COM1					0.812	
COM3					0.752	
INT1						0.867
INT2						0.802
INT3						0.666
INT4						0.639

Table 21 Items Dropped Per Exploratory Factor Analysis Run

Promax (Eigenvalue)	Promax (Force 6)	Promax (Force 6)
		delete COM2 first
BEN5	BEN5	COM2
COM2	COM4	COM7
COM4	COM7	COM4
COM7	INC5	COM9
INC5	INC6	BEN5
INC6	INC7	DEC1
INC7	INT1	INC5
INT1	INT2	INC6
INT2	INT3	INC7
INT3	INT4	COM5
INT4		

Table 22 Survey Items after EFA Final Run

SURVEY ITEMS	ADAPTED FROM (OR NEW)	EFA ITEMS
I expect THEIR intentions are caring.	Gefen (2002)	BEN1
I expect THEY are well meaning.	Gefen (2002)	BEN2
THEY care about Me as a customer.	Dimoka (2010)	BEN3
THEY strive to work for my best interests.	new item	BEN4
THEY keep my best interests in mind.	Dimoka (2010)	BEN6
THEY are likely to make sacrifices for me, if needed.	Dimoka (2010)	BEN7
THEY are competent in providing the product or service.	Moody et al. (2015)	COM1
I believe THEY can complete my transaction successfully.	new item	COM3
THEY perform THEIR role of providing the product or service very well.	Moody et al. (2015)	COM6
THEY will deliver this product according to the posted delivery terms.	Dimoka (2010)	COM8
THEY are honest.	Moody et al. (2015)	INT1
THEY are truthful in THEIR dealings.	Moody et al. (2015)	INT2
THEY keep THEIR promises.	Gefen (2002)	INT3
THEY are genuine.	Moody et al. (2015)	INT4
THEIR motive is to cause harm.	Mascarenhas et al. (2006)	MAL1
If I continue dealing with THEM, THEY will do something detrimental to me.	new item	MAL2
I am bothered by THEIR malicious objectives.	Mascarenhas et al. (2006)	MAL3
THEY are likely to engage in a harmful behavior toward me.	Dimoka (2010)	MAL4
THEIR unethical practices are injurious to me.	new item	MAL5
I doubt THEIR competence.	Mascarenhas et al. (2006)	INC1
I worry THEY are incapable.	McKnight and Choudhury (2006)	INC2
I have no confidence in THEIR ability.	Mascarenhas et al. (2006)	INC3
THEY are incompetent in THEIR area of expertise.	Moody et al. (2015)	INC4
THEY would tell a lie if THEY could gain by it.	Moody et al. (2015)	DEC2
I worry THEY are untruthful in THEIR dealings.	Dimoka (2010)	DEC3
THEY don't have high standards of honesty.	Moody et al. (2015)	DEC4
THEY would cheat on THEIR financial statements if THEY thought THEY could get away with it.	Moody et al. (2015)	DEC5
I believe THEY perform fraudulent transactions.	Dimoka (2010)	DEC6

Confirmatory Factor Analysis (CFA)

As shown in Table 20, the resulting exploratory factor analysis (EFA) solution of six theory-predicted constructs was used as the starting model of a confirmatory factor analysis (CFA) in AMOS version 25 following best practices (Hair et al., 2010). Ideally, the data collection would have resulted in a sample large enough to divide into two independent samples, completing EFA on one sample, followed by CFA on the other. In consideration of time, the CFA proceeded with the same data set⁵.

During the CFA, several runs were made. As described in Chapter 3 – Method, each run followed the general process of calculating estimates, checking that a minimum was achieved, verifying that loadings were greater than 0.70, and then analyzing model fit using χ^2 , the χ^2 degrees of freedom, the χ^2 probability of significance, and the fit indices of comparative fit index (CFI) and root mean squared error of approximation (RMSEA). The CFA analysis continued until the model assessment indicated a p-value greater than 0.05, representing an insignificant χ^2 , a CFI greater than 0.95, and a RMSEA less than 0.08 (Hair et al., 2010).

⁵ For the purpose of experience in conducting these analyses, the same data set was used for both the exploratory factor analysis and the confirmatory factor analysis. It is acknowledged that use of the same data set for both tests yields little new information at best and unreliable or deceptive results at worst due (Henson and Roberts, 2006). Furthermore, without a second data collection, it is not proper to conduct a confirmatory factor analysis during instrument validation (Byrne, 2016). It should be noted that any further publication of results of this study will either omit this confirmatory factor analysis or collect new data for a new confirmatory factor analysis.

Upon the first CFA run in AMOS, all loadings were greater than 0.70 and minimum was achieved, so analysis proceeded to the assessment and goodness of fit measurements. With a χ^2 of 639.908, 335 degrees of freedom, and a probability level of 0.000, χ^2 was significant. The CFI was 0.896 which was below the target minimum of 0.95 and RMSEA was 0.09 which was above the target maximum of 0.08.

Since there was no fit with the model as tested, the first step to clean up the measurement model was to delete weak measures as recommended by Hair et al. (2010). A check of the modification indices (MI) showed several regression weights above 10. One way to reduce χ^2 is to draw a covariance arrow between two error terms as long as they are on the same construct; this arrow will reduce χ^2 by the amount shown in the MI column. In this run, the largest regression weight for the MI column was between e2 and e3. Because e2 and e3 are connected to items on the same construct, as shown in Figure 4 an arrow was drawn between them to covary the error terms. Another CFA run was completed in AMOS, and the output analyzed in the manner described above. In subsequent CFA runs, covariance arrows were drawn between e25 and e28; e24 and e28; and e13 and e14. Once no additional error term pairs resulted in regression weights over 10, model fit continued by eliminating items with the most standardized residual covariances as recommended by Hair et al. (2010). The CFA continued for several more runs until the probability level was not significant. While the probability level was still significant, after each run, the item with the largest discrepancy between estimated and observed covariance (highest standardized residual covariance) was eliminated, as shown in Table 23. These items may be casualties of using the same data for EFA and CFA or of something peculiar to this specific sample. Ultimately, eight items were eliminated in 13

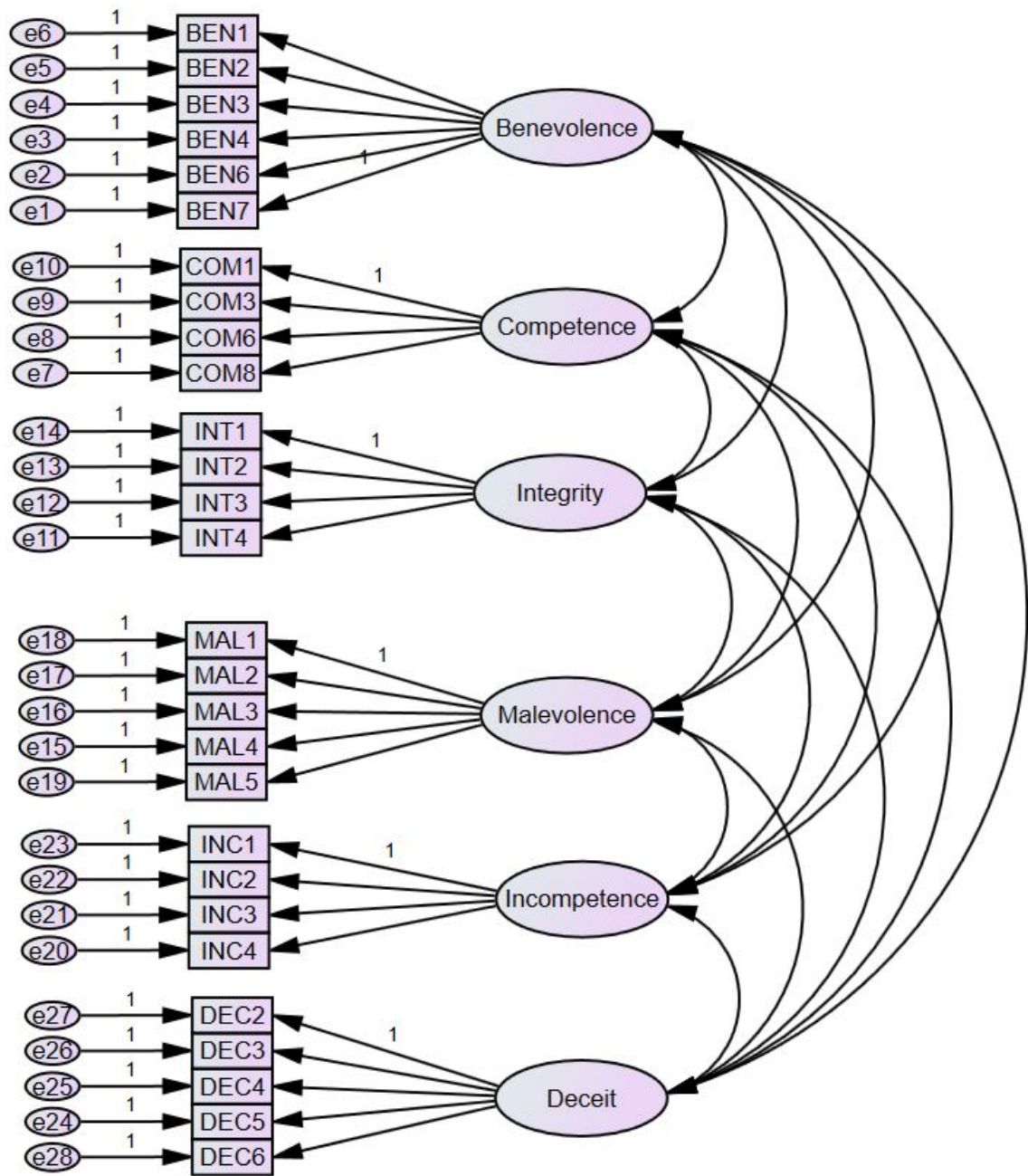


Figure 4 CFA starting model in AMOS 25

runs: two items from deceit; one item from malevolence; three items from benevolence; and one item each from integrity and competence. See Table 23 for details of the actions taken and the model measurement results for each run.

Table 23 Confirmatory Factor Analysis Measurement and Actions

RUN	χ^2	df	P	CFI	RMSEA	ACTION
1	639.908	335	0.000	0.896	0.090	covary e2↔e3
2	607.215	334	0.000	0.907	0.085	covary e25↔e28
3	584.185	333	0.000	0.914	0.082	covary e24↔e28
4	569.680	332	0.000	0.919	0.080	covary e13↔e14
5	556.689	331	0.000	0.923	0.078	delete Q53=DEC5
6	471.847	306	0.000	0.941	0.070	delete Q35=MAL1
7	415.382	281	0.000	0.950	0.065	delete Q14=BEN3
8	365.836	257	0.000	0.958	0.061	delete Q17=BEN6
9	330.455	235	0.000	0.961	0.060	delete Q54=DEC6
10	295.938	214	0.000	0.964	0.058	delete Q15=BEN4
11	251.866	193	0.003	0.973	0.052	delete Q30=INT1
12	213.897	174	0.021	0.981	0.045	delete Q22=COM3
13	175.528	155	0.124	0.989	0.034	P not significant

The final CFA run shows a non-significant χ^2 indicating a probability that the model has achieved fit. The model selected showed a χ^2 of 175.528, 155 degrees of freedom, and a probability level of 0.124, meaning χ^2 was not significant. CFI was 0.989 which was above the target minimum of 0.95 and RMSEA was 0.034 which was below the target maximum of 0.08. The model was supported with theoretical rationale and exhibited simple structure; thus, model fit was achieved. The final CFA model with measurements, as shown in Figure 5, shows that, based on larger variance estimates, incompetence, benevolence, and deceit are better predictors than competence, integrity, and malevolence, and may warrant more attention by researchers. Once CFA was completed, each of the subconstructs of interest included three or four items, which follows recommendations for survey administration. Table 24 shows the 20 remaining items after model fit was achieved, reduced from the 38 items in the starting CFA.

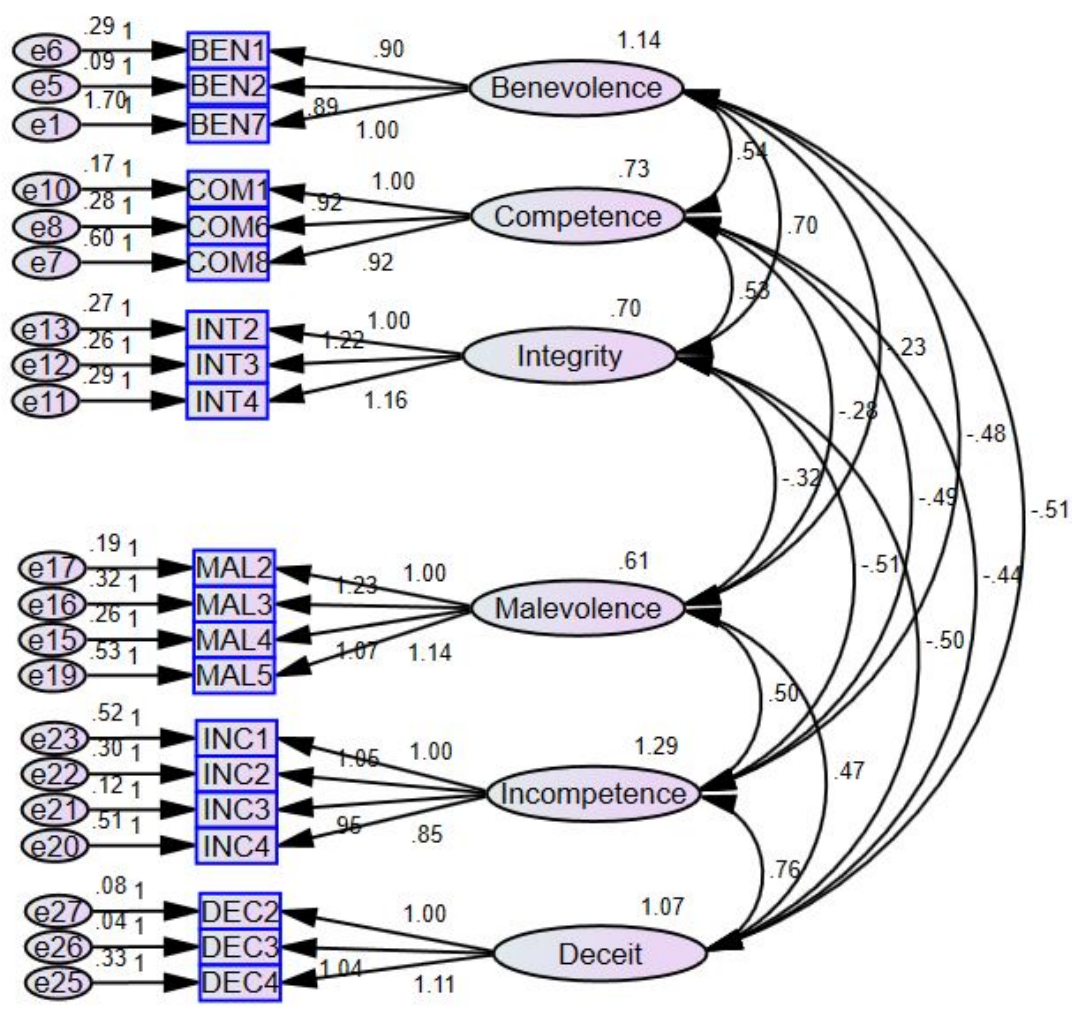


Figure 5 Final CFA model with measurements

Table 24 Survey Items after CFA Final Solution

SURVEY ITEMS	ADAPTED FROM (OR NEW)	CFA FINAL
I expect THEIR intentions are caring.	Gefen (2002)	BEN1
I expect THEY are well meaning.	Gefen (2002)	BEN2
THEY are likely to make sacrifices for me, if needed.	Dimoka (2010)	BEN7
THEY are competent in providing the product or service.	Moody et al. (2015)	COM1
THEY perform THEIR role of providing the product or service very well.	Moody et al. (2015)	COM6
THEY will deliver this product according to the posted delivery terms.	Dimoka (2010)	COM8
THEY are truthful in THEIR dealings.	Moody et al. (2015)	INT2
THEY keep THEIR promises.	Gefen (2002)	INT3
THEY are genuine.	Moody et al. (2015)	INT4
If I continue dealing with THEM, THEY will do something detrimental to me.	new item	MAL2
I am bothered by THEIR malicious objectives.	Mascarenhas et al. (2006)	MAL3
THEY are likely to engage in a harmful behavior toward me.	Dimoka (2010)	MAL4
THEIR unethical practices are injurious to me.	new item	MAL5
I doubt THEIR competence.	Mascarenhas et al. (2006)	INC1
I worry THEY are incapable.	McKnight and Choudhury (2006)	INC2
I have no confidence in THEIR ability.	Mascarenhas et al. (2006)	INC3
THEY are incompetent in THEIR area of expertise.	Moody et al. (2015)	INC4
THEY would tell a lie if THEY could gain by it.	Moody et al. (2015)	DEC2
I worry THEY are untruthful in THEIR dealings.	Dimoka (2010)	DEC3
THEY don't have high standards of honesty.	Moody et al. (2015)	DEC4

Post Hoc Analyses

PLS-SEM Model Analysis

While the goal of this study is development of valid and reliable methods of measuring trust and distrust, the scale developed was tested using the results of the field study. Using the conceptual model proposed and the results of the EFA, PLS-SEM model analysis was performed with SmartPLS 3.0 (Ringle et al., 2015). Then the path model was assessed, followed by checking the measurement model for reflective constructs to assess internal consistency, convergent validity, and discriminant validity. Then the structural model was evaluated. Throughout this section, the size and significance of the path coefficients is assessed, as well as the coefficients of determination, the effect size (f^2), and the predictive relevance (Q^2). The final section analyzes the interaction (Trust x Distrust) term.

PLS path model assessment.

PLS-SEM usually converges in a small number of iterations. This model analysis converged on a solution in the third iteration. PLS path model estimation requires a check of the outer loadings of the reflective latent variable indicators to verify all are above the minimum of 0.708 (Hair et al., 2017). After the initial run of the PLS algorithm, one

Table 25 Construct Reliability and Validity

Construct Reliability and Validity			
Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Benevolence	0.920	0.938	0.716
Competence	0.859	0.906	0.707
Deceit	0.942	0.956	0.815
Incompetence	0.925	0.947	0.817
Integrity	0.925	0.947	0.816
Malevolence	0.903	0.929	0.723
WTT	0.862	0.914	0.781

indicator, COM9, with a loading of 0.410, fell below the minimum of 0.708. COM9, which is one of the competence statements (Q28), “I totally depend upon THEIR knowledge and skills.” was removed from the model and the PLS algorithm was run again. All outer loadings were then above the minimum of 0.708. Interestingly, Hair et al. (2017), citing Hulland (1999), warn “researchers frequently obtain weaker outer loadings (<0.70) in social sciences, especially when newly developed scales are used” (p 113). In light of this, the outer loadings of this newly developed scale are acceptable.

Measurement Model Evaluation

PLS-SEM measurement model evaluation verifies the results of reflective construct measures for internal consistency, convergent validity, and discriminant validity. Internal consistency has traditionally been measured by Cronbach’s alpha with composite reliability recently becoming the preferred measure (Hair et al., 2017). This research provides both measures as shown in Table 26.

Convergent validity. Since the constructs in the model are all reflective constructs, convergent validity was measured by indicator reliability and average variance extracted (AVE). The indicator reliability loading of all indicator variables are above 0.708, as shown in the Loadings column of Table 26, and therefore, the communalities for all indicator variables are above 0.50, as shown in the Communality column of Table 26, denoting convergent validity.

Discriminant validity.

Discriminant validity has traditionally been measured by cross loadings and the Fornell-Larcker criterion. Recently, Heterotrait-Monotrait (HTMT), the difference of between-trait correlations and within-trait correlations, has been recommended to measure discriminant validity (Hair et al., 2017). This study analyzed all three measures of discriminant validity. First, discriminant validity is indicated by the separateness of the variables wherein the outer loadings all indicator variables are greater than any cross-loadings, as shown in Table 27. According to the Fornell-Larcker criterion (Fornell and Larcker, 1981), discriminant validity is demonstrated because the square root of the average variances extracted is larger than the correlations for each construct, as shown in Table 28. All HTMT correlation statistics were below the threshold of 0.85, as shown in Table 30, meaning this test has established the constructs do have discriminant validity as well (Hair et al., 2017). Additionally, none of the HTMT 95% bias-corrected and accelerated confidence intervals included 1 in the interval (Hair et al., 2017).

Table 26 Results Summary for Reflective Measurements

Results Summary for Reflective Measurements							
Latent Variables	Indicators	Convergent Validity			Internal Consistency Reliability		Discriminant Validity
		Loadings >0.708	Communality >0.5	AVE >0.5	Composite Reliability 0.6-0.9	Cronbach's Alpha 0.6-0.9	
Benevolence	BEN1	0.842	0.709	0.716	0.938	0.920	TRUE
	BEN2	0.879	0.773				
	BEN3	0.850	0.723				
	BEN4	0.866	0.750				
	BEN5	0.880	0.774				
	BEN6	0.754	0.568				
Competence	COM1	0.872	0.761	0.707	0.906	0.859	TRUE
	COM3	0.860	0.739				
	COM6	0.908	0.825				
	COM7	0.710	0.504				
Integrity	INT1	0.864	0.746	0.816	0.947	0.925	TRUE
	INT2	0.916	0.840				
	INT3	0.906	0.822				
	INT4	0.926	0.858				
Malevolence	MAL1	0.768	0.589	0.723	0.929	0.903	TRUE
	MAL2	0.914	0.835				
	MAL3	0.866	0.750				
	MAL4	0.889	0.790				
	MAL5	0.808	0.653				
Incompetence	INC1	0.891	0.793	0.817	0.947	0.925	TRUE
	INC2	0.930	0.865				
	INC3	0.953	0.908				
	INC4	0.839	0.704				
Deceit	DEC2	0.920	0.847	0.815	0.956	0.942	TRUE
	DEC3	0.932	0.868				
	DEC4	0.942	0.887				
	DEC5	0.805	0.647				
	DEC6	0.909	0.826				
WTT	WTT1	0.908	0.825	0.781	0.914	0.862	TRUE
	WTT2	0.794	0.631				
	WTT3	0.942	0.887				

Table 27 Cross Loadings

Cross Loadings							
	Benev- olence	Comp- etence	Integrity	Malev- olence	Incomp- etence	Deceit	WTT
BEN1	0.842	0.439	0.615	-0.193	-0.280	-0.360	0.250
BEN2	0.879	0.587	0.698	-0.296	-0.378	-0.464	0.398
BEN3	0.850	0.608	0.648	-0.346	-0.377	-0.417	0.350
BEN4	0.866	0.497	0.589	-0.353	-0.262	-0.371	0.392
BEN5	0.880	0.587	0.628	-0.375	-0.395	-0.413	0.552
BEN6	0.754	0.427	0.445	-0.097	-0.282	-0.257	0.385
COM1	0.565	0.872	0.600	-0.357	-0.424	-0.437	0.511
COM3	0.453	0.860	0.537	-0.377	-0.527	-0.381	0.579
COM6	0.519	0.908	0.589	-0.351	-0.374	-0.388	0.566
COM7	0.603	0.710	0.601	-0.333	-0.400	-0.348	0.358
INT1	0.591	0.511	0.864	-0.352	-0.285	-0.468	0.328
INT2	0.640	0.629	0.916	-0.465	-0.441	-0.515	0.378
INT3	0.682	0.696	0.906	-0.431	-0.489	-0.511	0.411
INT4	0.681	0.632	0.926	-0.411	-0.416	-0.520	0.333
MAL1	-0.313	-0.388	-0.464	0.768	0.414	0.517	-0.396
MAL2	-0.280	-0.404	-0.379	0.914	0.447	0.524	-0.463
MAL3	-0.246	-0.294	-0.359	0.866	0.435	0.494	-0.392
MAL4	-0.346	-0.409	-0.395	0.889	0.472	0.528	-0.483
MAL5	-0.241	-0.278	-0.375	0.808	0.428	0.538	-0.334
INC1	-0.410	-0.478	-0.405	0.423	0.891	0.553	-0.533
INC2	-0.385	-0.456	-0.444	0.528	0.930	0.629	-0.562
INC3	-0.355	-0.499	-0.428	0.487	0.953	0.624	-0.557
INC4	-0.269	-0.415	-0.371	0.425	0.839	0.558	-0.391
DEC2	-0.443	-0.432	-0.534	0.578	0.587	0.920	-0.447
DEC3	-0.409	-0.394	-0.527	0.548	0.599	0.932	-0.430
DEC4	-0.479	-0.492	-0.591	0.550	0.616	0.942	-0.497
DEC5	-0.329	-0.395	-0.384	0.533	0.528	0.805	-0.369
DEC6	-0.388	-0.374	-0.470	0.556	0.618	0.909	-0.542
WTT1	0.449	0.543	0.365	-0.488	-0.589	-0.530	0.908
WTT2	0.279	0.475	0.238	-0.200	-0.300	-0.210	0.794
WTT3	0.469	0.581	0.433	-0.537	-0.561	-0.533	0.942

Table 28 Fornell-Larcker Criterion for Discriminant Validity

Fornell-Larcker Criterion for Discriminant Validity										
	1	2	3	4	5	6	7	8	9	10
1. Benevolence	0.85									
2. Competence	0.63	0.84								
3. Deceit	- 0.46	- 0.46	0.90							
4. Distrust	- 0.51	- 0.54	0.80	1						
5. Incompetence	- 0.40	- 0.51	0.66	0.76	0.90					
6. Integrity	0.72	0.69	- 0.56	- 0.46	- 0.46	0.90				
7. Malevolence	- 0.34	- 0.42	0.61	0.52	0.52	- 0.46	0.85			
8. Moderating Effect 1	- 0.29	- 0.39	0.54	0.74	0.59	- 0.23	0.22	1		
9. Trust	0.64	0.74	- 0.68	- 0.76	- 0.68	0.63	- 0.54	- 0.65	1	
10. WTT	0.47	0.61	- 0.51	- 0.71	- 0.57	0.40	- 0.49	- 0.57	0.6 9	0.88

Note: correlations are shown in the off diagonals and the square root of the average variances extracted are shown in the diagonals in bold

Table 29 Heterotrait-Monotrait Ratio (HTMT)

Heterotrait-Monotrait Ratio (HTMT)									
	Benev- olence	2	3	4	5	6	7	8	9
Competence (2)	0.708								
Deceit (3)	0.481	0.515							
Distrust (4)	0.527	0.578	0.822						
Incompetence (5)	0.418	0.576	0.700	0.782					
Integrity (6)	0.772	0.774	0.595	0.474	0.487				
Malevolence (7)	0.356	0.476	0.666	0.541	0.563	0.504			
Moderating Effect (8)	0.297	0.418	0.550	0.739	0.612	0.239	0.222		
Trust (9)	0.653	0.800	0.696	0.763	0.705	0.652	0.563	0.649	
WTT	0.498	0.694	0.528	0.740	0.605	0.435	0.518	0.602	0.723

Evaluation of the Structural Model

Structural model evaluation began after the reliability and validity of the construct measures were confirmed. Because PLS-SEM does not initially provide t values or p values, as it is a distribution free technique, a bootstrapping procedure is used where resampling with replacement to select samples and build a distribution. Bootstrapping needs a sufficient number of samples to derive a distribution. From the derived distribution, t values are estimated and from there, p values. The recommended SmartPLS settings are 5,000 subsamples and no sign change (Hair et al., 2017). The sign change option is related to the previously discussed option to assign initial weights of +1

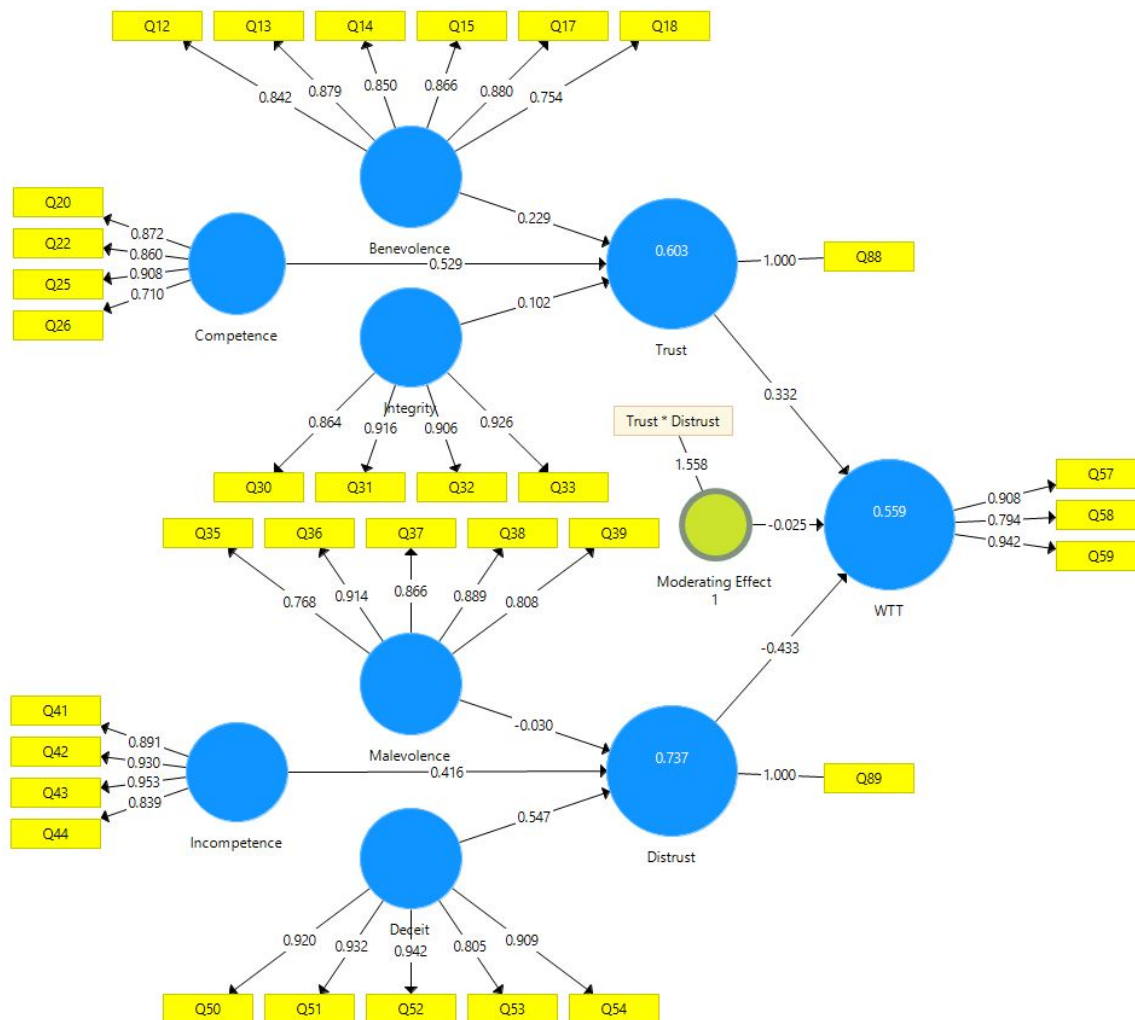


Figure 6 Results Summary- PLS Algorithm Structural Model

or -1. SmartPLS has three choices: no sign change, construct level changes, or individual changes. The construct level changes option gives SmartPLS the ability to change all signs only if more than half the signs need changing to match the original sample. The individual changes option gives SmartPLS the ability to change signs as needed to match the original sample. With no sign changes, the default and recommended option (Hair et al., 2017), all measurement signs are left unmodified during the bootstrapping process.

Structural model path coefficients.

Structural model relationships are represented by path coefficients which are standardized values between +1 and -1. As shown in Table 30, six of the nine model relationships were significant at the $p < 0.05$ level.

Viewed separately, distrust and trust have statistically significant path coefficients, at $p = 0.003$ and $p = 0.011$, respectively.

Taken together, trust and distrust explain 55.9% of the variance of willingness to transact (WTT) ($R^2 = 0.559$). As expected, trust had a positive path coefficient (0.332), while distrust had a negative path coefficient (-0.433). Distrust had a stronger effect on WTT than trust, although both path coefficients were significant.

Table 30 Significance Test Results of the Structural Model Path Coefficients

Significance Test Results of the Structural Model Path Coefficients						
	Path Coefficient	t Value	p Value	95% Confidence Interval		f ²
Benevolence -> Trust	0.229	2.223	0.026**	0.037	0.445	0.059+
Competence -> Trust	0.529	4.928	0.000***	0.303	0.722	0.345++
Integrity -> Trust	0.102	0.815	0.415	-0.124	0.370	0.010
Malevolence -> Distrust	-0.030	0.413	0.680	-0.161	0.131	0.002
Incompetence -> Distrust	0.416	2.812	0.005***	0.168	0.715	0.362+++
Deceit -> Distrust	0.547	4.182	0.000***	0.275	0.773	0.534+++
Trust -> WTT	0.332	2.538	0.011**	0.085	0.605	0.100+
Distrust -> WTT	-0.433	3.018	0.003***	-0.725	-0.160	0.134+
Moderating Effect 1 -> WTT	-0.025	0.281	0.779	-0.185	0.152	0.001
*p<0.10 **p<0.05 ***p<0.01 f ² effect size: f ² <0.02 none, f ² >0.02=small +, f ² >0.15=medium ++, f ² >0.35=large +++						

Next, the path coefficients for the trust subconstructs, competence, benevolence, and integrity, were analyzed. Of the three, competence and benevolence had statistically significant path coefficients, at $p<0.001$ and $p<0.01$, respectively, while integrity (0.102) had a statistically insignificant effect ($p=0.415$) on trust. Competence (0.529) had a stronger effect on trust than benevolence (0.229), although both path coefficients were significant.

Then the path coefficients for the distrust subconstructs, incompetence, deceit, and malevolence, were analyzed. Incompetence and deceit had statistically significant path coefficients, at $p<0.001$ and $p<0.005$, respectively, while malevolence (-0.030) had a

statistically insignificant effect ($p=0.680$) on Distrust. Deceit (0.547) had a stronger effect on Distrust than Incompetence (0.416), although both path coefficients were significant and positive.

Coefficients of determination (R^2).

The coefficients of determination (R^2) are a measure of a model's predictive power (Hair et al., 2017). As shown in Table 31, the coefficients of determination (R^2) for the three endogenous constructs in this model all fall in the moderate range ($0.75 > R^2 > 0.50$) indicating an overall moderate predictive power of the model (Hair 2017). As verification, all three adjusted R^2 also fall in the moderate range.

Effect sizes (f^2).

Another measure of the impact of each construct is the f^2 statistic. The f^2 statistic is calculated as the change in R^2 when the construct in question is deleted from the model. Two PLS path model calculations are performed for each construct with the difference in R^2 noted. As shown in Table 30, three constructs showed no effect, three showed a small effect size (distrust, trust, and benevolence with $f^2 < 0.150$), one showed a medium effect size (incompetence with $f^2 = 0.364$), and one showed a large effect size (deceit with $f^2 = 0.534$).

Table 31 Coefficients of Determination and Predictive Relevance

Coefficients of Determination (R^2)					Predictive Relevance
	R^2	P Values	R^2 Adjusted	P Values	Q^2
Distrust	0.737	0.000	0.729	0.000	0.543
Trust	0.603	0.000	0.590	0.000	0.660
WTT	0.559	0.000	0.546	0.000	0.379

Predictive relevance (Q^2).

To calculate the predictive power (Q^2) of the model's endogenous constructs, an analysis was performed using blindfolding (page 202). Blindfolding deleted every Dth datapoint then used the rest of the model to calculate the missing data. Values for Q^2 above zero indicate their predictive power. Because the sample size (102) divided by D (7) is not an integer, the blindfolding analysis can proceed with an omission distance of 7. All endogenous constructs have a Q^2 greater than zero, as shown in Table 31. This supports the model's predictive relevance for most of the constructs (Hair et al., 2017).

Interaction term analysis.

The interaction between trust and distrust was modeled in SmartPLS as a moderation term. The settings were willingness to transact (WTT) as the dependent variable, Trust as the independent variable, and Distrust as the moderator variable. The moderation calculation method has three choices in SmartPLS: product indicator, two stage, and orthogonalization. Product indicator uses all possible pair combinations of the indicators of the latent constructs to serve as indicators for the interaction term. Product indicator was not a good fit for this model because the interaction is between two higher-order constructs. With product indicator, the moderation term would only consist of the

product of only the one direct indicator each. Two-stage uses the scores of the latent variables as the indicators of the moderation term. With higher-order constructs as the moderation variables, this was the best option. Two-stage is also the default option in SmartPLS. Orthogonalization uses residuals from regressing all possible indicator pairs. Again, this is not a good option when higher-order constructs are the variables of the moderation variable.

The path coefficient of the interaction term, Moderating Effect 1, on WTT was 0.779, as shown in Table 30. The moderation term is not significant at any level. A plot of the slope of the interaction term, as shown in Figure 7, shows three nearly parallel lines. This visually confirms there is little, if any, interaction between trust and distrust.

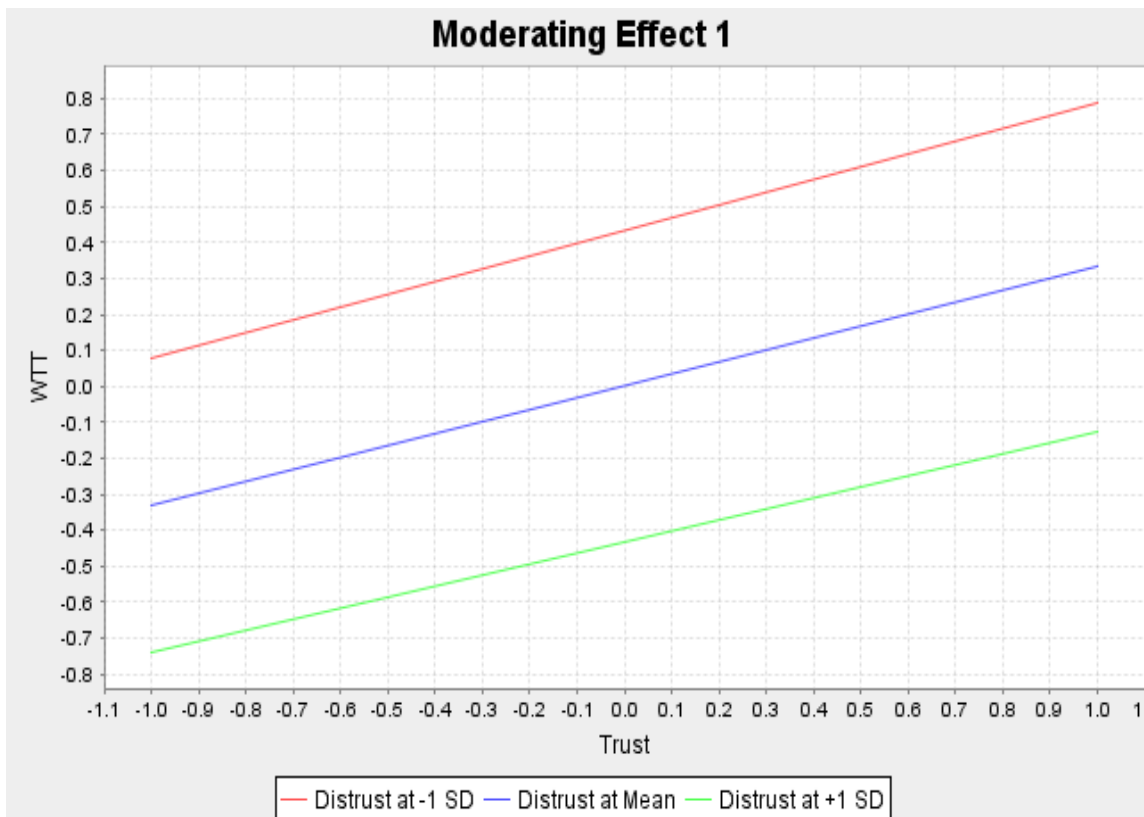


Figure 7 Simple Slope Plot for Mediating Effect 1

Quadrant Testing

Lewicki et al. (1998) proposed theoretical differences between people falling into quadrants representing combinations of high/low trust/distrust. Thus, a test of differences in willingness to transact, based on group membership, was undertaken. This required a split of the responses into the four quadrant categories: low trust and low distrust, high trust and low distrust, low trust and high distrust, and high trust and high distrust. This was accomplished using the “K-Means Clustering” option in SPSS 25.

K-means clustering to determine groups.

The first step was to use k-means clustering to divide the responses into low trust and high trust. The clustering calculations were based on the trust variables from the

PLS-SEM solution, as shown in the first two columns of Table 32. The process converged in four iterations when the change in distance fell below 0.000. The solution yielded 77 cases with high trust and 35 cases with low trust as shown in Table 33.

The second step used k-means clustering to divide the responses into low distrust and high distrust. The clustering calculations were based on the distrust variables from the PLS-SEM solution, as shown in the last two columns of Table 32. The process converged in five iterations when the change in distance fell below 0.000. The solution yielded 22 cases with high distrust and 90 cases with low distrust as shown in Table 33.

The third step was to determine which cases fell into which quadrants. SPSS formulas, as shown in Table 36, were created to transform trust group membership and distrust group membership into quadrant membership. New variables were created with quadrant numbering consistent with Lewicki et al. (1998). The count of each quadrant is shown in Table 37.

Table 32 K-Means Clustering Input Variables

K-Means Clustering Input Variables			
Trust		Distrust	
BEN1	Q12	MAL1	Q35
BEN2	Q13	MAL2	Q36
BEN3	Q14	MAL3	Q37
BEN4	Q15	MAL4	Q38
BEN6	Q17	MAL5	Q39
BEN7	Q18	INC1	Q41
COM1	Q20	INC2	Q42
COM3	Q22	INC3	Q43
COM6	Q25	INC4	Q44
COM7	Q26	DEC2	Q50
INT1	Q30	DEC3	Q51
INT2	Q31	DEC4	Q52
INT3	Q32	DEC5	Q53
INT4	Q33	DEC6	Q54
Trust_overall	Q88	Distrust_overall	Q89

Table 33 K-Means Clustering Results

Trust		Cases
Cluster 1	Low	32
Cluster 2	High	70
Distrust		Cases
Cluster 1	High	23
Cluster 2	Low	79

These quadrant group memberships were defined in SmartPLS based on the variables created in SPSS. A new PLS analysis was run to generate overall and group specific output. The PLS algorithm completed for the overall, Quadrant 1, Quadrant 2, and Quadrant 3 groups but failed on Quadrant 4. The Quadrant 4 analysis failed because the sample size of five was below the minimum of seven cases based on the number of independent variables +1 for degrees of freedom.

Table 34 ANOVA results of K-means cluster analysis by trust items

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
BEN1	44.187	1	.812	100	54.446	.000
BEN2	44.759	1	.566	100	79.062	.000
BEN3	68.271	1	.858	100	79.553	.000
BEN4	87.239	1	.720	100	121.138	.000
BEN5	90.516	1	.596	100	151.941	.000
BEN6	87.353	1	.741	100	117.874	.000
BEN7	83.798	1	2.080	100	40.284	.000
COM1	38.409	1	.563	100	68.165	.000
COM2	37.077	1	1.270	100	29.194	.000
COM3	40.281	1	.867	100	46.440	.000
COM4	13.925	1	.639	100	21.795	.000
COM5	43.106	1	.884	100	48.787	.000
COM6	29.337	1	.636	100	46.146	.000
COM7	34.006	1	.858	100	39.617	.000
COM8	31.227	1	.874	100	35.709	.000
COM9	70.656	1	2.289	100	30.865	.000
INT1	30.749	1	.900	100	34.182	.000
INT2	39.506	1	.626	100	63.137	.000
INT3	49.158	1	.789	100	62.280	.000
INT4	48.159	1	.762	100	63.239	.000
Trust_overall	59.075	1	.757	100	78.018	.000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Table 35 ANOVA results of K-means cluster analysis by distrust items

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
MAL1	13.988	1	.553	100	25.292	.000
MAL2	20.277	1	.650	100	31.187	.000
MAL3	25.948	1	1.119	100	23.188	.000
MAL4	24.818	1	.804	100	30.883	.000
MAL5	27.468	1	1.166	100	23.556	.000
INC1	65.342	1	1.290	100	50.664	.000
INC2	78.480	1	1.077	100	72.878	.000
INC3	59.397	1	.771	100	77.017	.000
INC4	53.189	1	1.010	100	52.653	.000
INC5	90.102	1	.741	100	121.588	.000
INC6	63.660	1	.843	100	75.516	.000
INC7	109.195	1	.915	100	119.363	.000
DEC1	77.467	1	.786	100	98.545	.000
DEC2	61.061	1	.650	100	93.916	.000
DEC3	63.581	1	.672	100	94.554	.000
DEC4	106.760	1	.732	100	145.845	.000
DEC5	50.709	1	1.013	100	50.063	.000
DEC6	68.277	1	.711	100	96.035	.000
Distrust_overall	93.061	1	.897	100	103.753	.000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Table 36 SPSS Quadrant Group Formulas

SPSS Quadrant Group Formulas	
Quadrant	SPSS Formula
Quad1	ANY(kmeans_trust,1)*ANY(kmeans_distrust,2)
Quad2	ANY(kmeans_trust,2)*ANY(kmeans_distrust,2)
Quad3	ANY(kmeans_trust,1)*ANY(kmeans_distrust,1)
Quad4	ANY(kmeans_trust,1)*ANY(kmeans_distrust,2)

Table 37 Quadrant Counts and Percentages

Quadrant Counts and Percentages		
High Trust 70 69%	Q2 Reliance 65 64%	Q4 Confliction 5 5%
Low Trust 32 31%	Q1 Indifference 14 14%	Q3 Wariness 18 18%
	Low Distrust 79 77%	High Distrust 23 23%

Group differences.

Prior to analyzing differences in the groups, the data was tested for normality. The normality test of the data revealed the data was not normally distributed. In fact, a majority of the variables under consideration had a skewness outside the range of -1 to 1 and almost half had a Kurtosis outside the range of -1 to 1. Because the data was not normally distributed, group differences were examined through PLS multigroup analysis

(PLS-MGA) instead of Analysis of Variance (ANOVA), which has more stringent normality requirements than PLS-MGA. With MGA, bootstrapping is used to build a normal distribution from the data in order to calculate significance. Due to the small sample size of the groups and the collinearity of the trust and distrust subconstructs, the bootstrapping failed during the recommended 5,000 sample generation with a singular matrix problem. SmartPLS documentation explained that one variable may have exhibited no variance. It suggested that the problem could be resolved by increasing sample size or removing items with high collinearity. After removing the three items with the highest collinearity, the PLS-MGA analysis completed with results.

Due to the division of the sample into four subgroups representing each of the quadrants, the number of group members was insufficient to compare each group to each other group; instead, each group was compared to the other three groups combined. PLS-SEM was run using the members of Quadrant 1, Indifference, as the members of group A, and the members of the other three quadrants as the members of group B. The path coefficient results are listed in column 3 of Table 38. When PLS-MGA was run to calculate significance levels, the analysis failed with a singular matrix problem; thus, the study was unable to determine if there were or were not significant differences between Quadrant 1 and the other three quadrants combined.

PLS-SEM was run a second time using the members of Quadrant 2, Reliance, as the members of group A, and the members of the other three quadrants as the members of group B. The path coefficient results are listed in column 4 of Table 38. PLS-MGA was run to calculate significance levels. None of the paths were found significant, indicating no differences between Quadrant 2 and the other three quadrants combined.

PLS-SEM was run a third time using the members of Quadrant 3, Wariness, as the members of group A, and the members of the other three quadrants as the members of group B. The path coefficient results are listed in column 5 of Table 38. When PLS-MGA was run to calculate significance levels, the analysis failed with a singular matrix problem; thus, this study was unable to determine if there were differences between Quadrant 3 and the other three quadrants combined.

The group differences testing of the quadrants yielded one significant difference in tests that completed and was unable to determine if there were or were not significant differences in other tests. Whether the different trust and distrust levels represented by quadrant membership produce different results remains undetermined. For the constructs of trust and distrust, these same group difference testing results point to good scalar, factor, and construct invariance for the same reasons. Trust, distrust, and their individual subconstructs measured consistently across the four quadrants providing additional support for the strength of the new instrument.

Table 38 Significance Test Results of the Structural Model Path Coefficients

	Path Coefficient	Quad1	Quad2	Quad3
Benevolence -> Trust	0.229**	-0.679	0.289	0.241
Competence -> Trust	0.529***	0.134	0.491	0.585
Integrity -> Trust	0.102	0.024	0.191	-0.067
Malevolence -> Distrust	-0.03	-0.438	0.175	0.027
Incompetence -> Distrust	0.416***	0.690	0.259	0.584
Deceit -> Distrust	0.547***	0.100	0.394	0.405
Trust -> WTT	0.332**	0.107	0.333	0.250
Distrust -> WTT	-0.433***	-0.756	-0.181	-0.363
Moderating Effect 1 -> WTT	-0.025	-0.026	-0.075	-0.130
significance *p<0.10 **p<0.05 ***p<0.01				

Table 39 Significance Test Results of Quadrant 2 (Reliance) vs all others

PLS-MGA	Path Coefficients-diff (Quad2 - Quads1_3_4)	p-Value (Quad2 vs Quads1_3_4)
Benevolence -> Trust	0.180	0.257
Competence -> Trust	0.122	0.729
Deceit -> Distrust	0.277	0.845
Distrust -> WTT	0.313	0.106
Incompetence -> Distrust	0.219	0.783
Integrity -> Trust	0.333	0.083
Malevolence -> Distrust	0.334	0.063
Moderating Effect 1 -> WTT	0.089	0.678
Trust -> WTT	0.087	0.351

Because Quadrant 4, Confliction, contained only five members, a test could not complete due to an error from PLS-SEM in regard to the sample size for this group; thus, no interpretations could be made when comparing Quadrant 4 to the other three quadrants combined.

Table 40 Path Coefficients and Significance of IT Artifact

PLS-MGA	Path Coefficients-diff (ITA_Laptop - ITA_Smartphone)	p-Value (ITA_Laptop vs ITA_Smartphone)
Benevolence -> Trust	0.055	0.584
Competence -> Trust	0.096	0.329
Deceit -> Distrust	0.545	0.002***
Distrust -> WTT	0.462	0.931
Incompetence -> Distrust	0.179	0.190
Integrity -> Trust	0.054	0.546
Malevolence -> Distrust	0.576	0.992
Moderating Effect 1 -> WTT	0.036	0.451
Trust -> WTT	0.312	0.887
significance *p<0.10 **p<0.05 ***p<0.01		

IT Artifact Analysis

A final analysis was conducted to determine if the IT artifact used to complete the purchase made a difference in trust or distrust and therefore a difference in one of the potential downstream variables, such as willingness to transact. The same PLS-SEM and PLS-MGA analyses as described above were used to calculate the differences between groups. Group identification was determined by the respondent answers to the question asking which IT artifact was used to finalize the e-commerce purchase decision:

Smartphone, Tablet, Netbook, Laptop, or Desktop. The majority of respondents indicated the IT artifact they used was either a laptop (54) or a smartphone (40), as shown in Table 17. The other IT artifacts indicated were desktop (6) and tablet (2). Only two groups met the minimum group size of 7: laptop and smartphone. Because group memberships of desktop and laptop fell below the minimum required sample size of 7 for this model, an

analysis of these groups was not possible; since no respondents selected the netbook option, an analysis of that group was also infeasible.

The PLS-MGA bootstrapping for the difference between path coefficients of laptop responses and smartphone responses completed with one path significantly different. The path for deceit on distrust had a path coefficient difference of 0.545 with a significance of 0.002, as shown in Table 40. Thus, respondents using laptops indicated that deceit was more important to them, as it related to distrust, than their smartphone counterparts. No other significant differences were found between laptop and smartphone IT artifacts.

CHAPTER 5 DISCUSSION AND CONCLUSIONS

The contribution of this study is twofold: 1) provided empirical support for trust and distrust as separate and distinct constructs; and 2) designed an instrument to measure individual trust and individual distrust. Once the instrument was developed and refined through appropriate statistical techniques, this study then used post-hoc analyses to evaluate trust and distrust within the nomological network, using a common downstream variable, to seek better understanding of the effect of quadrant membership on a dependent variable of interest.

Contributions

Research Question 1 asks: How should individual trust and distrust be measured? To answer this question, this study determined first, if the constructs were separate and distinct, and then, how they should be measured. Major contributions included: 1) support that trust and distrust should be measured as separate and distinct constructs; and 2) development of a survey to measure individual trust and distrust. Post-hoc analyses allowed examination of Research Question 2: How do combinations of individual trust and distrust predict downstream variables in the nomological network?

Trust and Distrust as Separate Constructs

Researchers in diverse fields have not yet reached consensus on whether to measure individual trust and distrust as the same construct – that is, does low trust equal high distrust, and vice versa? Lewicki et al. (1998) first proposed that trust and distrust

are separate and distinct constructs. Researchers in the IS field have generally supported that trust and distrust are not easily measured and likely exist separately (Hsiao, 2003; Jarvenpaa and Majchrzak, 2010; Komiak and Benbasat, 2008), although there has been little research on exactly how and in what context individual trust and individual distrust should be measured. In an effort to build upon previous research, this study used a rigorous Q-sorting procedure, where raters placed items into bins measuring the constructs of individual trust and individual distrust. The Q-sorting technique allowed the raters to clearly delineate items as comprising individual trust or individual distrust. Results from the Q-sort indicated that individual trust and distrust are separate constructs, with different underlying subconstructs, and should be measured as distinct variables. Thus, high distrust may not equate to low trust; neither will high trust necessarily equate to low distrust. Results from the Q-sort provided strong evidence to support that trust and distrust should be measured separately, with trust being measured through the subconstructs of competence, integrity, and benevolence, and distrust being measured through the subconstructs of incompetence, deceit, and malevolence. Content, construct, convergent and discriminant validity were assessed through the Q-sort process.

Instrument to Measure Trust and Distrust

The thorough validation of this new instrument to measure trust and distrust included three different discriminant validity tests to support the theory that trust and distrust should be measured separately. This is a major contribution and an important implication for other IS researchers. Discriminant validity was assessed by traditional tests of comparing cross loadings and through the Fornell-Larcker criterion and a more recent test, Heterotrait-Monotrait (HTMT). All three tests demonstrated the constructs do

exhibit discriminant validity. The implications of these results argue that researchers need to measure trust and distrust as separate factors, comprised of the sub-constructs identified.

Once the Q-sort process supported that individual trust and distrust are separate constructs, this study sought to develop an instrument for measuring each as distinctive variables. While previous IS researchers have used the Q-sorting process (Davis, 1985, 1989; Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991; Tan et al., 2013) sometimes called a Q-sort technique (Bhattacharjee, 2002; Segars and Grover, 1998; Storey et al., 2000; Straub et al., 2004), a sorting procedure (Hoehle and Venkatesh, 2015; Moore and Benbasat, 1991; Tan et al., 2013), and a categorization (Davis, 1989), only one prior Q-sorting procedure considered how to evaluate the concept of trust. In that study, Bhattacharjee (2002) developed items to measure trust in the context of willingness to transact in an online environment; however, corresponding items to measure distrust were not included. By completing a rigorous process to examine trust and distrust, this study builds upon and extends previous research. After Q-sorting, exploratory and confirmatory factor analyses were completed to provide content, construct, convergent, and discriminant validity with good results. Then a field test was conducted, reducing the number of survey items to measure trust and distrust and the subconstructs of each, to 20 items. Thus, the current study extends previous work in the field by using a rigorous method to develop a succinct set of items to measure individual trust and distrust as separate and distinct characteristics, adding to the understanding of

Research Question 1:

Research Question 1: How should individual trust and distrust be measured?

Post-hoc Analyses

The first steps of this study, and the major contributions of this research, include: 1) using Q-sort to determine that trust and distrust should be measured separately; and 2) using Q-sort to develop items to measure individual trust and distrust. After completion of those steps, post-hoc analysis was possible, and some interesting findings emerged. While some of the findings are in line with previous research, and others are not, this study recommends using caution when making broad-scale interpretations from one sample and without a priori hypotheses.

High/low levels of trust/distrust – quadrants.

After developing items for individual trust and distrust, this study then completed a field test and explored the relationship of particular combinations of high/low trust and distrust to one downstream variable in the nomological network. This study used willingness to transact as the downstream variable. Evaluation of the model indicated that trust and distrust showed significant path coefficients, in the directions expected, to willingness to transact; the path coefficient for distrust was higher than that of trust, indicating its impact on variables in the downstream network of associations may be higher than the impact of trust. Further statistical analysis revealed no significant interaction effects between trust and distrust, a provocative finding that deserves further study, with well-developed a priori hypotheses in a theoretical model of interest. By completing post-hoc analyses, this study is one of the first to report on the quadrant model of trust and distrust, originally proposed in 1998. With no significant interaction effects, this study suggested that quadrants do not play a role in decisions regarding downstream variables. It should be noted, however, that due to a small sample size,

Quadrant 4 did not meet the minimum number of group members to be tested. Moreover, because of the small number of participants who fell into each of the four quadrants, this study could only compare each quadrant to the other three quadrants combined, rather than comparing each quadrant to every other quadrant separately. Analyses for Quadrants 1 and 3 could not be completed, due to a singularity matrix error; thus, no interpretations regarding differences in those quadrants could be tested. However, this research found no differences between group members in Quadrant 2 and group members in the other three quadrants combined. Thus, the results provide no support for differences between groups, and no interpretations at all, for a majority of the quadrants. However, since few other researchers have evaluated these combinations of high and low levels of trust and distrust, this study makes a contribution to the literature and assists in understanding Research Question 2:

Research Question 2: How do combinations of individual trust and distrust predict downstream variables in the nomological network?

IT artifact.

This study also analyzed IT artifact as a control variable. Only 8 respondents out of the usable sample size of 102 respondents used an IT artifact other than a smartphone or laptop, with about 5% using a desktop and almost 2% using a tablet. In contrast, 94 respondents, or over 92%, used a smartphone or a laptop when they completed or failed to complete the online transaction. While there were insufficient responses to analyze the tablet and desktop groups, this study was able to compare the laptop and smartphone users. Only one variable was statistically significant, with deceit being greater for laptop

users than for those who used a smartphone. Since IT artifact was a control variable in this study with no hypothesized relationships, further study is warranted.

In sum, this research makes several contributions to the literature. Through assessment of discriminant validity in the Q-sorting procedure, this study provides evidence that trust and distrust may be measured separately, an idea that has been discussed at length across diverse fields, with ongoing research presenting differing views. Q-sorting also allowed development of a set of items to measure individual trust and distrust as separate and distinct constructs. Finally, through post-hoc analysis of one variable in the downstream nomological network, the impact of high/low levels of trust/distrust, as proposed by Lewicki et al. (1998), was minimal, while the impacts of individual trust and distrust were significant and in the direction expected. This study provides an impetus for future researchers and recommends that individual trust and distrust be measured separately, using valid and reliable items to assess the constructs of interest. Although this study found no differences between quadrant memberships based on a 2 x 2 matrix of high/low trust/distrust, clearly, additional research beyond this study is needed.

Limitations

This paper has several limitations, although they were minimized as much as possible through conscious mitigation. The limitations included: a small sample size with few respondents per group, in the limited context of individual trust-distrust perceptions with an online vendor; the use of the same data set for EFA, CFA, and path analysis, and the potential for other statistical techniques that may be alternatives for data analysis;

potential non-response bias; common method bias; and some unexpected survey design issues.

Sample Size

First, the sample size was somewhat small, at just over 100 respondents, and was collected in the limited context of willingness to transact with an online vendor. While analyses indicated a statistical power of 0.90 or higher, the problem came when attempting to analyze the quadrants or the groups for the IT artifacts. For each of the four quadrant groups, with the exception of reliance, there were not enough respondents to analyze group differences. Similar problems were observed when evaluating the IT artifact, with most respondents using smartphones or laptops. Future research should collect a larger sample and should ensure that enough respondents fall into each category. Moreover, academic researchers may decide to use scenarios to group respondents into the identified quadrants. In that way, there should be an approximately equal number of respondents for each quadrant. While using scenarios may allow researchers to determine differences between forced groups, they may not represent real-world interactions between customers and organizations. Forcing someone into a group that does not represent how they normally interact may yield inconsistent results, contain knowledge bias if respondents have to simulate using an IT artifact with which they are unfamiliar, or even lead to a large non-response bias due to respondents failing to complete the survey.

Same Data Set for EFA, CFA, and Path Analysis

This research performed exploratory factor analysis, confirmatory factor analysis, and path analysis on the same data set. Future research should gather two large,

independent samples, to increase confidence in the interpretations. From a practical level, completing an exploratory factor analysis, confirmatory factor analysis, and path analysis, even on the same data set, allowed for increased learning for the primary researcher and an ability to complete similar analyses in the future. While development of the items using Q-sort provides a valuable contribution to the literature, it is acknowledged that the confirmatory factor analysis and path analysis should be interpreted with caution. Moreover, other statistical options could have been used for analysis, including non-parametric testing and mean differences.

Types of Trust

This research studied one type of trust: individual trust. The resultant list of items to measure individual trust may not be generalizable to measure different types of trust such as interpersonal trust, group trust, organizational trust, interorganizational trust, or other types of trust.

Potential Non-Response Bias

While the response rates for the Q-sort rounds were at or about 50% or higher, in the field test, only about 14% of solicited participants actually responded to the request to take a survey. While the demographics of the final sample are similar to those of the universities used for the analysis, the potential for non-response bias still exists. Future research should seek higher response rates, and if that goal is not achieved, an analysis of the impact of non-response bias should be undertaken. Moreover, the field test respondents for this study were predominantly young (digital natives), with an average age of about 25 years old. Particularly when the IT artifact used may vary by age,

inclusion of a more diverse age range in future studies may provide beneficial information.

Common Method Bias

Common method bias (CMB) presents a potential problem whenever one method is used to collect data. In particular, the inherent limitations of surveys are well-known. However, this study mitigated, but did not eliminate, CMB in several ways. First, an extensive Q-sort process, with multiple rounds and multiple types of rates, was used to develop items that were valid and reliable. Using valid and reliable items makes the question clear to the respondents and may reduce the effect of CMB. In addition, using more than one kind of response may mitigate the effect of CMB; in this study, statements with Likert scales were used, as well as a yes/no question on whether the purchase was completed and an IT artifact question that asked which type of technology was used in the transaction. With multiple types of questions, it is less likely that respondents will simply go through and mark all as one value (e.g., Strongly Agree), thereby reducing potential CMB effect. Further, CMB argues for the use of multiple methods to reduce impact. The initial items for the survey were developed using a Q-sort process, which has qualitative and quantitative components; after that process, the survey was administered. Thus, multiple methods were used to refine the survey items, rather than relying on a single method, and potentially minimizing CMB. Finally, this research calculated Harman's 1-factor test, which indicated that a single factor was unlikely to explain the variance in all of the items. Overall, this study minimized CMB in the design of the study, the collection of data from two different groups, and through statistical analyses.

Future research should clearly build upon the current study to design with CMB in mind and to use statistical methods to test for CMB while the results are being analyzed.

Survey Design

An interesting outcome of this study was learning that, in this sample, if a survey asks respondents to consider a previous online purchase (whether they made the purchase or not), almost 90% of them reported on a transaction that was completed. Even when the study specifically asked respondents to consider a transaction that was not completed, almost 20% continued to report on a completed transaction. However, as digital natives, because students complete many transactions, they may find it difficult to recall and distinguish a single particular transaction. This could be another reason for error with the student sample. Simulated scenarios may provide an alternative method of surveying respondents, although those scenarios have limitations as well.

Implications and Future Research

This research found that: 1) trust and distrust should be measured separately, and 2) items to measure individual trust and individual distrust may provide future researchers with the ability to apply these items to their research contexts of interest.

Trust and Distrust as Separate and Distinct Constructs

The debate over whether individual trust and distrust are separate and distinct constructs, or opposite ends of a single continuum, has long been debated. This study supports the theory that individual trust and distrust are distinct constructs and should be measured separately. Future research, with a larger and more diverse group of participants, is needed to support or refute this finding. Once the field comes to agreement on whether trust and distrust are distinct constructs, there is significant

potential to move forward with comparisons of trust and distrust in different contexts and across a variety of downstream and upstream variables.

Prior research has not always measured trust and distrust reliably. As mentioned earlier, Dimoka (2010) had conflicting results when an fMRI found trust and distrust activated separate regions of the brain while a survey found no significant difference between trust and distrust. Could this happen because of the items used? A review of the distrust items revealed a possible conflation. The item labeled Discred1 appears intended to measure discredibility although the wording suggests it more accurately measures the low end of the honesty, or credibility, continuum.

Discred1: I feel cautious about characterizing this [Seller] as honest.

Similarly, the item labeled Malev4 appears intended to measure malevolence although the wording suggests it more accurately measures the low end of the benevolence continuum.

Malev4: I am doubtful that this [Seller] would act in my best interests.

Future research may need to reevaluate previous research where trust and distrust were not measured separately or measured separately, but not reliably.

This study has contributed to the field of trust and distrust research by providing a unified set of conceptually based items to measure trust and distrust. The goal of this study was to create and validate a set of reusable items to measure the constructs and subconstructs of trust and distrust. This set of items is the consequence of a rigorous multi-round Q-sort procedure followed by a field test and subsequent analysis. This new

instrument is meant to replace previous measures of trust and distrust that has shown to be fragmented and noncumulative.

Items to Measure Trust and Distrust

Analysis of the subconstructs of individual trust and individual trust presented interesting results. EFA and CFA indicated that the subconstruct of integrity could be dropped from the trust construct, and malevolence could be dropped from distrust. These results suggest that future researchers should take a fresh look at the subconstructs that are important when measuring individual trust and distrust and select a succinct mix with high predictive power. If fewer items can be used to measure the constructs, clearly, researchers should do that. Additionally, if trust and distrust can be measured accurately without the insignificant subconstructs, these could be dropped in future research thus reducing costs and getting similar results. But this is one sample and one study, and future research should evaluate and improve upon the operational definitions proposed herein; much work remains to be done.

Future research should seek a balance of completed and uncompleted transactions. One possibility would involve asking respondents to answer based on their most recent completed and then uncompleted transactions. Since the question set has been reduced to 20 items, fatigue and question overload will be less of a factor. In fact, they would be answering about the same number of questions (40) as the respondents in this study (38). Future research should endeavor to achieve equal numbers of respondents in each quadrant for better quadrant comparison and analyses.

Future researchers may choose to determine what subconstructs are needed to adequately measure individual trust and individual distrust. Clearly, fewer items are

better for researchers and practitioners, as long as the predictive ability is as high or higher with fewer items. However, analysis alone should not form the basis for creating operational definitions. Instead, the information described in this and other studies can be used to develop updated, theoretically-based operational definitions for individual trust and individual distrust, seeking a succinct number of items that represent all of the relevant components necessary to predict how the constructs may predict future actions, downstream in the nomological network.

Future research may want to expand the understanding of trust and distrust by investigating differences between the respondent groups used in this study and enlarging the study to other groups. This area of research would benefit from a better discernment between the e-commerce subgroups of this study: undergraduate IS students, undergraduate business students, IS professionals, and IS academics. These could all be compared to other e-commerce subgroups. Future research could look at differences between various control groups such as age, IT artifact used, and culture.

Post-hoc Analyses

High/low levels of trust/distrust – quadrants.

After determining that individual trust and distrust were positively and negatively related to willingness to transact, respectively, the analysis delved further into how trust and distrust interact. Specifically, do the quadrants proposed by Lewicki and colleagues (1998) predict one of the downstream dependent variables, willingness to transact? In addition to assigning meaningful names to each quadrant, a valuable contribution in itself, this research grouped high/low trust/distrust measures to test the impact of

quadrant membership. Testing these quadrants further added to the understanding of the second research question.

When examining placement into quadrants, a large percentage of the respondents fell in quadrant 2, high trust/low distrust, or reliance. In fact, almost 70% of the respondents had high levels of trust overall, with close to 80% having low distrust. The use of scenarios to force people into quadrants may overcome this limitation. Future researchers may want to consider other analysis techniques such as ANOVA, PLS-MGA, t-test to compare group means, or nonparametric tests.

When combining into specific quadrants, there were not enough responses to conduct comparisons between groups. Even when comparing each quadrant to all other quadrants combined, there were no significant differences between groups. With no statistically significant indicator of differences between quadrants – or no solution found for differences between quadrants – an interesting idea emerges. If researchers have empirically tested Lewicki et al.'s (1998) quadrant model and found no differences or been unable to determine differences, those results may simply not be published, since academic research is biased toward the finding of significant results. Perhaps there are few statistically significant differences between quadrants. In fact, in this study, almost everyone had high levels of trust and low levels of distrust, with most (65%) falling into Quadrant 2. Or perhaps the sample used in this study has unique characteristics. Clearly, more research is warranted before drawing conclusions from the post-hoc analyses.

This research presents a provocative idea: does Lewicki et al.'s (1998) quadrant model predict how customers may behave in an e-commerce environment? While trust and distrust did show statistically significant differences on willingness to transact, and in

the theorized directions, the quadrants showed no differences. Therefore, companies may only have to measure trust and distrust, in the modified instrument presented here, to understand their customers. However, a larger sample size and additional analyses are necessary to understand the statistical and practical significance of the quadrants proposed by Lewicki and colleagues.

Movement between quadrants, whether through action or reaction, was beyond the scope of this study. Future research may want to consider movement between quadrants as it might be interesting to practitioners and academics to better understand and predict quadrant membership and how to recruit customers to desired quadrants.

Characteristics of field study participants.

An interesting outcome of this study was learning that if a survey asks respondents to consider a previous online transaction (whether they made the purchase or not), almost 90% of them reported on a transaction that was completed. Even when the study specifically asked respondents to consider a transaction that was not completed, almost 20% reported on a completed transaction. Future researchers may consider scenarios to maximize the numbers of respondents who are placed within a quadrant.

For the field test, the sample in this study included a large percentage of respondents who identified as White, few of Hispanic or Latino ethnicity, more females than males, and a mostly younger (average age of about 25 years old) group of respondents. While these demographics represent the composition of the students at U1 and U2, more diverse samples are needed to fully analyze how different people trust and distrust. How would an older population respond to the items developed for trust and distrust? Would an older group have different trust/distrust perceptions of variables in the

nomological network? Are there differences between how men and women fall into each of the four quadrants? Do men and women have different levels of trust in an online environment? Similarly, are trust/distrust perceptions different for those who identify as a non-White race? Or do those of Hispanic or Latino descent have differing perceptions of trust/distrust? These questions are thought-provoking and may be relevant in contexts in which this information may provide recommendations on how organizations can reach and retain targeted customers. Understanding trust/distrust perceptions of a diverse group may have practical implications, in terms of how companies may design their websites and social media presence, as well as academic implications, in terms of how trust and distrust are conceptualized.

IT artifact.

The respondents in the field test conducted included very few who used desktops or tablets. With tablets beginning to compete with PC-like features, it is recommended that researchers carefully consider how to ask about the IT artifact used. One suggestion is to create one category for mobile technology (non-smartphone), to include laptops, netbooks, notebooks, Kindles, iPads, tablets, etc.; a second category to include smartphones, and a third to include desktops. To compare across groups, a larger sample must be collected, participants must be chosen based on their likelihood to use a particular type of device, and/or scenarios used to simulate working within the desired IT artifact environment. In addition, since a large percentage of previous studies have analyzed user perceptions with the desktop or laptop as the IT artifact, researchers should carefully consider how to include technology used in the studies they complete. If interpretations are based on studies that looked at desktop computing use, they may be

outdated and need to be re-modeled in light of the shift to smartphones and other mobile devices. Since technology changes rapidly, researchers in the IS field must adjust their expectations and the settings of their studies, accordingly. In addition, the current study did not allow respondents to select more than one IT artifact; thus, if someone began a purchase on their smartphone, went home on their laptop to research further, and finally ordered on their desktop PC, those nuances are not captured; future researchers may want to explore this avenue of research.

Completed transaction bias.

Respondents overwhelmingly indicated, when given a choice, that their last online transaction was completed. Future studies should consider asking half of the respondents to consider their last completed transaction, while the other half should consider their last non-completed transaction. In this way, the groups will be more evenly distributed.

Conclusions

There were two major contribution of this study: 1) used Q-sort to support that individual trust and distrust are separate and distinct constructs; and 2) developed and tested a set of theoretically based items for individual trust and distrust, with construct, content, convergent, and discriminant validity. These two contributions, taken together, answer Research Question 1:

Research Question 1: How should individual trust and distrust be measured?

This paper provides strong support that individual trust and individual distrust are separate and distinct constructs that may be measured through examination of the subconstructs that comprise them. However, exploratory and confirmatory factor analysis

did not indicate that all subconstructs for trust and distrust were similarly important. For trust, benevolence and competence were significant, while integrity was not. Similarly, for distrust, incompetence and deceit were significant, while malevolence was not. These results indicate that the constructs of individual trust and distrust should be reevaluated to see if all of the subconstructs are necessary to measure the variable of interest. Clearly, researchers would prefer shorter surveys and fewer items, but these results should be interpreted with caution. EFA and CFA were performed on the same sample, and there is always the potential that the respondents in this study are not representative of the population as a whole. Researchers should thus interpret these results with caution and proceed with additional studies for support or lack of support for the results found here.

In addition, post-hoc analyses evaluated the impact of these constructs in a downstream variable of interest, willingness to transact, based on quadrant membership, as described by Lewicki et al. (1998), and IT artifact, and contributed to answering Research Question 2:

Research Question 2: How do combinations of individual trust and distrust predict downstream variables in the nomological network?

This research is the first to use Q-sort to develop a set of theoretically based items for individual trust and distrust, as separate and distinct variables of interest. In addition, this study tested the quadrant placement theoretical model developed by Lewicki and colleagues (1998). The model is often referenced but rarely tested. Contrary to theory, this research showed no significant differences in willingness to transact between the quadrant groups. However, with a small sample size and the lack of a priori hypotheses on how quadrant membership affects the dependent variable, the results should be

interpreted with caution. Future research should analyze this complex situation and lead to useful tests of the importance – or lack thereof – of the quadrants.

This research serves as an impetus to move the field forward. The rigorous method of using Q-sort to develop the items, followed by a field test, adds to the nomological network of trust and distrust by helping explain the interrelationships between these two separate constructs, as well as the subcomponents comprising each construct, and a downstream variable, willingness to transact. For practitioners, the study offers development of a valid, reliable, and short survey on individual trust and distrust that may predict observable downstream variables of interest. For academics, the research developed a valid and reliable test for the separate constructs of individual trust and distrust. Testing these items across multiple contexts and within the larger nomological network of trust and distrust that includes more variables of interest, may lead to significant opportunities for future research.

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APPENDICES

APPENDIX A: INSTRUCTIONS FOR Q-SORT PARTICIPANTS

This is phase 1 in development of a survey regarding trust and distrust. Your task is to organize the list of randomly sorted items by placing them in the most appropriate category. The headings of the first two columns are benevolence and malevolence, the second two are competence and incompetence, the third two are integrity and deceit. The final column labeled "other" is for items that do not belong in the first six columns. Term definitions: Mouse over each column heading for definitions provided to help guide your selections. For background information, the following instructions will be provided to participants in the next phase:

Think of the primary business involved in your most recent online transaction, whether you made a purchase or not. The following questions relate to the primary party involved in your transaction. Use this specific company in your most recent transaction to answer the following questions.

For instance, if you searched a website called Books.com to check prices on a textbook, then the company you would use in these questions would be Books.com. Similarly, if you looked for shorts on a website called Clothes.com, then the company you would use would be Clothes.com. Whether you ultimately bought a textbook or a pair of shorts or not, you would use the respective companies when you indicate your agreement with the statements given. Consider all of your technology devices when you answer the questions, whether you used a phone, laptop, tablet, desktop, or other technology device.

In the following questions, the word **THEY**, in all capital letters, will be used to represent the primary company involved in your mobile/non-mobile e-commerce transaction. Some questions may also refer to this company of your transaction as **THEM**, **THEIR**, or **THEMSELVES**. These references to the specific company of your transaction will appear in all capital letters.

Please select the best category for each item.

APPENDIX B: INSTRUCTIONS FOR FIELD SURVEY RESPONDENTS

The questions on the next eight pages ask about your most recent e-commerce experience where you decided to not complete the transaction. Perhaps you added an item to your online shopping cart but left it there unpurchased. Maybe you stopped at the point where you were asked for your payment information. You may have even gotten to the final submit button but changed your mind. Please use this uncompleted transaction as the basis for answering the following questions. The following questions relate to your view of the primary business you interacted with for that incomplete transaction. With that specific company in mind, answer the following questions.

For instance, if you searched a website called Books.com to check prices on a textbook, then the company you would use in these questions would be Books.com. Similarly, if you looked for a shirt on a website called Clothes.com, then the company you would use would be Clothes.com. Use the respective company you started to transact with when you indicate your agreement with the statements given. Consider all your technology devices when you answer the questions, whether you used a phone, laptop, tablet, desktop, or other technology device.

In the following questions, the word THEY, in all capital letters, will be used to represent your primary company involved as described above. These references

to the specific company of your transaction will appear in all capital letters. Some questions may also refer to your company as THEM, THEIR, or THEMSELVES.

APPENDIX C: STARTING Q-SORT ITEMS

Table 41 Trust items for Q-Sort

CODE	TRUST ITEMS	SOURCE
TRU01	THEY operate THEIR business in a highly reliable manner.	adapted from Cho (2006)
TRU02	THEY are responsible in conducting THEIR business.	
TRU03	I believe THEY will complete my transaction successfully.	new items based on Lewicki et al. (1998)
TRU04	I have faith in dealing with THEM.	
TRU05	I am confident in conducting transactions with THEM.	
TRU06	I feel assured THEY will complete my transaction successfully.	
TRU07	THEY strive to work for my best interests.	

Table 42 Benevolence items for Q-sort

CODE	BENEVOLENCE ITEMS	SOURCE
BEN01	THEY care about my well-being.	adapted from Dimoka (2010)
BEN02	THEY keep my best interests in mind.	
BEN03	If there is a problem with this transaction, THEY keep my interests first.	
BEN04	THEY are likely to make sacrifices for me, if needed.	
BEN05	I expect THEY have good intentions toward me.	adapted from Gefen (2002)
BEN06	I expect THEIR intentions are caring.	
BEN07	I expect THEY are well meaning.	

Table 43 Competence items for Q-Sort

CODE	COMPETENCE ITEMS	SOURCE
COM01	THEY have the expertise to understand my needs.	adapted from Dimoka (2010)
COM02	THEY have the ability to successfully complete this transaction.	
COM03	THEY will deliver this product according to the posted delivery terms.	
COM04	THEY understand the market THEY work in.	adapted from Gefen (2002)
COM05	THEY are knowledgeable about the products (or services) THEY sell.	
COM06	THEY know how to provide excellent service.	
COM07	THEY are competent in providing the product or service.	adapted from Moody et al. (2015)
COM08	THEY are effective in providing the product or service.	
COM09	THEY perform THEIR role of providing the product or service very well.	

Table 44 Integrity items for Q-sort

CODE	INTEGRITY ITEMS	SOURCE
INT01	THEY are credible.	adapted from Dimoka (2010)
INT02	Promises made by THEM are reliable.	adapted from Gefen (2002)
INT03	THEY keep THEIR promises.	
INT04	THEY are truthful in THEIR dealings.	adapted from Moody et al. (2015)
INT05	THEY are honest.	
INT06	THEY keep THEIR commitments.	
INT07	THEY are sincere.	
INT08	THEY are genuine.	

Table 45 Distrust items for Q-sort

CODE	DISTRUST ITEMS	SOURCE	
DIS01	THEY operate THEIR business in an unreliable way.	adapted from Cho (2006)	
DIS02	THEY conduct business in a deceptive way.		
DIS03	I suspect THEY are only interested in THEIR own well-being.	adapted from McKnight and Choudhury (2006)	
DIS04	I anticipate my relationship with THEM may get worse in the future.		
DIS05	I worry whether THEY are capable.		
DIS06	I feel nervous about how knowledgeable THEY are about the product.		
DIS07	If an important issue arises, I would feel uncomfortable depending on THEM.		
DIS08	I would feel nervous relying on THEM in a tough situation.		
DIS09	Faced with a difficult situation, I worry about using THEM.		
DIS10	If I had a challenging problem, I would be quite hesitant about using THEM again.		
DIS11	I fear THEIR future decisions.		new items based on Lewicki et al. (1998)
DIS12	I am cynical toward them.		
DIS13	THEY must be monitored.		
DIS14	I must remain vigilant when dealing with THEM.		
DIS15	I am wary of THEM.		
DIS16	I must remain watchful of my transactions with THEM.		

Table 46 Malevolence items for Q-sort

CODE	MALEVOLENCE ITEMS	SOURCE
MAL01	I suspect THEY are uninterested in my well-being.	adapted from Dimoka (2010)
MAL02	THEY are likely to engage in a harmful behavior toward me.	
MAL03	I believe THEY will perform this transaction in a fraudulent way.	
MAL04	I am doubtful THEY would act in my best interests.	
MAL05	THEY pretend to care more about me than THEY really do.	adapted from Moody et al. (2015)
MAL06	I fear THEY dislike putting THEMSELVES out to help me.	

Table 47 Incompetence items for Q-sort

CODE	INCOMPETENCE ITEMS	SOURCE
INC01	I am skeptical THEY are competent in sending the product or service on time.	adapted from Dimoka (2010)
INC02	THEIR knowledge level is insufficient.	adapted from Moody et al. (2015)
INC03	I believe THEY do a haphazard job.	
INC04	THEY are incompetent in THEIR area of expertise.	

Table 48 Deceit items for Q-sort

CODE	DECEIT ITEMS	SOURCE
DEC01	I worry THEY are untruthful in THEIR dealings.	adapted from Dimoka (2010)
DEC02	I am uncertain whether THEY will keep THEIR promises.	
DEC03	THEY would tell a lie if THEY could gain by it.	adapted from Moody et al. (2015)
DEC04	THEY don't have high standards of honesty.	
DEC05	THEY would cheat on THEIR financial statements if THEY thought THEY could get away with it.	

Table 49 Quadrant 1: Indifference items for Q-sort

CODE	QUADRANT 1: INDIFFERENCE ITEMS	SOURCE
Q1I01	I am losing faith in THEM.	adapted from Mascarenhas et al. (2006)
Q1I02	THEIR interests are out of alignment with my interests.	
Q1I03	I am distrustful of THEIR intentions regarding my transaction.	
Q1I04	I trust THEM to put my needs above all other considerations when handling my transaction.	
Q1I05	I feel my interactions with THEM are guarded.	
Q1I06	It is risky for me to transact with THEM.	
Q1I07	I avoid THEM whenever possible.	new items based on Lewicki et al. (1998)
Q1I08	I place clearly defined limits on my transactions with THEM.	
Q1I09	My interactions with THEM are strictly business.	
Q1I10	I dealt with THEM only because of outside influences.	

Table 50 Quadrant 2: Reliance items for Q-sort

CODE	QUADRANT 2: RELIANCE ITEMS	SOURCE
Q2T01	I have tremendous faith in THEM.	adapted from Mascarenhas et al. (2006)
Q2T02	I feel very comfortable with THEM.	
Q2T03	I feel very confident about my transactions with THEM.	
Q2T04	I freely share my information with THEM.	
Q2T05	I would gladly recommend THEM to anybody.	
Q2T06	THEIR core values match my personal beliefs.	new items based on Adler (2005)
Q2T07	My transactions with THEM are a great benefit to both of us.	
Q2T08	THEY work to improve the transaction process for both our benefit.	
Q2T09	I pursue new opportunities with THEM.	new items based on Lewicki et al. (1998)
Q2T10	I look for new initiatives from THEM.	

Table 51 Quadrant 3: Wariness items for Q-sort

CODE	QUADRANT 3: WARINESS ITEMS	SOURCE
Q3D01	I feel very uneasy when disclosing vital information about myself to THEM.	adapted from Mascarenhas et al. (2006)
Q3D02	I deeply distrust THEM.	
Q3D03	I have no confidence in THEM.	
Q3D04	I feel THEY may have harmful motives.	
Q3D05	I assume I will suffer in some way from this relationship.	new items based on Adler (2005)
Q3D06	I strictly limit THEIR access to my information.	
Q3D07	I am suspicious of THEM.	
Q3D08	I expect THEY would be dishonest.	new items based on Lewicki et al. (1998)
Q3D09	If I continue dealing with THEM, something bad is bound to happen.	
Q3D10	"The best offense is a good defense" describes my relationship with THEM.	
Q3D11	THEY make me feel paranoid.	

Table 52 Quadrant 4: Confliction items for Q-sort

CODE	QUADRANT 4: CONFLICTION ITEMS	SOURCE
Q4C01	I am very distrustful of what THEY can do for me.	adapted from Mascarenhas et al. (2006)
Q4C02	I am skeptical of THEM.	
Q4C03	I doubt THEIR competence.	
Q4C04	I have every reason for suspecting the quality THEY can deliver.	
Q4C05	I totally depend upon THEIR knowledge and skills.	
Q4C06	I trust THEM.	new items based on Lewicki et al. (1998)
Q4C07	I want to verify any claims THEY make.	
Q4C08	I only deal with THEM for certain products/services.	
Q4C09	I place strict limits on my interactions with THEM.	
Q4C10	I check with THEM first when I need this type of product or service.	

APPENDIX D: FIELD SURVEY ITEMS

Dependent Variable Items

Table 53 Willingness to transact items

CODE	WILLINGNESS TO TRANSACT ITEMS	SOURCE
WTT01	Regarding the transaction used for this survey, did you complete this purchase transaction with THEM?	adapted from Kim et al. (2008)
WTT02	I am likely to recommend THEM to my friends.	
WTT03	I have a history of purchasing from this seller in the past.	
WTT04	I am likely to make a purchase from THEM in the future.	

Control Variable Items

Table 54 Transaction organization item

CODE	TRANSACTION ORGANIZATION ITEM	SOURCE
ORG01	Please enter the name of the company/organization with which you conducted your selected e-commerce transaction. _____	New item

Table 55 Transaction category item

CODE	TRANSACTION CATEGORY ITEM	SOURCE
ITA01	Please enter a description of the product/service your selected e-commerce transaction concerned. A general category will do if you do not want to disclose details. _____	New item

Table 56 Information Technology Artifact

CODE	INFORMATION TECHNOLOGY ARTIFACT ITEM	SOURCE
ITA01	<p>Please select the information technology device type used for your selected e-commerce transaction from this list. If more than one device type was used, select the device type where the transaction was finalized (either the purchase was completed or canceled).</p> <ul style="list-style-type: none"> <input type="radio"/> Smartphone <input type="radio"/> Tablet <input type="radio"/> Netbook <input type="radio"/> Laptop <input type="radio"/> Desktop <input type="radio"/> Other _____ 	New item

Table 57 Monthly e-commerce transactions item

CODE	MONTHLY E-COMMERCE TRANSACTIONS ITEM	SOURCE
MET01	<p>Please select the number of e-commerce transactions you have made in the past month.</p> <ul style="list-style-type: none"> <input type="radio"/> 0 <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <input type="radio"/> 6 <input type="radio"/> 7 <input type="radio"/> 8 <input type="radio"/> 9 <input type="radio"/> 10 or more 	New item

Table 58 Mobile self-efficacy items

CODE	MOBILE COMPUTING SELF-EFFICACY ITEMS	SOURCE
MSE01	I believe I have the ability to make purchases using a mobile device.	adapted from Keith et al. (2015)
MSE02	I believe I have the ability to identify common problems with mobile devices.	
MSE03	I believe I have the ability to correct common problems with mobile devices.	
MSE04	I believe I have the ability to install features to mobile devices.	
MSE05	I believe I have the ability to remove features from mobile devices.	
MSE06	I believe I have the ability to install applications to mobile devices.	
MSE07	I believe I have the ability to remove applications from mobile devices.	
MSE08	I believe I have the ability to use the productivity features offered by mobile devices (e.g. calendar, email, task scheduling, etc.).	

Table 59 E-commerce self-efficacy items

CODE	E-COMMERCE SELF-EFFICACY ITEMS	SOURCE
ESE01	I believe I have the ability to make e-commerce purchases.	adapted from Keith et al. (2015)
ESE02	I believe I have the ability to identify common problems with e-commerce purchases.	
ESE03	I believe I have the ability to correct common problems with e-commerce purchases.	

Table 60 Academic Major Item

ACADEMIC MAJOR ITEM	
MAJOR	What is your academic major?

Table 61 Predisposition to Trust Items

PREDISPOSITION TO TRUST ITEMS		SOURCE
PTT01	I usually trust others until they give me a reason not to trust them.	adapted from McKnight, Choudhury, and Kacmar (2002a)
PTT02	I generally give others the benefit of the doubt at first.	
PTT03	My typical approach is to trust others until they prove I should not trust them.	

Table 62 Age, Education, and Ethnicity items

AGE, EDUCATION, AND ETHNICITY ITEMS	
Age	Please select your year of birth from the following drop-down list.
Sex	Male
(Select one)	Female
Education	What level of education have you completed?
(Select one)	Some high school
	High school or GED equivalent
	Some college (freshman level completed)
	Some college (sophomore level completed)
	Some college (junior level completed)
	College undergraduate degree completed
	Some graduate classes
	Master or graduate degree completed
Ethnicity	What is this person's ethnicity?
	Hispanic or Latino
	Not Hispanic or Latino
Race	What is this person's race? Mark one or more races to indicate what this person considers himself/herself to be.
	White
	Black or African American
	Asian
	American Indian or Alaska Native
	Native Hawaiian or Other Pacific Islander

APPENDIX E: U1 SURVEY (KSU 18-036)

Start of Block: Consent? and >18?

Q1 ONLINE SURVEY CONSENT FORM (Select one)**Study #18-036**

Title of Research Study: Measuring Trust and Distrust: An Operationalization, Instrument Validation, and Empirical Test

Researcher's Contact Information: John-David Rusk, 678-986-2065,
jrusk5@students.kennesaw.edu

Introduction You are being invited to take part in a research study conducted by John-David Rusk of Kennesaw State University. Before you decide to participate in this study,

you should read this form and ask questions about anything that you do not understand.

Description of Project The purpose of the study is to learn more about trust and distrust in an e-commerce transaction.

Explanation of Procedures Participants will be asked to answer questions about a recent e-commerce experience whether a transaction was completed or not completed.

Time Required This activity should take 10 to 15 minutes.

Risks or Discomforts There are no known risks to participation in this study.

Benefits A better understanding of trust and distrust in an e-commerce environment can help researchers conduct more effective research where trust is a component. This research can help practitioners better interact with customers through their websites. This research may help humankind better understand trust and distrust in general.

Confidentiality The results of this participation will be anonymous. Personal identifiers will not be collected. Data will be stored on secure computers and accessible only by the researchers.

Inclusion Criteria for Participation You must be 18 years of age or older to participate in this study.

Use of Online Survey Data collected online will be handled in a anonymous manner, but Internet Protocol addresses WILL NOT be collected by the survey program. Research at Kennesaw State University that involves human participants is carried out under the oversight of an Institutional Review Board. Questions or problems regarding these activities should be addressed to the Institutional Review Board, Kennesaw State University, 585 Cobb Avenue, KH3403, Kennesaw, GA 30144-5591, (470) 578-2268. PLEASE PRINT A COPY OF THIS CONSENT DOCUMENT FOR YOUR RECORDS, OR IF YOU DO NOT HAVE PRINT CAPABILITIES, YOU MAY

CONTACT THE RESEARCHER TO OBTAIN A COPY

- I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.
- I do not agree to participate and will be excluded from the remainder of the questions. (default)
-

Q2 Only participants aged 18 and over may participate in this study. (Select one)

- I am at least 18 years old.
- I am younger than 18 years old. (default)

End of Block: Consent? and >18?

Start of Block: Intro and control items

Q3

This survey asks 66 questions with 3 to 9 questions per page. You will see a progress bar at the top of each screen as you proceed. Please answer all questions to the best of your ability.

Q4 Please select your year of birth from the following drop-down list.

2000

1999

1998

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- 1929
- 1928
- 1927
- 1926
- 1925

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1921

1920

1919

1918



Q5 What is your academic major?

- Accounting
- African and African Diaspora Studies
- Anthropology
- Apparel and Textiles
- Applied Computer Science
- Art
- Art Education
- Art History
- Asian Studies
- Biochemistry
- Biology
- Chemistry
- Civil Engineering
- Communication
- Computational and Applied Mathematics
- Computer Engineering
- Computer Game Design and Development
- Computer Science
- Construction Engineering

- Construction Management
- Criminal Justice
- Culinary Sustainability and Hospitality
- Dance
- Digital Animation
- Early Childhood Education
- Economics
- Electrical Engineering
- Electrical Engineering Technology
- English
- English Education
- Entrepreneurship
- Environmental Engineering
- Environmental Sciences
- Exercise Science
- Finance
- Geographic Information Science
- Geography
- Health and Physical Education

- History
- History Education
- Human Services
- Industrial and Systems Engineering
- Industrial Engineering Technology
- Information Security and Assurance
- Information Systems
- Information Technology
- Integrative Studies
- Interactive Design
- International Affairs
- International Business
- Journalism and Emerging Media
- Management
- Manufacturing Operations
- Marketing
- Mathematics
- Mathematics Education
- Mechanical Engineering

- Mechanical Engineering Technology
- Mechatronics Engineering
- Middle Grades Education
- Modern Language and Culture
- Music
- Music Education
- Music Performance
- Nursing
- Philosophy
- Physics
- Political Science
- Professional Sales
- Psychology
- Public Health Education
- Public Relations
- Sociology
- Software Engineering
- Sport Management
- Supply Chain Logistics

- Surveying and Mapping
- Technical Communication
- Theatre and Performance Studies
- other

End of Block: Intro and control items

Start of Block: Who and what, how, and how many

Q6 The questions on the next eight pages ask about your most recent e-commerce experience. For these questions, think about the last time you looked to buy something online, whether you made the purchase or not. Think about the primary business with which you interacted. The following questions relate to your view of that primary business. With that specific company in mind, answer the following questions. For instance, if you searched a website called Books.com to check prices on a textbook, then the company you would use in these questions would be Books.com. Similarly, if you looked for a shirt on a website called Clothes.com, then the company you would use would be Clothes.com. Whether you ultimately bought a textbook or a shirt or not, you would use the respective companies when you indicate your agreement with the statements given. Consider all your technology devices when you answer the questions, whether you used a phone, laptop, tablet, desktop, or other technology device. In the following questions, the word THEY, in all capital letters, will be used to represent your primary company involved as described above. These references to the specific company of your transaction will appear in all capital letters. Some questions may also refer to your company as THEM, THEIR, or THEMSELVES.

Q7 Please enter the name of the company/organization you selected to answer questions about your e-commerce transaction.

Q8 Please enter a description of the product/service your selected e-commerce transaction concerned. A general category will do if you do not want to disclose details.



Q9 Please select the information technology device type used for your selected e-commerce transaction from this list. If more than one device type was used, select the device type where the transaction was finalized (either the purchase was completed or canceled).

- Smartphone
 - Smartwatch
 - Tablet
 - Netbook
 - Laptop
 - Desktop
 - Digital assistant (Amazon Echo, Google Home, Apple HomePod, etc.)
 - Other: _____
-

Q10 Please select the total number (or best estimate) of e-commerce transactions you have made in the past month.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

End of Block: Who and what, how, and how many

Start of Block: Benevolence

Q11

Because you choose $\${Q7/ChoiceTextEntryValue}$, the questions on the next seven pages will ask you about $\${Q7/ChoiceTextEntryValue}$.

For the questions on this page, consider the **benevolence** of $\${Q7/ChoiceTextEntryValue}$. Benevolence is defined here as the belief in the good intentions and kindness of another toward you.

Q12 I expect THEIR intentions are caring.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q13 I expect THEY are well meaning.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q14 THEY care about me as a customer.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q15 THEY strive to work for my best interests.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q16 THEY make sure my transactions with THEM are a great benefit to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q17 THEY keep my best interests in mind.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q18 THEY are likely to make sacrifices for me, if needed.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Benevolence

Start of Block: Competence

Q19 For the questions on this page, consider the **competence** of `#{Q7/ChoiceTextEntryValue}`. Competence is defined here as the belief in the ability of another to do as they claim they will do.

Q20 THEY are competent in providing the product or service.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q21 THEY are knowledgeable about the products (or services) THEY sell.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q22 I believe THEY can complete my transaction successfully.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q23 THEY understand the market THEY work in.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q24 THEY know how to provide excellent service.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q25 THEY perform THEIR role of providing the product or service very well.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q26 THEY have the expertise to understand my needs.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q27 THEY will deliver this product/service according to the posted delivery terms.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q28 I totally depend upon THEIR knowledge and skills.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Competence

Start of Block: Integrity

Q29 For the questions on this page, consider the **integrity** of $\{Q7/ChoiceTextEntryValue\}$. Integrity is defined here as the belief in the honesty and truthfulness of another.

Q30 THEY are honest.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q31 THEY are truthful in THEIR dealings.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q32 THEY keep THEIR promises.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q33 THEY are genuine.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Integrity

Start of Block: TRUST

Q88 Overall, I trust $\{Q7/ChoiceTextEntryValue\}$.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: TRUST

Start of Block: Malevolence

Q34 For the questions on this page, consider the **malevolence** of $\{Q7/ChoiceTextEntryValue\}$. Malevolence is defined here as the belief in the bad intentions and ill will of another toward you.

Q35 THEIR motive is to cause harm.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q36 If I continue dealing with THEM, THEY will do something detrimental to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q37 I am bothered by THEIR malicious objectives.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q38 THEY are likely to make decisions that are harmful to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q39 THEIR unethical practices are injurious to me.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Malevolence

Start of Block: Incompetence

Q40 For the questions on this page, consider the **incompetence** of [\\${Q7/ChoiceTextEntryValue}](#). Incompetence is defined here as the belief that another is inept to do as they claim they will do.

Q41 I doubt THEIR competence.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q42 I worry THEY are incapable.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q43 I have no confidence in THEIR ability.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q44 THEY are incompetent in THEIR area of expertise.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q45 THEIR processes are unreliable.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q46 I feel nervous about how naive THEY are about the product.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q47 I have every reason to doubt the quality THEY can deliver.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Incompetence

Start of Block: Deceit

Q48 For the questions on this page, consider the **deceit** of $\{Q7/ChoiceTextEntryValue\}$. Deceit is defined here as the belief in the dishonesty and duplicity of another.

Q49 THEY conduct business in a deceptive way.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q50 THEY lie.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q51 THEY are untruthful in THEIR dealings.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q52 I feel THEY may be dishonest.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q53 THEY would cheat on THEIR financial statements.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q54 I believe THEY perform fraudulent transactions.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Deceit

Start of Block: DISTRUST

Q89 Overall, I distrust \${Q7/ChoiceTextEntryValue}.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: DISTRUST

Start of Block: Willingness to transact

Q55 For the questions on this page, consider your perception of
\${Q7/ChoiceTextEntryValue}.

Q56 Regarding the transaction used for this survey, did you complete this purchase
transaction with THEM?

- I completed the transaction.
 - I did not complete the transaction.
-

Q57 I am likely to recommend THEM to my friends.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q58 I have a history of purchasing from this seller in the past.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q59 I am likely to make a purchase from THEM in the future.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Willingness to transact

Start of Block: Trust disposition

Q60 The questions on these last four pages ask about you.

The questions on this page ask about your **disposition to trust**.

Q61 I generally give others the benefit of the doubt at first.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q62 My typical approach is to trust others until they prove I should not trust them.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q63 I usually trust others until they give me a reason not to trust them.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Trust disposition

Start of Block: Mobile self-efficacy

Q64 The questions of this page ask about your **comfort level with mobile technology**.

Q65 I believe I have the ability to remove features from mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q66 I believe I have the ability to install applications to mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q67 I believe I have the ability to remove applications from mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q68 I believe I have the ability to use the productivity features offered by mobile devices (e.g. calendar, email, task scheduling, etc.).

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q69 I believe I have the ability to install features to mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q70 I believe I have the ability to correct common problems with mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q71 I believe I have the ability to identify common problems with mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q72 I believe I have the ability to make purchases using a mobile device.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Mobile self-efficacy

Start of Block: e-commerce self-efficacy

Q73 The questions on this page ask about your **comfort level with e-commerce transactions**.

Q74 I believe I have the ability to make e-commerce purchases.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q75 I believe I have the ability to identify common problems with e-commerce purchases.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q76 I believe I have the ability to correct common problems with e-commerce purchases.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: e-commerce self-efficacy

Start of Block: Demographics and drawing entry

Q77 The questions on this last page ask about your **demographics**. These questions are adapted from United States federal guidelines.

Q78 What is the highest level of education have you completed?

- Some high school
 - High school or GED equivalent
 - Some college (freshman level completed)
 - Some college (sophomore level completed)
 - Some college (junior level completed)
 - College undergraduate degree completed
 - Some graduate classes
 - Master or graduate degree completed
-

Q79 What is your ethnicity?

- Hispanic or Latino
 - Not Hispanic or Latino
-

Q80 What is your race? Mark one or more races to indicate what you consider yourself to be.

- White
 - Black or African American
 - Asian
 - American Indian or Alaska Native
 - Native Hawaiian or Other Pacific Islander
-

Q81 Sex:

- Female
- Male

End of Block: Demographics and drawing entry

Start of Block: Drawing

Q82 Thank you for helping me with my research. To enter an optional and voluntary drawing for an Amazon gift card, please enter your name and email address. One \$25 Amazon gift card will be randomly awarded for every 25 completed responses.

- Yes, I will provide my email address to enter the drawing. Note: this will redirect you to a separate survey where your email address will be collected.
- No, thank you. I decline the offer to enter the drawing.

End of Block: Drawing

APPENDIX F: U2 SURVEY (UNG 2018-004)

Start of Block: Consent? and >18?

Q1 ONLINE SURVEY CONSENT FORM (Select one)

Study #2018-004

Title of the Study: Measuring Trust and Distrust: An Operationalization, Instrument Validation, and Empirical Test

Researcher: John-David Rusk, Mike Cottrell College of Business: Department of Computer Science and Information Systems, jdrusk@ung.edu

Introduction: You are being asked to participate in a research study being conducted by John-David Rusk, a faculty member in the Department of Computer Science and Information Systems at the University of North Georgia.

You have been approached to help identify trust and distrust measures in e-commerce transactions. As someone with e-commerce experience, your input will help identify trust and distrust measurements for e-commerce transactions.

Purpose: The purpose of this project is to determine the best way to measure trust and distrust in an e-commerce transaction. To determine if levels of trust and distrust predict a willingness to transact. To determine if the IT artifact (technology type) used influences trust and distrust perceptions.

Procedures: The survey will take approximately 10-15 minutes. During the interview you will be asked questions about your trust and distrust in a recent e-commerce transaction.

Risks/Benefits: There are no direct benefits to you from participation, but your willingness to share your knowledge and experiences will contribute to There are no direct benefits to you from participation, but your willingness to share your knowledge and experiences will contribute to a better understanding of trust and distrust in the e-commerce environment for both researchers and practitioners.

The risks associated with participation in this study are minimal.

Confidentiality: Your study data will be handled as confidentially as possible. If results of this study are published or presented, individual names and other personally identifiable information will not be used.

To minimize the risks to confidentiality, we will collect data in an anonymous manner. No identifying information will be collected or stored. All data collected will be stored on secure computers and accessible only by the researchers. Three (3) years from the completion of this study, all data will be destroyed.

We will keep your study data as confidential as possible, with the exception of certain information that we must report for legal or ethical reasons, such as child abuse, elder abuse, or intent to hurt yourself or others.

Voluntary Participation: Your participation in this study is voluntary. Even if you decide to participate, you may withdraw from the study without penalty at any time during or after the study. You may have the results of your participation, to the extent that they can be identified, returned to you, removed from the research records or destroyed.

Contacts and Questions: If you have any questions about this research project or interview, feel free to contact John-David Rusk at jdrusk@ung.edu.

Statement of Consent: I agree to participate in this study, and to the use of this study as described above. By clicking “I agree” below, you indicate that you have read the information in this document and have had a chance to ask any questions you have about the study.

Questions or problems regarding your rights as a participant should be addressed to Dr. Lisa Jones-Moore, Chair of the Institutional Review Board, University of North Georgia, Middle Grade Education, 82 College Circle, Dahlonega, GA, (706) 867-2969, IRBchair@ung.edu

- I agree and give my consent to participate in this research project. I understand that participation is voluntary and that I may withdraw my consent at any time without penalty.
- I do not agree to participate and will be excluded from the remainder of the questions. (default)
-

Q2 Only participants aged 18 and over may participate in this study. (Select one)

- I am at least 18 years old.
- I am younger than 18 years old. (default)

End of Block: Consent? and >18?

Start of Block: Intro and control items

Q3

This distrust survey asks 66 questions with 3 to 9 questions per page. You will see a progress bar at the top of each screen as you proceed. Please answer all questions to the best of your ability.

Q4 Please select your year of birth from the following drop-down list.

2000

1999

1998

1997

1996

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1994

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1992

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1984

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1982

- 1981
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- 1929
- 1928
- 1927
- 1926
- 1925

- 1924
 - 1923
 - 1922
 - 1921
 - 1920
 - 1919
 - 1918
-

Q5

What is your academic major?

- Accounting
- African and African Diaspora Studies
- Anthropology
- Apparel and Textiles
- Applied Computer Science
- Art
- Art Education
- Art History
- Asian Studies
- Biochemistry
- Biology
- Chemistry
- Civil Engineering
- Communication
- Computational and Applied Mathematics
- Computer Engineering
- Computer Game Design and Development
- Computer Science

- Construction Engineering
- Construction Management
- Criminal Justice
- Culinary Sustainability and Hospitality
- Dance
- Digital Animation
- Early Childhood Education
- Economics
- Electrical Engineering
- Electrical Engineering Technology
- English
- English Education
- Entrepreneurship
- Environmental Engineering
- Environmental Sciences
- Exercise Science
- Finance
- Geographic Information Science
- Geography

- Health and Physical Education
- History
- History Education
- Human Services
- Industrial and Systems Engineering
- Industrial Engineering Technology
- Information Security and Assurance
- Information Systems
- Information Technology
- Integrative Studies
- Interactive Design
- International Affairs
- International Business
- Journalism and Emerging Media
- Management
- Manufacturing Operations
- Marketing
- Mathematics
- Mathematics Education

- Mechanical Engineering
- Mechanical Engineering Technology
- Mechatronics Engineering
- Middle Grades Education
- Modern Language and Culture
- Music
- Music Education
- Music Performance
- Nursing
- Philosophy
- Physics
- Political Science
- Professional Sales
- Psychology
- Public Health Education
- Public Relations
- Sociology
- Software Engineering
- Sport Management

- Supply Chain Logistics
- Surveying and Mapping
- Technical Communication
- Theatre and Performance Studies
- other

End of Block: Intro and control items

Start of Block: Who and what, how, and how many

Q6 The questions on the next eight pages ask about your most recent e-commerce experience where you decided to not complete the transaction. Perhaps you added an item to your online shopping cart but left it there unpurchased. Maybe you stopped at the point where you were asked for your payment information. You may have even gotten to the final submit button but changed your mind. Please use this uncompleted transaction as the basis for answering the following questions. The following questions relate to your view of the primary business you interacted with for that incomplete transaction. With that specific company in mind, answer the following questions.

For instance, if you searched a website called Books.com to check prices on a textbook, then the company you would use in these questions would be Books.com. Similarly, if you looked for a shirt on a website called Clothes.com, then the company you would use would be Clothes.com. Use the respective company you started to transact with when you indicate your agreement with the statements given. Consider all your technology devices when you answer the questions, whether you used a phone, laptop, tablet, desktop, or other technology device.

In the following questions, the word THEY, in all capital letters, will be used to represent your primary company involved as described above. These references to the specific company of your transaction will appear in all capital letters. Some questions may also refer to your company as THEM, THEIR, or THEMSELVES.

Q7 Please enter the name of the company/organization you selected to answer questions about the e-commerce transaction you did not complete.

Q8 Please enter a description of the product/service of your selected incomplete e-commerce transaction. A general category will do if you do not want to disclose details.



Q9 Please select the information technology device type used for your selected incomplete e-commerce transaction from this list. If more than one device type was used, select the device type where the transaction was finally canceled.

- Smartphone
- Smartwatch
- Tablet
- Netbook
- Laptop
- Desktop
- Digital assistant (Amazon Echo, Google Home, Apple HomePod, etc.)
- Other: _____

Q10 Please select the total number (or best estimate) of e-commerce transactions you have made in the past month.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 or more

End of Block: Who and what, how, and how many

Start of Block: Benevolence

Q11

Because you choose $\${Q7/ChoiceTextEntryValue}$, the questions on the next seven pages will ask you about $\${Q7/ChoiceTextEntryValue}$.

For the questions on this page, consider the **benevolence** of $\${Q7/ChoiceTextEntryValue}$. Benevolence is defined here as the belief in the good intentions and kindness of another toward you.

Q12 I expect THEIR intentions are caring.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q13 I expect THEY are well meaning.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q14 THEY care about me as a customer.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q15 THEY strive to work for my best interests.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q16 THEY make sure my transactions with THEM are a great benefit to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q17 THEY keep my best interests in mind.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q18 THEY are likely to make sacrifices for me, if needed.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Benevolence

Start of Block: Competence

Q19 For the questions on this page, consider the **competence** of `#{Q7/ChoiceTextEntryValue}`. Competence is defined here as the belief in the ability of another to do as they claim they will do.

Q20 THEY are competent in providing the product or service.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q21 THEY are knowledgeable about the products (or services) THEY sell.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q22 I believe THEY can complete my transaction successfully.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q23 THEY understand the market THEY work in.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q24 THEY know how to provide excellent service.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q25 THEY perform THEIR role of providing the product or service very well.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q26 THEY have the expertise to understand my needs.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q27 THEY will deliver this product/service according to the posted delivery terms.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q28 I totally depend upon THEIR knowledge and skills.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Competence

Start of Block: Integrity

Q29 For the questions on this page, consider the **integrity** of [\\${Q7/ChoiceTextEntryValue}](#). Integrity is defined here as the belief in the honesty and truthfulness of another.

Q30 THEY are honest.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q31 THEY are truthful in THEIR dealings.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q32 THEY keep THEIR promises.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q33 THEY are genuine.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Integrity

Start of Block: TRUST

Q88 Overall, I trust $\{Q7/ChoiceTextEntryValue\}$.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: TRUST

Start of Block: Malevolence

Q34 For the questions on this page, consider the **malevolence** of $\{Q7/ChoiceTextEntryValue\}$. Malevolence is defined here as the belief in the bad intentions and ill will of another toward you.

Q35 THEIR motive is to cause harm.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q36 If I continue dealing with THEM, THEY will do something detrimental to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q37 I am bothered by THEIR malicious objectives.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q38 THEY are likely to make decisions that are harmful to me.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q39 THEIR unethical practices are injurious to me.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Malevolence

Start of Block: Incompetence

Q40 For the questions on this page, consider the **incompetence** of [\\${Q7/ChoiceTextEntryValue}](#). Incompetence is defined here as the belief that another is inept to do as they claim they will do.

Q41 I doubt THEIR competence.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q42 I worry THEY are incapable.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q43 I have no confidence in THEIR ability.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q44 THEY are incompetent in THEIR area of expertise.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q45 THEIR processes are unreliable.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q46 I feel nervous about how naive THEY are about the product.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q47 I have every reason to doubt the quality THEY can deliver.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Incompetence

Start of Block: Deceit

Q48 For the questions on this page, consider the **deceit** of $\{Q7/ChoiceTextEntryValue\}$. Deceit is defined here as the belief in the dishonesty and duplicity of another.

Q49 THEY conduct business in a deceptive way.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q50 THEY lie.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q51 THEY are untruthful in THEIR dealings.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q52 I feel THEY may be dishonest.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q53 THEY would cheat on THEIR financial statements.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q54 I believe THEY perform fraudulent transactions.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Deceit

Start of Block: DISTRUST

Q89 Overall, I distrust \${Q7/ChoiceTextEntryValue}.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: DISTRUST

Start of Block: Willingness to transact

Q55 For the questions on this page, consider your perception of
\${Q7/ChoiceTextEntryValue}.

Q56 Regarding the transaction used for this survey, ultimately, did you complete this
purchase transaction with THEM?

- I completed the transaction.
 - I did not complete the transaction.
-

Q57 I am likely to recommend THEM to my friends.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q58 I have a history of purchasing from this seller in the past.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q59 I am likely to make a purchase from THEM in the future.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Willingness to transact

Start of Block: Trust disposition

Q60 The questions on these last four pages ask about you.

The questions on this page ask about your **disposition to trust**.

Q61 I usually trust others until they give me a reason not to trust them.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q62 I generally give others the benefit of the doubt at first.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q63 My typical approach is to trust others until they prove I should not trust them.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Trust disposition

Start of Block: Mobile self-efficacy

Q64 The questions of this page ask about your **comfort level with mobile technology**.

Q65 I believe I have the ability to make purchases using a mobile device.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q66 I believe I have the ability to identify common problems with mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q67 I believe I have the ability to correct common problems with mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q68 I believe I have the ability to install features to mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q69 I believe I have the ability to remove features from mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q70 I believe I have the ability to install applications to mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q71 I believe I have the ability to remove applications from mobile devices.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q72 I believe I have the ability to use the productivity features offered by mobile devices (e.g. calendar, email, task scheduling, etc.).

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: Mobile self-efficacy

Start of Block: e-commerce self-efficacy

Q73 The questions on this page ask about your **comfort level with e-commerce transactions**.

Q74 I believe I have the ability to make e-commerce purchases.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q75 I believe I have the ability to identify common problems with e-commerce purchases.

- Strongly agree
 - Agree
 - Somewhat agree
 - Neither agree nor disagree
 - Somewhat disagree
 - Disagree
 - Strongly disagree
-

Q76 I believe I have the ability to correct common problems with e-commerce purchases.

- Strongly agree
- Agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Disagree
- Strongly disagree

End of Block: e-commerce self-efficacy

Start of Block: Demographics and drawing entry

Q77 The questions on this last page ask about your **demographics**. These questions are adapted from United States federal guidelines.

Q78 What is the highest level of education have you completed?

- Some high school
 - High school or GED equivalent
 - Some college (freshman level completed)
 - Some college (sophomore level completed)
 - Some college (junior level completed)
 - College undergraduate degree completed
 - Some graduate classes
 - Master or graduate degree completed
-

Q79 What is your ethnicity?

- Hispanic or Latino
 - Not Hispanic or Latino
-

Q80 What is your race? Mark one or more races to indicate what you consider yourself to be.

- White
 - Black or African American
 - Asian
 - American Indian or Alaska Native
 - Native Hawaiian or Other Pacific Islander
-

Q81 Sex:

- Female
- Male

End of Block: Demographics and drawing entry

Start of Block: Drawing

Q82 Thank you for helping me with my research. To enter an optional and voluntary drawing for an Amazon gift card, please enter your name and email address. One \$25 Amazon gift card will be randomly awarded for every 25 completed responses.

- Yes, I will provide my email address to enter the drawing. Note: this will redirect you to a separate survey where your email address will be collected.
- No, thank you. I decline the offer to enter the drawing.

End of Block: Drawing
