Research Note

National culture and consumer trust in e-commerce

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ABSTRACT

This study uses Hofstede's cultural dimensions theory to explain variance in consumer trust in e-commerce. We model trust as a combination of a consumer's disposition to trust and context specific trustworthiness of an online store. The study hypothesizes direct effects of national cultural dimensions on disposition to trust, and of disposition to trust on dimensions of trustworthiness. We also examine whether and how disposition to trust mediates the effects between national culture and trustworthiness of an online store. We test the hypotheses with a sample of 616 online bookstore customers from China and Finland, countries that represent opposite cultural poles in many respects. We find that national culture solely explain 23% of the variance in the consumer's general disposition to trust, and that disposition to trust is a highly significant predictor of the perceived trustworthiness of an online store. We further find that the mediating role of disposition to trust between national culture and trustworthiness depends greatly on the individual cultural dimension studied.

1. Introduction

Trust in the online environment has gained wide interest in research along with the increase in online transactions and electronic commerce becoming more popular. Lack of trust is a major barrier in the adoption of e-commerce (Chang, Cheung, & Tang, 2013) and concerns about an online store's trustworthiness are among the most important factors distinguishing online buyers from non-buyers (Kim & Park, 2013). Trust, on the other hand, is found to drive the adoption of information and communication technologies across countries (Kirs & Bagchi, 2012). Indeed, e-commerce has internationalized, and buying products online across national borders has become straightforward and convenient for consumers, providing new business opportunities for both domestic and international online stores.

Some consumers shop actively online, but others do not, and consequently managers and academics alike are interested in better understanding the underlying factors between these differences. The influence of an individual's personality on their adoption of e-commerce in addition to disclosing private information online has recently received growing academic interest (e.g. Bansal, Zahedi, & Gefen, 2016). Trust particularly plays a crucial role in e-commerce, because individuals show different levels of trust towards e-commerce, but individuals between national cultures also vary in their overall level of trust (World Values Survey, 1981–2014). Consequently, the current study integrates the theory of national culture with the research conducted on online trust, in order to explore how dimensions of national culture influence consumers' beliefs of online store's trustworthiness.

In their research agenda for trust in the online environment, Gefen, Benbasat, and Pavlou (2008) identify the dimensionality of trust, as well as the impact of culture on trust as research areas requiring further exploration. In order to address the above-mentioned research gaps, we apply the cultural theory of Hofstede (1980) to explore how dimensions of national culture influence individual's general tendency to trust, i.e. trusting disposition, and individual's beliefs about online store's trustworthiness. Theoretical research suggests that national culture and trust are interrelated (e.g. Doney, Cannon, & Mullen, 1998; Hofstede, 1980), but empirical research validating their relationship is surprisingly scarce, particularly in the online environment (Gefen & Heart, 2006; Huang et al., 2014; Hwang & Lee, 2012; Jarvenpaa, Tractinsky, & Saarinen, 1999; Yoon, 2009). In the current study we also focus on the dimensionality of trust and trust related constructs, because the constructs of trust, trustworthiness (including ability, integrity and benevolence) and disposition to trust are too commonly used synonymously and mixed in the research (see discussion e.g. Colquitt, Scott, & LePine, 2007; Serva, Benamati, & Fuller, 2005, 2002). Recently, some academics have focused on drawing a better picture on the relationship between these constructs (e.g. Colquitt et al., 2007; Serva et al., 2005; Yakovleva et al., 2010) but many of those few studies are conducted in organizational and offline settings, thus not taking into account the online environment which is significantly different from a conventional brick-and-mortar business.

The rest of the paper unfolds as follows. In the next section, we review the theoretical background of the study and thereafter show our reasoning for adopting it as the theoretical framework of this study.

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This is followed by a description of the research model and research methods. We then present the results of the data analysis and hypotheses testing. Finally, the authors draw conclusions and discuss the implications of the findings, together with limitations of the study and suggestions for future research avenues.

2. National culture and consumer trust

While the theoretical research suggests that national culture and trust are interrelated (e.g. Doney et al., 1998; Hofstede, 1980), our literature search resulted only in a handful of prior studies focusing on how the aspects of national culture impact trust and trustworthiness in the online environment. Jarvenpaa et al. (1999) were among the first to raise the question about the robustness of trust effects across national cultures, and proposed that customers in different cultures might show different expectations of what makes an online vendor trustworthy. Following research has intended to understand the influence of national culture on trust mainly by two means: either by performing a comparative cross-cultural study (An & Kim, 2008; Chen et al., 2008; Park, Gunn, & Han, 2012; Teo & Liu, 2007) or by examining how specific aspects and dimensions of national culture influence trust (An & Kim, 2008; Capece, Calabrese, Di Pillo, Costa, & Crisciotti, 2013; Chen et al., 2008; Hwang & Lee, 2012; Yoon, 2009). Gefen and Heart (2006) examine whether the definitions of trust and related constructs are applicable in two cultures that differ in individualism versus collectivism, uncertainty avoidance and power distance, and conclude that trustworthiness beliefs apply in both USA and Israel, and may thus be a relatively unvarying aspect of e-commerce. Yet they raise the concern that most of the research on the effect of cultural factors on trust has been conducted in Western countries and particularly in the United States, despite the fact that culture is a complex and multifaceted phenomenon and aspects of national culture may influence trust differently in different countries (Gefen & Heart, 2006). In a similar vein, Park et al. (2012) propose that cultural values impact how consumers with Eastern and Western backgrounds form trust in e-commerce. They find that USA tends to have a higher tendency to trust compared to South Korea. Chen et al. (2008) explore trust development among virtual community members in China, Hong Kong and Taiwan, and find no significant differences in trust development across the countries, but show that overall Chinese show a higher trust tendency.

The other stream of research aims to understand how specific dimensions of national culture influence trust. Yoon (2009), for instance, investigates the moderating effect of power distance, individualism, uncertainty avoidance and long-term orientation on the relationship between trust and consumer's purchase intention with the data collected in China, finding that long-term orientation and uncertainty avoidance moderates the relationship while power distance and individualism have no influence on it. Capece et al. (2013) replicated the study in Italy, and show that power distance and individualism moderate the relationship between trust and purchase intention. Shiu, Walsh, Hassan, and Parry (2015) show that individuals with a high individualist orientation trust public information websites less, but uncertainty avoidance has no influence on the level of trust towards public information websites. The majority of the existing studies consider only one or two aspects of national culture, focusing on understanding for instance how uncertainty avoidance (Hwang & Lee, 2012; Shiu et al., 2015), individualism versus collectivism (An & Kim, 2008; Lowry, Zhang, Zhou, & Fu, 2010; Chen et al., 2008; Shiu et al., 2015) or power distance (Chen et al., 2008) influence trust. To the best of our knowledge, only a few existing studies include more than two dimensions of national culture in one study. Consequently, we aim to respond to this research gap by exploring how the five Hofstede's culture dimensions, namely collectivism, uncertainty avoidance, long-term orientation, power distance and masculinity, influence individual's disposition to trust, and further, how disposition to trust contributes to the perceived trustworthiness of an online store, taking into account both direct and mediated effects. The current study also adds to the existing research by providing information about the relatedness of national culture and trust using datasets collected in two countries that evidently differ in several cultural aspects: China and Finland.

3. Model development

Our research model integrates Hofstede's culture theory with the trust research. Following prior research, we conceptualize trust as a formation of an individual's general trusting disposition and context specific belief about the trustworthiness of an online store, including dimensions of ability, integrity and benevolence. This follows Colquitt et al. (2007), who in their meta-analysis argue that disposition to trust (i.e. trust propensity) and trustworthiness are antecedents of trust. It appears that online trust is formed from the trusting disposition of an individual, and perceived trustworthiness of an object (e.g. online store), and consequently when referring to trust we refer to the fusion of disposition to trust and trustworthiness.

3.1. National culture

The establishment of trust is dependent upon shared motives, values, beliefs, identities and interpretations of the meanings that guide an individual's behavior and beliefs in a specific culture (Doney et al., 1998) and therefore national culture and trust are discussed as interrelated in the prior research (Doney et al., 1998; Downes et al., 2002; Gefen & Heart, 2006; Greenberg et al., 2008; Huang et al., 2014; Jarvenpaa et al., 1999). National culture consists of a set of beliefs and behaviors shared by a group of people, also known as the collective programming of the mind distinguishing members of one group from another (Hofstede, 1980). We adopt Hofstede's cultural dimensions (Hofstede, 1980; Hofstede & Hofstede, 2005; Hofstede, 2001) to explore national culture. The four original dimensions are individualism versus collectivism, power distance, masculinity versus femininity, and uncertainty avoidance (Hofstede, 1980; Hofstede & Hofstede, 2005). Later on, an additional fifth dimension assessing time orientation within a culture (long-term versus short-term orientation, also called as Confucian dynamism) was added based on the findings of the Chinese Value Survey (Hofstede & Bond, 1988; Hofstede & Hofstede,2005). Earlier research most commonly examined only one or two cultural dimensions in a single study, for example due to conceptual reasoning (Schumann et al., 2010), relevance (Hwang & Lee, 2012), or hypothesized country differences with regards to some culture dimensions. We believe that measuring all five dimensions in one model provides a more holistic picture of the phenomenon and therefore we include Hofstede's five culture dimensions in the study.

Individualism versus *collectivism* (COL) refers to the relationships of individuals within a culture (Hofstede, 1980). In individualist cultures, ties between individuals are loose: everyone is expected to look after oneself and his or her immediate family (Hofstede & Hofstede, 2005). Collectivism is the opposite, and in such cultures individuals are integrated into strong, cohesive in-groups that remain throughout one's lifetime (Hofstede & Hofstede, 2005). Prior research suggests that trust, in general, is higher in collectivist cultures compared to individualist cultures (Doney et al., 1988; Huff & Kelley, 2003).

Uncertainty avoidance (UAI) describes the extent to which members of a culture feel threatened by uncertain or unknown situations (Hofstede & Hofstede, 2005). Uncertainty about an online store's trustworthiness is often cited as one of the main reasons individuals do not involve themselves in e-commerce, and prior studies evaluate uncertainty avoidance as one of the key cultural dimension affecting trust in the online environment (Hwang & Lee, 2012; Shiu et al., 2015). Research suggests that uncertainty avoidance plays a major role in technology adoption (Srite & Karahanna, 2006) and resistance (Laukkanen, 2015). Srite and Karahanna (2006) suggest that individuals with high uncertainty avoidance levels may look to their social environment for

cues when making decisions about the adoption of new technologies. Some studies place uncertainty avoidance as a moderator of trust in e-commerce (Hwang & Lee, 2012; Yoon, 2009).

Long-term versus *short-term orientation* (LTO) describes the time orientation within a culture. Cultures scoring low in this dimension are described as short-term oriented cultures, emphasizing virtues related to the past and present, while long-term oriented cultures tend to be focused on the future (Hofstede & Hofstede, 2005). In general, long-term oriented cultures require a deeper level of trust in business relationships, and individuals in long-term oriented cultures typically require identification of the exchange partner before doing business with them (Harris & Dibben, 1999). Business relations in long-term oriented cultures are typically built on long-lasting grounds and thus mutual trust is fundamental.

Power distance (PDI) explains the way a society handles inequality among its members and is described as the extent to which less powerful members in a society expect and accept that power is distributed unequally (Hofstede & Hofstede, 2005). In low power distance cultures, opportunistic behavior is less common compared to high power distance cultures, and in low power distance cultures individuals are more participative in decision making and more willing to consult with others (Doney et al., 1998).

Masculinity versus *femininity* (MAS) describes gender roles within a culture. Masculine cultures typically value achievement, assertiveness and material reward for success, while feminine cultures emphasize values such as modesty, and tenderness, and are generally more concerned with the quality of life (Hofstede & Hofstede, 2005). Differences between masculine and feminine cultures are typically based on this reasoning, indicating that fostering harmonious relationships and values is more salient in feminine cultures than in masculine cultures. The assertion that, "Most people can be trusted," was included as one of the statements in Hofstede's original value questionnaire. The results implied that in masculine oriented cultures most people could not be trusted.

3.2. Disposition to trust

Disposition to trust (TDI) is a general and not a situation specific willingness to trust others, and it concerns an individual's beliefs about the specific other particularly at the early stages of a relationship and when experiential information about the trustworthiness of the other has not yet developed (Colquitt et al., 2007; Mayer et al., 1995). Glanville and Paxton (2007) distinguish between two perspectives that dominate research on the foundation of disposition to trust. The first stream of research presents disposition to trust as a relatively stable psychological propensity influencing an individual's trusting decisions (Glanville & Paxton, 2007; Kenning, 2008). The second stream of research is based on a social learning perspective arguing that individuals develop different levels of trust across different domains of interaction, and thus disposition to trust is the result of a wide-ranging summation of past experience in more localized domains (Glanville & Paxton, 2007). Glanville and Paxton (2007) argue that trust can be affected by changes in one's social environment and therefore the latter view better describes the foundations of disposition to trust (Glanville & Paxton, 2007).

Prior research suggests that individuals from different cultures are predisposed to trust others to different degrees, and disposition to trust may be a function of different aspects of national culture (Downes et al., 2002; Kirs & Bagchi, 2012). Results of the World Values Survey, for instance, show significant differences in the level of interpersonal trust between countries (World Values Survey, 1981–2014). This indicates that individuals between and within national cultures vary in their levels of trust. Schoorman, Mayer, and Davis (2007) suggest that national culture affects trust through the propensity variable, i.e. disposition to trust. Consequently we position individual's disposition to trust as a mediating variable between national culture and trustworthiness

dimensions. Based on earlier discussion, we hypothesize that national culture influences disposition to trust as follows:

H1. Collectivism (COL) has a positive effect on disposition to trust (TDI).

H2. Uncertainty avoidance (UAI) has a negative effect on disposition to trust (TDI).

H3. Long-term orientation (LTO) has a positive effect on disposition to trust (TDI).

H4. Power distance (PDI) has a negative effect on disposition to trust (TDI).

H5. Masculinity (MAS) has a negative effect on disposition to trust (TDI).

3.3. Dimensions of trustworthiness: ability, integrity and benevolence

Mayer et al. (1995) conceptualize trustworthiness as composed of ability (ABI), integrity (INT) and benevolence (BEN), and the following research has mainly followed their conceptualization. Trustworthiness is defined as a set of beliefs that precedes one's willingness to trust (Mayer et al., 1995; Serva et al., 2005). Recent trust research distinguishes trust and trustworthiness as closely related but separable constructs (Ben-Ner & Halldorsson, 2010; Colquitt et al., 2007; Serva et al., 2005). Colquitt et al. (2007), for instance, define trustworthiness and trusting disposition as antecedents of trust. Research conducted so far suggests that the three trustworthiness dimensions may influence behavioral outcomes in a different way (Gefen et al., 2008; Yakovleva et al., 2010) depending, for example, on the time and stage of the relationship (Mayer et al., 1995; Schoorman et al., 2007). Several studies have incorporated ability, integrity and benevolence to predict overall trust (Heyns & Rothmann, 2015; Hong & Cho, 2011; Wu et al., 2016), purchase intention (Hwang & Lee, 2012; Schlosser et al., 2006), attitudes toward technology adoption (Lin, 2011), loyalty (Gupta & Kabadayi, 2010; Nadeem, Andreini, Salo, & Laukkanen, 2015) and searching for information (Dickinger, 2011).

Ability (ABI) is defined as a set of skills, competencies and characteristics within some specific domain (Mayer et al., 1995). Ability, is also referred to as competence (McKnight, Choudhury, & Kacmar, 2002; Xie & Peng, 2009), and contains a belief that another is capable of doing what is expected (McKnight et al., 2002). This knowledge reduces the uncertainty that is involved in e-commerce (Gefen & Straub, 2004). Ability is domain specific (Mayer et al., 1995), meaning that while an online store may be highly competent in its specific area of expertise, it may lack competence in another domain. An online bookstore, for instance, may be highly competent and knowledgeable about literature, but may not be characterized equally competently in its customer service.

Integrity (INT) is an individual's perception that an exchange partner adheres to a set of principles that are accepted by an individual (Mayer et al., 1995). Integrity means that a party is perceived as being honest, makes good faith agreements, tells the truth, acts ethically, and fulfils its promises (McKnight & Chervany, 2001). Integrity convinces an individual that the expected outcomes in the exchange are fulfilled, and therefore integrity reduces the individual's social uncertainty involved in e-commerce (Gefen & Straub, 2004). In e-commerce, integrity reflects a customer belief that the online vendor will keep its promises and ethical obligations, such as delivering goods or services to the customer as agreed, and keeping private and financial information secure throughout the online relationship (McKnight & Chervany, 2001).

Benevolence (BEN) is defined as the extent to which an exchange partner is believed to want to do good to the customer (Mayer et al., 1995). Benevolence reflects the vendor's caring and motivation to act in the customer's interest (McKnight et al., 2002). Benevolence reduces uncertainty by allowing the trusting party to rule out undesirable
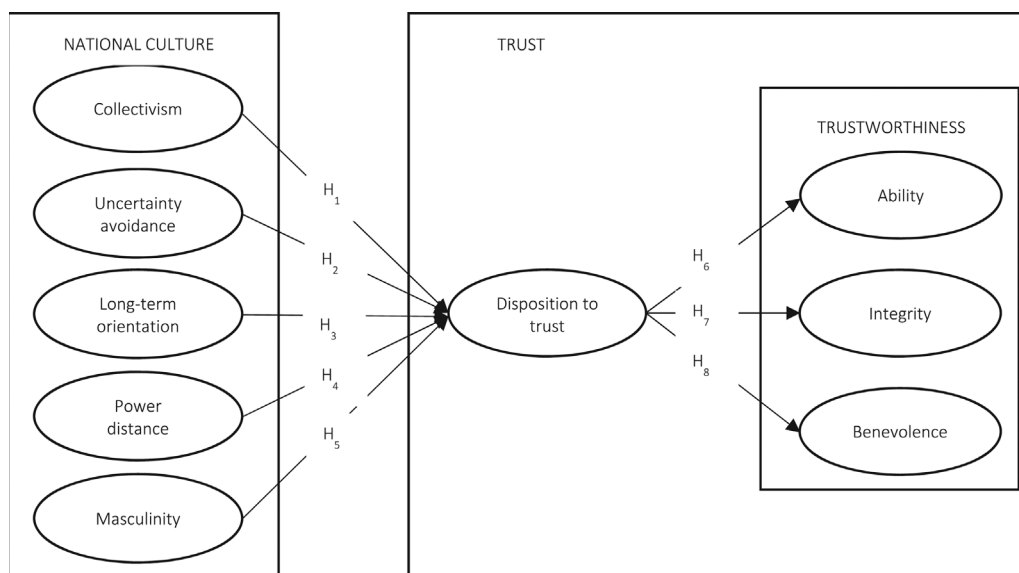
Fig. 1. Conceptual model.

behavior (Gefen & Straub, 2004). In e-commerce benevolence reflects a belief that an online store does not act unscrupulously towards a customer or take advantage of the customer in any other way (McKnight & Chervany, 2001). The perception of benevolence reflects the specific relationship between the individual and the vendor and not the vendor's kindness to all (McKnight & Chervany, 2001).

The interrelationship between disposition to trust and trustworthiness beliefs is well established in the prior research (Heyns & Rothmann, 2015; Kaur & Khanam Quareshi, 2015; Lee & Turban, 2001; McKnight & Chervany, 2001; Yakovleva et al., 2010) as disposition to trust is known to affect the interpretations in the specific relationship (McKnight et al., 2002). Several studies show that disposition to trust positively relates to trustworthiness of an online vendor (Gefen & Straub, 2004; Kim et al., 2009; Teo & Liu, 2007). Following prior research we hypothesize that disposition to trust and dimensions of trustworthiness are positively related (Fig. 1):

H6. Disposition to trust (TDI) has a positive effect on the perceived ability (ABI) of an online store.

H7. Disposition to trust (TDI) has a positive effect on the perceived integrity (INT) of an online store.

H8. Disposition to trust (TDI) has a positive effect on the perceived benevolence (BEN) of an online store.

4. Methodology

4.1. Cultural variance

In order to obtain culturally rich data, we conducted a survey in two culturally distinct countries, China and Finland. However, following suggestions based on earlier research (e.g. McCoy, Galletta, & King, 2005) we do not assume individuals within a country to possess identical cultural characteristics, but rather assume that individuals differ in their cultural orientation between and within countries. Taking into account globalization and the growing movement of the population, assuming homogeneity within a country would likely be misleading. Thus, we adopt a view that individuals within a country may show varying attitudes when measuring their cultural orientation, but accept that, in general, some countries possess greater degrees of some cultural dimensions than others. Based on classic theories on cultural differences, China and Finland represent opposite poles in multiple cultural dimensions (see e.g. Chhokar, Brodbeck, & House, 2007; Hofstede,

1980; Schwartz, 1999; Trompenaars, 1993). We rely on the Hofstede's (1980) cultural dimensions that show a great variance in collectivism, uncertainty avoidance, long-term orientation, power distance, and masculinity between China and Finland, but the countries differ also in other cultural respects. For example, according to Hall's (1981) conceptualization of differences in communication style, China represents a high-context culture while Finland is a low-context culture.

4.2. Measurement

We adopt nine constructs from the prior research. With regard to cultural dimensions we follow Yoo, Donthu, and Lenartowicz (2011) who measure Hofstede's cultural dimensions at the individual level with six measure items for collectivism, five items for uncertainty avoidance, six items for long-term orientation, five items for power distance and four items for masculinity. Our measures of trustworthiness derive from McKnight et al. (2002), who use four measure items for measuring ability, three items for integrity and three items for benevolence. Finally, we use six measure items from Gefen and Straub (2004) to measure disposition to trust. The authors made minor modifications to the measure items in order to make them applicable to the current research context. The questionnaire uses a seven-point Likert scale ranging from *strongly disagree* = 1 to *strongly agree* = 7 for measuring all other constructs except long-term orientation that was measured with *not at all important* = 1 to *extremely important* = 7.

4.3. Sample

Data from China and Finland were collected from customers of online bookstores. The questionnaire was first developed in English, and then translated into the local languages. We used an identical set of research questions in China and Finland. In China, we invited the visitors of the University Library to answer a paper questionnaire if the visitor told that he or she had experience about buying books online. Using a similar method, in Finland data was collected in the University faculty premises inviting students to participate in the survey if they had experience about buying books online. Alternatively, in Finland the students also had a choice to fill in an online questionnaire. The study was targeted at university students, who nowadays represent a highly important customer segment for online bookstores due to their ongoing studies and future customer potential. University students very well represent the so-called net generation also referred to as digital natives (Margaryan, Littlejohn, & Vojt, 2011), and they form a homogeneous

customer segment for online bookstores. The data consists of 409 and 207 effective responses from China and Finland respectively, the total sample size being 616 responses from respondents all experienced with buying books online. The average age was 22.70 in the Chinese sample, and 24.02 in the Finnish sample.

4.4. Construct validation

We created a measurement model with nine latent constructs and 42 observed variables in Amos 21.0, to validate the measurement instruments in the given context. Overall six measure items were removed from the initial model due to low factor loadings (< 0.60) and modification indices (see Appendix A). The re-specified model with the remaining 36 items indicates an acceptable fit with $\chi2 = 1532.166$ (df = 558; p < 0.001), CFI = 0.918 and RMSEA = 0.053.

We assessed discriminant validity in order to measure the extent to which the constructs in the model are truly distinct from each other (Hair, Black, Babin, & Anderson, 2010). Following Fornell and Larcker (1981), we compared the average variance extracted (AVE) of each construct with squared correlations between the constructs. The results support discriminant validity because the AVE values of all the constructs are greater than the squared CFA correlations of other constructs (Table 1).

In order to examine the likelihood of common method bias, we first performed Harman's (1970) single factor test using exploratory factor analysis in SPSS. Common method bias is due to common method variance, i.e. variance that is attributable to the measurement method (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The unrotated factor analysis results show that one-factor solution does not explain the majority of the variance. Second, we further performed a confirmatory factor analysis with a common latent factor present in the model, and no significant common variance was found when comparing the standardized regression weights across the models with the common latent factor and without it. Consequently, common method bias should not be a major concern in the current study.

5. Results

5.1. Hypotheses testing

We tested the hypothesized effects using structural equation modeling with Amos 21.0. Results show that collectivism (β = 0.321; p < 0.001) and long-term orientation (β = 0.249; p < 0.001) have a statistically significant positive effect on disposition to trust, thus supporting hypotheses H1 and H3. However, the effects of uncertainty avoidance, power distance and masculinity on disposition to trust are not statistically significant and thus give no support to hypotheses H2, H4 and H5. The results confirm a highly significant positive effect of disposition to trust on ability (0.382; p < 0.001), integrity (0.497; p < 0.001) and benevolence (0.375; p < 0.001), supporting hypotheses H6–H8. The results suggest that disposition to trust has the

Table 2
Results of the hypothesized effects.

Paths	Std. β	C.R.	Hypothesis
H1: COL → TDI	0.321***	6.668	Supported
H2: UAI → TDI	0.017 ns.	0.301	Not supported
H3: LTO → TDI	0.249***	3.766	Supported
H4: PDI → TDI	− 0.076 ns.	− 1.535	Not supported
H5: MAS → TDI	− 0.014 ns.	− 0.279	Not supported
H6: TDI → ABI	0.382***	7.700	Supported
H7: TDI → INT	0.497***	10.366	Supported
H8: TDI → BEN	0.375***	7.715	Supported

Note: Significant at: *p < 0.05, **p < 0.01, ***p < 0.001, ns. = not significant (p > 0.05).

greatest effect on integrity followed by ability and benevolence respectively (Table 2).

We also analyzed R-square estimates of dependent variables in the model referring to the fraction of variance of the dependent variables explained by the indicators. Cultural dimensions altogether explain 23% of the variance of disposition to trust which explains 14.6% of the variance for ability, 24.7% of the variance for integrity, and 14.0% of the variance for benevolence.

5.2. Mediating effect of trusting disposition

The results of the direct effects show that only two of the five cultural dimensions explain a general disposition to trust. Schoorman et al. (2007) suggest that culture may affect the perception of ability, integrity and benevolence also directly, and therefore we further explored whether disposition to trust is a true mediator between national culture and trustworthiness, or whether ability, integrity and benevolence possibly have a direct effect without mediation. Therefore, instead of solely looking at the full-mediation effect (Baron & Kenny, 1986), also referred to as indirect-only mediation (Zhao, Lynch, & Chen, 2010), we added direct paths to the model between the cultural dimensions and ability, integrity and benevolence. This provides us a better understanding of the type of mediation effects in the model (Table 3).

Following the typology of mediations and non-mediations developed by Zhao et al. (2010), collectivism has a competitive mediation effect on ability through disposition to trust. When a competitive mediation effect exists, both a mediated and a direct effect exist between the constructs, but the effects point in opposite directions (Zhao et al., 2010). Collectivism has an indirect-only mediation effect on integrity and benevolence, meaning that only a mediated effect exists, but there is no direct effect between the constructs (Zhao et al., 2010). Uncertainty avoidance has a negative direct-only non-mediation effect on all three dimensions of trustworthiness. This means that a negative direct effect exists between uncertainty avoidance and the trustworthiness dimensions, but there is no mediated effect via disposition to trust. Long-term orientation has a complementary mediation effect on ability, integrity and benevolence. Complementary mediation means

Table 1
Construct reliabilities and AVE estimates.

Construct	CR	AVE	1	2	3	4	5	6	7	8	9
1. COL	0.897	0.637	**0.798**								
2. UAI	0.904	0.653	0.279	**0.808**							
3. LTO	0.804	0.509	0.280	0.621	**0.713**						
4. PDI	0.874	0.637	0.081	− 0.083	− 0.279	**0.798**					
5. MAS	0.777	0.539	0.230	0.096	0.029	0.386	**0.734**				
6. TDI	0.860	0.557	0.372	0.243	0.333	− 0.139	0.013	**0.746**			
7. ABI	0.804	0.510	0.145	0.237	0.371	− 0.048	0.108	0.330	**0.714**		
8. INT	0.899	0.748	0.233	0.241	0.354	0.005	0.100	0.457	0.663	**0.865**	
9. BEN	0.753	0.511	0.317	0.184	0.269	0.157	0.308	0.322	0.529	0.486	**0.715**

Note: Square roots of AVE estimates are on the diagonals; correlations of the constructs are below the diagonals.

Table 3
Results of the mediation analysis.

Effects between cultural dimensions and disposition to trust		Effects between cultural dimensions and trustworthiness		Direct effects between cultural dimensions and trustworthiness		Type of mediation
Path	Std. β	Path	Std. β	Path	Std. β	
COL → TDI	0.328***	TDI → ABI	0.277***	COL → ABI	−0.100*	Competitive mediation
UAI → TDI	0.027 ns.	TDI → INT	0.394***	COL → INT	−0.036 ns.	Indirect-only mediation
LTO → TDI	0.191**	TDI → BEN	0.240***	COL → BEN	0.086 ns.	Indirect-only mediation
PDI → TDI	−0.097 ns.			UAI → ABI	−0.143*	Direct-only nonmediation
MAS → TDI	−0.036 ns.			UAI → INT	−0.129*	Direct-only nonmediation
				UAI → BEN	−0.164**	Direct-only nonmediation
				LTO → ABI	0.508***	Complementary mediation
				LTO → INT	0.431***	Complementary mediation
				LTO → BEN	0.378***	Complementary mediation
				PDI → ABI	0.099 ns.	No effect nonmediation
				PDI → INT	0.156**	Direct-only nonmediation
				PDI → BEN	0.191***	Direct-only nonmediation
				MAS → ABI	0.123*	Direct-only nonmediation
				MAS → INT	0.078 ns.	No effect nonmediation
				MAS → BEN	0.236***	Direct-only nonmediation

Significant at: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$, ns. = not significant ($p > 0.05$).

that both a mediated and a direct effect exist between the constructs, and both effects point in the same direction (Zhao et al., 2010). Neither direct nor indirect effects exist between power distance and ability, indicating no effect and non-mediation. Power distance, however, has direct-only effects on integrity and benevolence. Masculinity has a direct-only effect on ability and benevolence. Masculinity has neither a direct nor an indirect effect on integrity, indicating no effect and non-mediation.

6. Discussion and conclusion

6.1. Theoretical implications

The current study attempts to bring more insight to the scholarly discussion on the role of trust in e-commerce by examining the influence of national culture on disposition to trust and trustworthiness. Prior research suggests that individuals show different levels of a disposition to trust, and their disposition to trust is influenced by factors such as the individual's cultural background, personality and experiences (Mayer et al., 1995). Based on this reasoning, we formed hypotheses to examine the influence of Hofstede's cultural dimensions on disposition to trust, and further, how disposition to trust contributes to the perceived trustworthiness of an online vendor.

The results indicate that 23% of the variance in an individual's trusting disposition is explained solely by culture. Moreover, this cultural effect appears to derive mainly from collectivism and long-term orientation as these dimensions showed statistically significant effects on the disposition to trust, while the effects of uncertainty avoidance, power distance, and masculinity were non-significant. The results further show that disposition to trust has a highly significant positive effect on all three dimensions of trustworthiness: ability, integrity and benevolence. This means that a high level of trusting disposition positively influences an individual's perception of an online store's trustworthiness, and that the three distinct but yet interrelated dimensions of trustworthiness are all relevant in determining the trustworthiness of an online store. Out of the three dimensions of trustworthiness, disposition to trust has the greatest influence on integrity, followed by ability and benevolence.

We took a deeper look at the construct relationships by performing a post hoc test in which we examined the mediator role of disposition to trust between national culture and trustworthiness. Based on these results it seems to be too simplistic to consider the influence of national culture on trustworthiness to be fully mediated by disposition to trust, as culture seems to influence situation specific trustworthiness not only

through one's disposition to trust but sometimes also directly. Overall trustworthiness is a complex sum as Kenning (2008), for instance, finds that general trust is able to substitute in situation specific trustworthiness. Adding direct paths between cultural dimensions and trustworthiness to the model reveals that all five forms of mediation suggested by Zhao et al. (2010) are present in the interplay. Some of the effects between national culture and trustworthiness are direct-only effects while other effects are either fully or partially mediated by disposition to trust, as our original hypotheses suggest. On the other hand, some dimensions of national culture do not seem to influence disposition to trust or trustworthiness at all, indicating neither a direct nor an indirect effect.

Based on our results, cultural dimensions seem to have a clearly distinct influence on ability, integrity and benevolence. This is evident particularly in the case of collectivism, power distance and masculinity, strengthening earlier notions, according to which ability, integrity and benevolence are interrelated but clearly distinct from each other (Gefen et al., 2008; Schoorman et al., 2007). For example, ability is the only dimension of trustworthiness which plays a role for those with a highly collectivist orientation. Research suggests that the importance of the dimensions of trustworthiness may depend upon the type of relationship (Yakovleva et al., 2010) and the stage of the relationship (Schoorman et al., 2007), but it seems that differences also exist with regard to an individual's cultural orientation. From a theoretical perspective, the current study provides valuable insights about the interrelationship of national culture and trust. We will next discuss these implications one cultural dimension at a time.

6.1.1. Collectivism

The applied measure items were formulated to measure the collectivist end of the individualism-collectivism continuum. Results of the study show that a highly collectivist orientation is associated with a high level of disposition to trust. Collectivism was found to have a significant negative effect on the trustworthiness dimension of ability, while no such effect exists for integrity or benevolence. A competitive mediation effect exists between collectivism and ability, while only an indirect effect exists for collectivism on integrity and benevolence. In general, research has evinced that individuals with a collectivist orientation typically show trust towards their in-group members, but out-group members and unfamiliar members are typically less trusted (Fukuyama, 1996; Triandis et al., 1988). Our results indicate that a collectivist orientation has a significant positive influence on disposition to trust. On the other hand, our results indicate that collectivism has a negative direct effect on ability. It seems that individuals with a

highly collectivist orientation may not perceive online stores as trustworthy, even if they perceive the store as being capable, and thus individuals with collectivist orientation may assess the trustworthiness of an online store by other means that this study fails to take into account. However, given the relatively weak (p < 0.05) signal of statistical significance of the direct negative effect between collectivism and ability, we call for further research to pay attention to this effect.

6.1.2. Uncertainty avoidance

A direct negative effect exists between uncertainty avoidance and all three dimensions of trustworthiness with no mediation effect through disposition to trust. Thus, a high level of uncertainty avoidance reduces perceptions of an online store's ability, integrity and benevolence. This finding supports prior research, according to which high level of uncertainty avoidance may hinder adoption of online shopping and trust involved in it (Lim, Leung, Sia, & Lee, 2004; Yoon, 2009). In general, individuals with a higher tolerance of uncertainty are typically more disposed to adopting new technologies and innovations than individuals who prefer to avoid uncertainty (Leidner & Kayworth, 2006). Overall, e-commerce involves greater uncertainty than traditional brick-and-mortar business, and thus it is logical that high uncertainty avoidance decreases the perceived trustworthiness of an online store. Srite and Karahanna (2006) suggest that individuals with a high uncertainty avoidance level might look for cues about an online store's trustworthiness from their social environment (Srite & Karahanna, 2006) and thus may prefer to interact with well-known and familiar online stores compared to online stores unknown to them. However, as our study shows, uncertainty avoidance does not have an effect on consumers' general disposition to trust others. This means that the consequences of uncertainty avoidance are context specific, related to specific products, services, and vendors. This further emphasizes the importance of separating a general disposition to trust from context specific trustworthiness in trust research.

6.1.3. Long-term orientation

In long-term orientated cultures business relationships are typically built on a long-lasting basis and trust in the exchange partner is a crucial element of such a business relationship. The results of this study show a significant positive effect of long-term orientation on disposition to trust, as well as on all three dimensions of trustworthiness indicating a complementary mediation effect. Long-term orientation has the most influential effect on ability, followed by integrity and benevolence. These results are interesting, because prior studies often ignore the key role of long-term orientation in online trust building. Excluding long-term orientation from the prior studies may be explained by the fact a time orientation was not included in Hofstede's original theory and it was identified only later based on the findings of the Chinese Values Survey (Hofstede & Bond, 1988). However, our findings suggest that long-term orientation has a major role in online trust building, and thus ignoring long-term orientation may significantly bias the results. Future studies should take this into consideration.

6.1.4. Power distance

Power distance has a direct positive effect on integrity and benevolence, but not on ability. These effects are not mediated by disposition to trust. Furrer, Liu, and Sudharshan (2000), for example, propose that in large power distance cultures customers typically tolerate failure better and do not expect a great deal of reliability with their business partners. Our results indicate that individuals high in power distance evaluate trustworthiness based on integrity and benevolence, i.e. an assessment that the store is reliable and does not take advantage of the customer (McKnight & Chervany, 2001). In practice, the integrity of an online store may be assessed by evaluating, for example, how accurately the store delivers the ordered products and what measures the store takes to ensure that customer related and financial information is kept secure throughout the customer relationship. Benevolence, too,

plays a role for individuals high in power distance, reflecting the belief that an online store is motivated to act in the customer's interest without taking advantage of the customer.

6.1.5. Masculinity

The employed measure items assess the masculinity end of the masculinity-femininity continuum. We find a direct effect of masculinity on ability and benevolence, but not on integrity. Paths between masculinity and trustworthiness are not mediated through disposition to trust. Based on the results, ability and benevolence form the basis of trustworthiness for individuals with highly masculine orientation. Our results indicate that even though benevolence has most typically been associated with the femininity end of the masculinity-femininity continuum (Schoorman et al., 2007; Schumann et al., 2010), perceiving an online store as benevolent is equally important for individuals with masculine orientations. For example, Schoorman et al. (2007) associate masculinity with ability, and results of this study lend support to their proposition. Masculine cultures are typically more action-oriented, competitive and performance oriented (Schoorman et al., 2007) and thus it makes sense that the trustworthiness of an online store is evaluated based on an assessment of the abilities of the store.

6.2. Managerial implications

Results of the present study provide evidence that aspects of national culture influence trust in e-commerce, and consequently practitioners should be conscious of these differences particularly in international e-commerce. Prior research has evinced that general level of trust varies across countries and cultures (World Values Survey, 1981–2014) and customers from different cultures may form trust differently (Huang et al., 2014). The results of our study show a statistically significant positive effect of collectivism and long-term orientation on disposition to trust, indicating that disposition to trust has a significant role in trust development, particularly in such cultures that possess high levels of both collectivism and have long-term orientations. Following Hofstede's classification such countries include China, Hong Kong, South Korea and Taiwan, for instance (Hofstede 1980; Hofstede 2001). On the opposite pole are countries such as the United States, the United Kingdom and Australia, scoring low in their degree of long-term orientation and locating at the individualist end of the individualism-collectivism continuum. South Korea, Taiwan, Hong Kong and China are among the highest in the Asia Pacific region in terms of e-commerce penetration (e.g. Statista, 2016), which may partly be explained by the influence of national culture on trust towards e-commerce. On the other hand, results also show that national culture not only influences individual's disposition to trust, but may influence beliefs about online store's trustworthiness also directly. The results of our study indicate that ability, for instance, is influenced by uncertainty avoidance, collectivism, long-term orientation and masculinity, while uncertainty avoidance, power distance and long-term orientation influence on integrity. All other cultural dimensions except collectivism influence benevolence.

Overall, assessing trustworthiness in the online environment is more challenging than in brick-and-mortar businesses, because clear signs of an online store's trustworthiness may not be easy to obtain. From a customer's point of view, ability may be the most objective (Yakovleva et al., 2010) and thus the easiest measure of an online store's trustworthiness because information about the online store's competence and capabilities may be visibly obtained through the online store's website, for example by having a comprehensive product range, the professional presentation of available products and by assessing the reviews of peer buyers. However, assessing an online store's integrity and benevolence may prove to be more challenging because these are more significantly based on an individual's subjective assessment. Customer reviews and indications of objective third-party security certificates, for example, may produce information about an online

store's integrity reflecting that the online store typically fulfills its agreements as promised and adheres to secure ways of processing customer related data. However, clear signs of an online store's benevolence are specifically challenging to obtain (Yakovleva et al., 2010), and may require an established and long customer relationship before the perception of an online store's benevolence develops.

6.3. Conclusion

The findings of our research lend support to earlier notions according to which national culture and trust are interrelated. Schoorman et al. (2007) suggest that national culture affects trust through disposition to trust, and results of the present study partly support this. However, results of the current study indicate that not all the effects between cultural dimensions and trustworthiness are mediated through disposition to trust, but national culture may also directly influence the context specific perception of an online store's trustworthiness. Thus, the interplay between national culture and trust seems to be manifold and cultural orientations mirroring Hofstede's cultural dimensions may influence disposition to trust and trustworthiness differently.

Appendix A. Constructs, measurement items and standardized regression weights.

Construct	Measurement item	Std. regression weight
Collectivism	Individuals should sacrifice self-interest for the group.	0.752
	Individuals should stick with the group even through difficulties.	Removed
	Group welfare is more important than individual success.	0.856
	Individuals should only pursue their goals after considering the welfare to the group.	0.803
	Group loyalty should be encouraged even if individual goals suffer.	0.810
	Group success is more important than individual success.	0.760
Uncertainty avoidance	It is important to have instructions spelled out in detail so that I always know what I'm expected to do.	0.766
	It is important to closely follow instructions and procedures.	0.869
	Rules and regulations are important because they inform me of what is expected of me.	0.856
	Standardized work procedures are helpful.	0.746
	Instructions for operations are important.	0.797
Long-term orientation	Careful management of money.	0.629
	Going on resolutely in spite of opposition.	Removed
	Personal steadiness and stability.	0.765
	Long-term planning.	0.797
	Giving up today's fun for success in the future.	Removed
	Working hard for success in the future.	0.654
Power distance	People in higher positions should make most decisions without consulting people in lower positions.	0.707
	People in higher positions should not ask the opinions of people in lower positions too frequently.	0.816
	People in higher positions should avoid social interaction with people in lower positions.	0.877
	People in lower positions should not disagree with decisions by people in higher positions.	0.786
	People in higher positions should not delegate important tasks to people in lower positions.	Removed
Masculinity	It is more important for men to have a professional career than it is for women.	0.642
	Men usually solve problems with logical analysis; women usually solve problems with intuition.	0.775
	Solving difficult problems usually requires an active, forcible approach, which is typical of men.	0.775
	There are some jobs that a man can always do better than a woman.	Removed
Disposition to trust	I generally trust other people.	0.704
	I tend to count on people.	Removed
	I generally have faith in humanity.	0.616
	I feel that people are generally well meaning.	0.666
	I feel that people are generally trustworthy.	0.877
	I feel that people are generally reliable.	0.843
Ability	They are competent and effective.	0.649
	They perform their role of giving advice very well.	0.605
	Overall, they are capable and proficient.	0.848
	In general, they are very knowledgeable about their own merchandise.	0.731
Integrity	They are truthful in their dealings with me.	0.851
	I would characterize them as honest.	0.924
	They would keep their commitments.	0.817
Benevolence	I believe that they would act in my best interest.	0.610
	If I required help, they would do their best to help me.	0.649
	They are interested in my well-being, not just their own.	0.859

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