Strengthening institutional-based trust for sustainable consumption: Lessons for smart disclosure

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A B S T R A C T

Smart disclosure constitutes a form of open data policy that has the objective of promoting more sustainable economies and innovation by providing consumers with information to help them make better purchasing decisions. Trust in the information regarding product and certification is crucial for the adoption and usage of smart disclosure tools that make use of such information. In this paper, we investigate the determinants of trust in sustainable product information through a survey administered in Mexico and the United States. Our results suggest that information indicating brands and certificates reputation are important factors that encourage the development of trust. Our results also suggest that additional information to verify labels does not emerge as significant predictor to induce trust. We argue that to be useful, such information should be aggregated and presented to consumers in a simple way right at their fingertips. Finally, we found that information indicating support from government agencies and endorsement from non-for-profit organizations significantly influence consumer’s trusting beliefs on sustainable practices information.

1. Introduction

With the heightened attention to the issue of sustainable development and environmental sustainability around the world, the question of the role of government is under careful examination. One traditional role of government has been regulating production standards to enforce modes of production and economic activities in an effort to reduce negative impacts on the environment. An emerging government role, however, focuses on providing access to information that fosters market transparency and efficiency. This new role is based on the assumption that better informed consumers will make decisions that reflect their environmental and social values for sustainable products, which may set a chain reaction to the supply chain to produce and operate in more sustainable modes (Cobb, 2012; Howard, 2012; Luna-Reyes et al., 2012; McKee, 2012; Sunstein, 2011; Thaler, 2013; Thaler & Sunstein, 2008).

The open government and smart disclosure initiatives are examples of this emerging government role led by the Obama Administration to promote innovations that help consumers make important marketplace decisions (Howard, 2012; Thaler & Sunstein, 2008). Smart disclosure tools and applications have been developed to exemplify that information disclosed and assembled for the public would empower consumers in matters such as education, energy consumption, health care, transportation and others (Executive Office of the President National Science and Technology Council, 2013). However, disclosing information through open government initiatives does not automatically lead to informed decisions if the information is not in a form that can be readily processed and trusted by consumers. In this way, the Smart Disclosure initiatives are still in its forming stage because of a lack of integrated and high quality information regarding the sustainable practices of products, especially trustworthy information valued by consumers. Moreover, we are still lacking an in-depth understanding about consumer trust mechanisms in using information. It is still not clear what information induces consumers’ trust and how consumers react to various elements of information regarding product, producers, brand, certification, government enforcement, independent NGO review, and other information that can be disclosed.

Trust is viewed as an individual’s belief that another individual or group will behave in good faith, with honesty, and would not take excessive advantage even when the opportunity exists (Cummings & Bromiley, 1996). Although trust may be induced by different mechanisms, there are two different modes of trust production that are particularly relevant to the domain of this study, cognitive-based trust and institution-based trust (Luna-Reyes et al., 2013). Cognitive-based trust is founded on information and rational choice. It arises
only when the beneficial intention and competence of another is proved by reliable information (Lewicki & Bunker, 1995; Mayer, Davis, & Schoorman, 1995; Simons, 2002). Thus, trust in sustainable claims rests on the availability and credibility of product information that can be traced through the entire supply chain. On the other hand, trust is often related to institutional frameworks that make opportunistic behaviors less likely due to the existence of mechanisms such as guarantees, legal contracts or predominant norms that regulate the conscious and unconscious behavior of individuals. Therefore, it is reasonable to postulate that disclosing information indicating the existence of legal frameworks and other institutional procedures that help to assure production compliance to sustainability standards could lead to high levels of consumer trust.

In this study, we integrate these two perspectives, and investigate the determinants of consumer trust in the presumed sustainability of a product. More specifically, we investigate how consumer perception of information related to product, producer, and certification influence their trusting belief on the sustainability claim of a product. Although trust has been studied in various contexts, very few studies focus on trust in information. By drawing attention to the concept of trust in the literature of smart disclosure and sustainable consumption, we are attempting to bridge the gap of knowledge about trust in sustainability claims conveyed through various information indicators. We argue that an understanding of the impact of being exposed to various information regarding product and certification on consumers' trust belief is crucial for the adoption and usage of smart disclosure tools that make use of such information, and conversely, understand the limitations of such tools in promoting sustainable consumption. In other words, it is essential to know what information consumers would be able to depend upon and act on, thus, what information needs to be disclosed. On the practical side, such understanding is necessary for data owners and publishers in ensuring that what is made available is relevant and appropriate to users' needs. It will also provide behavior guidance for application developers to develop tools that will match the needs and habits of consumers.

This study is a component of an interdisciplinary research project to build interoperable data architectures that can be used to support consumers' decision making for sustainable product purchases (Luna-Reyes et al., 2012, 2013). One of the most critical issues emerged from the early findings of this project is trust (Sayogo et al., 2014). As such, identification of the information cues that influence consumer's trust on the sustainability claim of a product could assist the development of such interoperable architecture, which needs to consider the type of information that is relevant from consumers' point of view.

This paper is organized into five sections including the foregoing introduction. Section two includes a literature review on trust, including the theoretical model and hypothesis used in the paper. Section three outlines the methodology, highlighting the data collection process, measurement of variables and our analysis techniques. Section four describes the analysis and results. Finally, section five discusses our key findings and provides concluding remarks.

2. Literature review

This literature review presents an overview of consumer trust in product information, particularly for sustainable products. To provide some context, we first discuss the application of smart disclosure policy to support sustainable consumption. Subsequently, we outline the underlying dimensions of trust belief and main determinants of trust production.

2.1. Smart disclosure for sustainable consumption

Smart disclosure is a policy initiative promoted by the US government to use information disclosure as a regulatory approach. Smart disclosure is defined as the "act of making data more readily available and accessible, both to consumers directly and to innovators who can use it to build tools that help consumers make better informed decisions, and create more transparent, efficient market for goods and services" (Executive Office of the President National Science and Technology Council, 2013). The basic premise of smart disclosure is giving more power to the general public by transferring control of personal data from the hands of corporate interests to the public (Cobb, 2012; Sunstein, 2011).

Recently, smart disclosure policy has been applied in various sectors such as education, energy and environment, health care, finance, food and nutrition, safety, telecommunication, transportation and others (Executive Office of the President National Science and Technology Council, 2013). Proponents of smart disclosure argue that such policy can also be used to help consumers in making informed decisions by minimizing behavioral biases resulting from information overload and aversion to complexity that consequently cause consumers to make undesirable choices (McKee, 2012; Thaler, 2013; Willis, 2013). In the energy and utility domains, smart disclosure policy has been used to support sustainable consumption of energy through the Green Button initiative (Sinai et al., 2012).

Such potential of smart disclosure also fits very well with the increasing trend of information traceability in sustainable consumption. There is increasing demand for accurate, timely and traceable information about the sustainability of companies' products and practices. Consumers are requesting more information to verify company's sustainability practices, particularly in food and agriculture industry (Collins, Steg, & Koning, 2007; Locke & Romis, 2007; Locke, Kochan, Romis, & Qin, 2007; Opara, 2002; Wilson & Clarke, 1998).

2.2. The importance of trust in sustainable consumption

In spite of consumers' expressed concern for the environment and the growing prevalence of green products on retail shelves, sustainable products going mainstream still has a long way to go partly because consumers are not willing to purchase sustainable products as expected. Studies found that difficulties in understanding product performance, lack of expertise by consumers, and higher prices constitute some of the key reasons for not buying sustainable products (Gleim, Smith, Andrews, & Cronin, 2013; Marian & Thøgersen, 2013; Thøgersen & Schrader, 2012). Gleim et al. (2013) stated that time and effort needed to evaluate and search for sustainable product information impede green consumption behavior.

In reality, information that can prove the quality of sustainable products is difficult to obtain and verify. In searching for products, consumer typically relies on the dominant quality attributes, namely search, experience, credence and potemkin attributes (Gabriele, Schramm, & Spiller, 2005). A search attribute, such as freshness or appearance, is known before the purchase and consumers have the ability to search for it. Experience attributes, such as taste, are only known after the consumption of the product. Credence attributes, such as nutrition or contamination, are difficult to be observed by consumers, but they can rely on third parties for quality assurance. Potemkin attributes are process-related qualities that cannot be proved and controlled through laboratory analyses by either the consumers or external institutions. Only close monitoring of the internal production process would have a chance to detect fraud and mislabeling (Gabriele et al., 2005). Sustainability claims, such as organic or fair-trade, are essentially potemkin attributes that are especially susceptible to the lack of quality information on the side of consumers. The difficulties in verifying and controlling process claims that such products are produced and processed according to specific environmental, social, and economic standards give rise to conditions for fraud and opportunistic behaviors in such markets, a situation that calls for measures for quality assurance.

In response, various product-certifying systems have been developed to provide assurance to the quality claim. Certification systems, however, are not as effective for two reasons. First of all, the potemkin
attributes are difficult to verify by consumer agencies, NGOs and public authorities, and the reliability of product labels is highly contingent on the types of external audits and their implementation (Gabriele et al., 2005). As a result, numerous scandals and frauds have been detected in organic food markets in both US and EU (Gabriele et al., 2005; Liu, 2011). A second reason that limits the effectiveness of certification system is the proliferation of certification programs. There is a large number of certification associated with sustainable practices with varying standards and certification processes. Currently, 458 ecolabels existed in 197 countries, and 25 industry sectors (ecolabelindex, n.d.), making it difficult for consumers to assess the meaning and robustness of the certification criteria, and thus, trustworthiness of a label.

Smart disclosure policy has the potential to play an important role in supporting sustainable consumption in a sense that it could make it possible to integrate information regarding the business practices along the supply chain. Smart disclosure initiative could foster the development of tools and applications that reduce complexity and information overload and facilitate purchasing decisions (Luna-Reyes et al., 2013; Watson, McCarthy, & Rowley, 2013). Developing such tools, however, requires an in-depth understanding about what trust is, and what the underlying sources of trust or modes of trust production are, and how trust can be established with the right mix of information about search, experience, and credence attributes, as well as institutional mechanisms indicating assurance for potemkin attributes.

Many typologies of trust have been proposed in literature (Castaldo, 2007). They are based on single dimensions of trust (e.g. cognitive, emotional, behavioral), on a variety of contents (and different drivers), on different analytical levels (interpersonal or interorganizational), and on various levels of consistency (e.g. thick vs. thin), producing a wide range of concepts. Although there is no single accepted definition, two themes appear consistently: vulnerability and positive expectation or optimistic belief (Rousseau, Sitkin, Burt, & Camerer, 1998). Trust is seen as accepting the risks associated with the type and degree of interdependence inherent in a given relationship (Sheppard & Sherman, 1998). Trusting behaviors are actions that increase the trustor's vulnerability to the trustee whose behavior is not under the direct control of the trustor (Zand, 1972). Many scholars have highlighted the positive expectations of or optimistic beliefs about another party as the basis of trust (Cummings & Bromiley, 1995; Hart & Saunders, 1997; Mishra, 1995). Mishra (1995), for instance, argues that willingness to trust is based on the belief that the trustee is competent, open, concerned, and reliable; and the belief that the trustee will not behave opportunistically, even when encountering short-term incentives and uncertainty about the long-term benefit (Chiles & McKmackin, 1996). Trust, in such context, can be viewed as an individual's belief or a common belief among a group of individuals that another individual or group will behave with good-faith, honesty, and would not take excessive advantage even when the opportunity exists (Cummings & Bromiley, 1996). In this study, we adopt a definition developed by Rousseau et al. (1998), which largely reflects these distinctions. They defined trust as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intention or behavior of another” (p. 395).

For the purposes of this study, trust in sustainable claim of a product is preliminarily defined as the belief that the product claim information provided is reliable and can be used as the basis for purchases. This definition highlights individual assessment or perception of the trustworthiness, i.e. trust beliefs (Mayer et al., 1995; Sheppard & Sherman, 1998). Trust belief is a multi-dimensional concept, and it has been widely acknowledged to encompass three dimensions: competence, integrity, and benevolence (McKnight & Chervany, 2002). Competence is defined as a group of skills and characteristics that enable a party to have influence within some specific domain (Mayer et al., 1995); integrity as the degree to which the trustee is believed to adhere to a set of principles that the trustor finds acceptable, such as the principle of justice and consistency between words and action (Jarvenpaa, Tractinsky, & Saarinen, 1999; Mayer et al., 1995); and benevolence as the extent to which a trustee is perceived to be concerned about the welfare of the trustee, aside from an ego-centric profit motive (Porter & Donthu, 2008).

2.3. Antecedents of trust

Large number of studies focused on evaluating the antecedents of trust (Büttner & Görritz, 2008; Gefen, Karahanna, & Straub, 2003; Pavlou, 2002; Wang & Benbasat, 2008). Trust can take different forms in different relationships, such as calculative-based, identify-based, institutional-based, and deterrent-based trust, which suggests the existence of distinguishable sources for trust production (Zucker, 1986; Lewicki & Bunker, 1995; McAllister, 1995; Sheppard & Sherman, 1998; Rousseau et al., 1998). We adopted such an approach to study antecedence for trust in sustainable product because it reduces substantially the theoretical complexity and intangibility of the notion of trust, and more importantly, it is instrumental in identifying tangible ways by which the optimal kind of trust can be established, remedied by targeting the right sources, or compensated by another kind of trust if one type is breached and impossible or very costly to be remedied. Two types of trust antecedence, cognitive-based trust and institution-based, are particularly fitting for studying sustainable product trust development, and thus, they are selected as the focus of this study.1 Cognitive-based trust is based on information and rational choice; trust arises only when the intention and capability of another is proved by reliable information. Institution-based trust is based on a variety of institutional factors, such as legal framework and structural assurance, and is generated beyond a given transaction and specific relationship (Gefen et al., 2003).

2.3.1. Disposition to trust

In addition to these two categories of trust sources, previous studies place disposition to trust as a crucial predictor of trust, in particular when an individual enters a new situation (Jiang, Jones, & Javie, 2008; Mayer et al., 1995; McKnight, Cummings, & Chervany, 1998). In the initial stages of a relationship, as people have had less interactions, lack of social cues or familiarity with each other, they are forced to base their trust primarily on personality-related traits (Gefen et al., 2003). This implies that “a tendency to be willing to depend on others across a broad spectrum of situations and persons becomes a measure of an individual’s disposition trust (McKnight & Chervany, 2002). This personality-related trait means that some individuals have higher propensity to trust while some others have lower in similar situation, including purchasing decisions (Mayer et al., 1995). Thus, in any given relationship and exchange, disposition to trust takes an important role for forming trust and it will affect individual perception toward people and situations. Consequently, disposition to trust influences individuals, such as consumers, in the formation of trusting beliefs, intentions and behaviors (Grabner-Kräuter & Kalusch, 2003). In online settings, studies have empirically tested the impact of disposition to trust. Gefen (2000) demonstrated that consumers’ disposition to trust affect their trust in the vendor when they purchase online. This relationship also has been verified in virtual communities, relating predisposition to trust behaviors in knowledge acquisition from other community members (Ridings, Gefen, & Arinze, 2002). Therefore, we propose the following hypothesis.

1 We intentionally choose not to include identity-based trust, because the basis for such trust is on familiarity and shared identity, which is more appropriate for studying interpersonal trust than trust on sustainable product claim. Deterrence-based trust was also not selected because there is disagreement with regard to whether deterrence-based trust, the kind of trust established on the threat of costly sanction in the case of violation, is a form of trust, for the reason that deterrence is a control mechanism while strict control and positive expectations on intention are clearly incompatible notions. Deterrence may indeed limit the willingness of parties to be further interdependent, thus, impeding the development of trust (Rousseau et al., 1998).
Hypothesis 1. Disposition to trust in information supplied in product labels and packaging positively influences consumers' formation of trusting beliefs.

2.3.2. Cognitive based trust

Trust in sustainable products is affected by attributes of trustee (Beldad et al., 2010; Gefen, Benbasat, & Pavlou, 2008). One factor contributing to the perceived trustworthiness of a company's products or services is reputation. Gefen (2000) argues that users use cognitive familiarity as leverage to form trust on trustee in initial dealing with a trustee (Gefen, 2000). Individuals use reputation as surrogate of trustworthiness in forming initial trust relationships with unfamiliar parties (Li, Hess, & Valacich, 2008). Trustees with good reputation are deemed more trustworthy (McKnight et al., 1998) and reputation may affect trusting beliefs about the competence, benevolence and integrity of a given trustee (Li et al., 2008). Thus, we posit that brand and company reputation information is conduite for the formation of trusting beliefs.

Hypothesis 2. Information revealing brand and company reputation has positive influence on consumers' formation of trusting beliefs.

Perceived assurance indicators, including certificates and special seals, are also important antecedents to trust. Kim and Kim (2011) conducted an online experiment to test hypothesized relationship between third-party certification and initial trust, and they found positive effects of third-party seal on trusting beliefs and trusting intentions. Thus, we form the following hypothesis.

Hypothesis 3. Information revealing certification reputation has positive influence on consumers' formation of trusting beliefs.

As was mentioned earlier, consumer are demanding traceable information beyond of a simply logo or seal that could allow them to know more about the process oriented attributes, potentially reducing the information asymmetry. Consumer's ability in gaining additional information across the supply chain about the standards and processes associate with certifications such as date of inspection or the organization/name of the inspector, and in verifying certification information might reduce confusion of various labels and deter opportunistic behaviors of the sellers. The role of additional information, however, is inconclusive in previous studies. On one hand, the existence of additional information is important in increasing the knowledge base, which in turn influences the building of cognitive-based trusting belief (Li et al., 2008). On the other hand, providing more information may be counter-productive for trust formation because individuals have limited cognitive ability in processing and acting on large amount of information (Bigley & Pearce, 1998; Ng & Chua, 2006). Following this logic, we developed the following hypothesis:

Hypothesis 4. Additional information about the standards and processes associated with certifications has positive influence on consumers' formation of trusting beliefs.

2.3.3. Institution-based trust

Institutional structures are also crucial for the development of trust (Lewis & Weigert, 1985). The existence of a set of institutional factors, such as societal norms and legal systems at the societal level, ease the way for risk taking and trust development. For instance, Rousseau (1998) reasoned that the legal system, which may be viewed as a control mechanism, nonetheless, promotes trust because it makes “expectations of harm low-probability events” (p. 400). Lane and Bachmann (1996) observed that the existence of stable legal, political and social institutions account significantly for the superior inter-firm relationships in Germany over those in Britain. Similarly, Culnan and Armstrong (1999) found that the existence of an information policy based on fair information practices serves as an intermediary to build trust when customers give out information to strangers. In the case of sustainable products, the existence of institutional support, such as government or NGOs endorsement, encourage users to grant trust. Structural assurance such as contracts, regulations, guarantees and other instruments provide safeguard for users to place their trust on an individual or an organization (Li et al., 2008; Sitkin, 1995). We thus argue that government roles in providing legal protection and acting as information sources as well as NGO roles in endorsing a certification and acting as information provider may have positive influence on the likelihood that consumers form their trusting beliefs (see Fig. 1).

Hypothesis 5. The roles of government as provider of information and provider of legal support protection have positive influence on consumers' formation of trusting beliefs.

Hypothesis 6. The roles of NGOs as provider of information andendorser of a certification have positive influence on consumers' formation of trusting beliefs.

Finally, some studies empirically validate the cross-cultural effect of these antecedents of trust (Jarvenpaa et al., 1999). These studies argue that different cultures influence the perception and formation of trust differently (Gefen et al., 2008). Thus, we used prior knowledge of certification, country of origin, gender and education level as control variables.

3. Research methodology

In this section of the paper, we introduce the methods and procedures followed to test the hypotheses introduced in the previous section.

3.1. Data collection

We sought to assess the empirical relationships between 6 factors as independent variables and 4 control variables and the dependent variables in the form of trusting belief on sustainability claim. A survey was distributed to students enrolled in a private university in Mexico and a private university in the United States in September 2013 and a total of 178 responses were received. To provide some context for the research, a decision-making assignment was distributed among all students before answering the survey. The survey instrument was developed initially in English, and revised by a panel of experts. It was applied in English and Spanish. The questionnaire was first translated to Spanish by a group of research assistants, and then it was translated back into English by two of the authors of the study to verify the accuracy of the translation.

After data cleaning, we excluded questionnaires with over 10% missing values. Ten participants omit answering very few questions, and we substituted the missing values by the mean value of the missing item. At last, 167 observations were used for our analyses. Table 1 shows the demographic distribution of the sample. Respondents were predominantly male (56.89%), and undergraduate students (85.03%). In terms of the country of origin, 50.90% of the respondents were from Mexico, 28.14% were from United States and the rest (20.96%) were from thirteen other countries in Europe and South and East Asia. In addition, a large percentage of respondents were conscious about health issues (76%) as well as sustainability issues (45%) in their purchasing decisions. This percentage is consistent with results from a recent study by Nielsen, which found that 42% of global online consumers in North America acclaim that they are willing to buy products that delivers social and environmental benefits (Nielsen Global Survey, 2014).
3.2. Variable development and measurement

All measurements used in this study were adapted from previous literature and adjusted to fit the purpose and context of our study. Table 2 shows construct definitions, number of items measured and reliability measures. In terms of the internal reliability estimation, we used Cronbach’s α for all constructs.

3.2.1. Dependent variables

**Trust beliefs** consists of three sub-variables: competence, integrity and benevolence. Competence measures the degree by which consumers believe that sustainable product labels include reliable and valid information that is appropriate for making purchase decisions. Benevolence measures the degree by which a consumer believes that sustainable claim depicted in product label reflects the disposition of such claim to do something good and serve for the interests of consumers. Integrity measures the degree by which a consumer believes that sustainable claim depicted in product package and label reflects truthfulness, honesty and other integrity values.

Since the dependent variable consists of three components, each of the hypotheses was tested for each component of the dependent variable. For example Hypothesis 1 was tested three times as such:

Hypothesis 1a. Disposition to trust in information supplied in product labels and packaging label positively influences consumers' formation of competence belief.

Hypothesis 1b. Disposition to trust in information supplied in product labels and packaging label positively influences consumers' formation of benevolence belief.

Hypothesis 1c. Disposition to trust in information supplied in product labels and packaging label positively influences consumers' formation of integrity belief.

3.2.2. Independent variables

There are six independent variables of interest in this paper and four control variables with description as follows.

- **Disposition to trust label.** This variable measures the tendency of respondents to trust information provided by sustainable claim regardless of other reasons.
- **Brand and company reputation.** This variable measures the importance of information about product brand and company’s reputation for consumers.
- **Certification reputation.** This variable measures the importance of reputation of the sustainable certification scheme for consumers.
- **Additional information to verify label.** This variable measures to what extent the existence of additional information to verify label is important for consumers.
- **Government endorsement.** This variable measures the importance of endorsement by government in terms of legal and regulatory support and information source for consumers.
- **NGOs based-label.** This variable measures the importance of label supported or developed by NGOs for consumers.
- **Prior knowledge of label.** This is a control variable measuring the extent of respondents prior knowledge of sustainable certification and labeling practices in general.
- **Country.** This is a control variable indicating the country of birth of the respondent. We divided the country into three—US-born respondents, Mexican-born respondents and other-countries born respondents.

In addition, in order to ensure the differences were not caused by gender and education level (graduate vs. undergraduate) of the sample, we use gender and level of education also as control variables.

3.3. Analysis technique

Hierarchical multiple regression analysis was used to analyze the relationships among constructs in our research model. We regressed a set of antecedents of trust against the main dependent variables—trusting beliefs of competence, benevolence and integrity.
Table 2
Construct definitions and items measured.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Definitions of this study</th>
<th>No. of items</th>
<th>References</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence (COM)</td>
<td>Information depicted in product labels is capable of guiding consumers to make purchasing decisions</td>
<td>4</td>
<td>Porter and Donthu (2008)</td>
<td>0.76</td>
</tr>
<tr>
<td>Benevolence (BENE)</td>
<td>Information depicted in product labels reflects the consideration of welfare and interests of consumers</td>
<td>3</td>
<td>Porter and Donthu (2008)</td>
<td>0.72</td>
</tr>
<tr>
<td>Integrity (INT)</td>
<td>Information depicted in product label reflects truthfulness, honesty and upholding of other ethical values</td>
<td>3</td>
<td>Porter and Donthu (2008)</td>
<td>0.79</td>
</tr>
<tr>
<td>Independent variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand and company reputation (BACR)</td>
<td>The importance of product brand and company’s reputation</td>
<td>2</td>
<td>Grabner-Kraeuter and Kaluscha (2003), De Pelsmacker, Driesen, and Rayp (2005)</td>
<td>0.80</td>
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<tr>
<td>Certification reputation (CR)</td>
<td>The importance of reputation of the sustainable certification scheme</td>
<td>3</td>
<td>Jiang et al. (2008), Jansang et al. (2007), Grabner-Kraeuter and Kaluscha (2003)</td>
<td>0.54</td>
</tr>
<tr>
<td>Additional information to verify label (AI)</td>
<td>The importance of additional information to verify label</td>
<td>2</td>
<td>McKnight, Choudhury, and Kaemar (2002), Vance, Elie-Dit-Cosaque, and Straub (2008); Li et al. (2008), McKnight et al. (2002)</td>
<td>0.60</td>
</tr>
<tr>
<td>Government endorsement (GE)</td>
<td>The importance of government endorsement in terms of legal and regulatory system and information source</td>
<td>2</td>
<td></td>
<td>0.68</td>
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<tr>
<td>NGO based label (NGO)</td>
<td>The importance of label supported or developed by NGOs</td>
<td>2</td>
<td>Michaelidou &amp; Hassan (2010)</td>
<td>0.71</td>
</tr>
<tr>
<td>Disposition to trust label (DTT)</td>
<td>The tendency of respondents to trust information provided by sustainable certification scheme regardless of other reasons</td>
<td>3</td>
<td>Gfen (2006), Jiang, Jones, and Javie (2008)</td>
<td>0.79</td>
</tr>
<tr>
<td>Control variable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Knowledge (PR)</td>
<td>The extent of respondents’ prior knowledge of sustainable certification and labelling practices in general</td>
<td>3</td>
<td>Gleim et al. (2013)</td>
<td>0.83</td>
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<td>Country (COU)</td>
<td>The country of birth of the respondent</td>
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<tr>
<td>Gender (GEN)</td>
<td>The gender of the respondent</td>
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<td>N/A</td>
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<td>Education level (EDU)</td>
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<td>N/A</td>
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</table>

4. Results and findings

In this section of the paper, we start by documenting the validity of the measurements. We continue then with the presentation of the results from regression analysis.

4.1. Validity and reliability analysis

To verify discriminant and convergent validity, we performed principal component analysis to items belonging to all constructs. We verified that items loaded high on their corresponding constructs. Table 2 shows the constructs, sources, number of items and internal reliability of the scales used in the study. The reliability estimates (Cronbach’s alphas) for all constructs falls within acceptable ranges ≥.70, except for variables certification reputation, additional information to verify label and government endorsement. These variables have scores of .54, .60 and .68 respectively. Although these values may be considered low, some authors such as Nunnally (1970) explain that values of Cronbach’s alphas lower than .7 may be considered acceptable depending on how the measure is used. In this case, we decided to keep the measures because studies like this may be considered to be in an exploratory stage and because the measures have a good face and content validity.

4.2. Hierarchical regression analysis

This study postulates causal effects among various factors that influenced consumers’ trust on information contained in a product’s label and package that refers to sustainable practices. We tested three models evaluating the determinants of consumer’s trust belief of competence, benevolence and integrity. Each of these models was tested twice, with and without the control variables (prior knowledge of label, country, gender, and education level). We tested all the hypotheses by using hierarchical regression analysis. The constructs of the independent variables were mean centered to avoid the potential of multicollinearity problems during regression (Aiken and West, 1991). In order to examine the hypothesized main effects, a two-tailed test was used to ensure the significance of the standardized coefficients.

Control variables were entered in the first step of regression and the independent constructs were added in the second step. All independent constructs were assessed simultaneously so that their effects could be seen in the context of the overall model. Table 3 shows that the variables...
were significantly correlated, and Table 4 presents the regression results for the three sets of models.

Model 1 and Model 2 estimated the relationships between antecedents and competence trusting beliefs. Model 2’s F test value is significant at 0.05 level, and R² value of is 0.40. Following Falk and Miller (1992)’s suggestion that the explanatory power (R² value) greater than 10% is acceptable. The results indicate that the conceptual model was more than satisfactory in explaining the formation of competence trusting belief. The change in R² value between the two steps of regression was 0.32 (p < 0.001), indicating that the outcome of model 2 could be interpreted. In terms of β values, disposition to trust, certification reputation and government endorsement have positive and significant effects on competence trusting belief. Therefore, our results supported H1a, H3a and H5a.

Model 3 and model 4 tested the relationships between antecedents and benevolence trusting beliefs. The results shows that disposition to trust, brand and company reputation, certification reputation and NGO based label have positive and significant effects on the development of benevolence trusting belief. H1b, H2b, H3b and H6b were supported. According to the R² value of model 4 (R² = 0.41, F = 10.90, p < 0.001), this model has a good explanatory power.

Similarly, model 5 and model 6 verified the relationships between antecedents and integrity of trusting beliefs. Based on regression coefficients in model 6, we stated that disposition to trust, brand and company reputation, certification reputation and NGO based label are significantly positive related to integrity trusting beliefs. Hypotheses H1c, H2c, H3c and H6c in our conceptual model are supported. These four variables explained 36% of the variance (R² = 0.36, F = 8.84, p < 0.001).

Finally, we included the Variance Inflation Factor (VIF) option in our regression analysis to explore the extent of multi-collinearity in our results. VIF is the degree to which the standard error has been increased because of multi-collinearity. The higher the score, the more difficult it is to show that the coefficient is significantly different from zero. As can be seen in Table 4, all of the VIF values indicate a lack of multi-collinearity in our results (Hair et al., 2006).

5. Discussion and conclusions

In summary, as shown in Table 4, disposition to trust product label and packaging information emerge consistently as significant predictors to induce trust in sustainable practices claimed by a product’s label. Brand and company reputation emerges as a significant predictor to induce consumer’s trust regarding the benevolence and integrity of a product label. The significance of the impact of certification reputation on trusting beliefs is fairly consistent across the models. Results presented in Table 4 also indicate that additional information to verify label does not emerge as significant predictor to induce trust for all three models. In addition, government support in terms of providing legal protection for consumer from falsification or fraud from irresponsible brand holders or certification schemes emerge as significant predictor to induce competence trusting belief, whereas endorsement by NGOs in supporting the development of standards significantly influence the formation of consumers’ trusting belief on benevolence and integrity of product labels.

The finding that consumer’s disposition to trust determines their trusting beliefs on information about sustainable practices depicted in product package and/or label is expected. Consistent with previous studies (Gefen, 2000; Mayer et al., 1995; Ridings et al., 2002), consumers with higher disposition to trust have greater level of propensity to trust the information about sustainable practices presented in product packaging or eco-label.

Reputation of the brand holder as well as reputation of the certification schemes influences consumer’s trusting beliefs on information about sustainable practices available in product packaging and label. Concurring to previous studies, consumers use reputation as cognitive trusting base to infer trust of a trustee qua certification and brand holders (Li et al., 2008; McKnight et al., 1998; Sarker, Valkitchen, & Sarker, 2003). This might be particularly important when direct and/or initial experiential information is unavailable as it is the case in our sample (Li et al., 2008). However, in contrast to previous studies (Li et al., 2008; Powell, 1996), we found that brand holder reputation is not a significant predictor for trusting beliefs about the trustee competence. This may imply that the set of tools and infrastructure to deliver the sustainable products information are different from those for traditional products, and consumers are most interested in competence of the external certifiers who have a chance to look into the internal processes of the handling. In the case of sustainable products, a strong brand reputation might carry with it the general image of benevolence and integrity of the brand holder, however, it may lack the strength to signal equal effectively that the sustainability information provided is complete, valid and reliable. In another word, consumer may feel more vulnerable for being cheated to pay a higher price for products that are of non-distinguishing qualities or does not deliver the value

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* p < .05.  ** p < .01.  *** p < .001.
and benefits as claimed. They may suspect that producers could easily falsify information and the falsification efforts could not be reliably caught and penalized. The lack of willingness to trust based on brand image, might in turn, set disincentives for brand holders to pursue quality controls as a way to strengthen their competitive advantages, further exacerbating the growth of consumer confidence and trust. We consider this an interesting finding of this study. It provides further evidence for the difficulties of created by potemkin attributes of those value-based products, such as organic and fair-trade products. As sustainability claims can be made with very little risks of disclosure and refutation, consumers, NGOs, and public authorities are in a weak position to deter opportunistic behavior (Gabrielle et al., 2005). Therefore, to foster consumer trust and the expansion of sustainability consumption, our study highlight the importance of establishing institutional structure to monitor the entire supply chain and ensure the transparency and information traceability throughout production and processing.

This conclusion, however, seems to contradict our finding that consumers do not care about more information from the supply chain that can trace inspection details. Initially, we posit that consumers need more information, in addition to reputation, to form the cognitive trusting base and infer trust about trustee's competence, benevolence, and integrity. This information may include information from the certifier, as well as the application of processes and standards for certification. Our original postulation is based on the literature that discuss the difficulties in understanding product performance as a barrier for purchasing sustainable products (Gleim et al., 2013; Marian & Thøgersen, 2013; Thøgersen & Schrader, 2012), and raising interests of consumer in acquiring more information to verify company's sustainabil-ity practices (Collins et al., 2007; Locke & Romis, 2007; Locke et al., 2007). This results nevertheless, confirms the limitation of such assumption. On one hand, consumers might be interested in being informed, and on the other hand, they may not know what to do with the additional information in a world that is already overloaded with information and data. This result is consistent with the literature regarding information overload and smart disclosure (McKnight & Chervany, 2002; Vance et al., 2008; Wilson & Clarke, 1998). That is to say, increasing the availability of information to verify and trace claim is not sufficient or even useful for end-consumers. Additional information is perhaps only useful for power users such as a consumer advocates, consumer protection agencies, or news media, given that end-consumers often have limited time and purchasing decision making is a complex endeavor (Park, Iyer, & Smith, 1989). As introduced in the literature review, we make the interpretation that end-consumers might prefer simple forms of information for purchase decisions. Therefore, findings in this paper suggest that the success of smart disclosure initiatives require the development of an information eco-system, in which government, NGOs, media, or private entities can serve as information intermediaries that aggregate, process, present, and make sense out of relevant data for consumers. Interesting enough, as Horne (2009) put it, we could have “too much information” while at the same time “a paucity of independent, accessible, readily accessible and understandable information about environmental performance” of various eco-labels (Horne, 2009). This situation may be alleviated by smart disclosure initiatives, but the success is not guaranteed and the information provided needs to deliver values to the end consumers.

Finally, the results suggest that support from the government and endorsement from non-for-profit organizations significantly influence consumer’s trusting beliefs on sustainable claims. In a sense, we can think about these two endorsements as components of the institutional structure needed to monitor the supply chain introduced in previous paragraphs. Valuable government support in the form of legal instruments to protect consumers from falsification and forgery of claim significantly influence consumer’s trusting beliefs on information (Ba, 2001). Consumers also place higher trust on certification endorsed by NGOs. Previous studies argue that solid NGOs based certification is central in establishing and maintaining the legitimacy of certification schemes (Raymonds, Murray, & Heller, 2007), which in turn could induce trust. This is an important finding that has both theoretical and policy implications. First, this is one of the first studies that integrate the concepts of trust in information, sustainable consumption and smart disclosure. Our study contributes to the understanding of the mechanism of trust production based on institutional factors in sustainable consumption, and particularly, government roles in fostering trust in the market-place in the context of smart disclosure. The existence of structural assurance in the form of legal system ease the way for risk taking and trust development because the breach of confidence is less expected (Rousseau, 1998). As such, it appears that consumers prefer government-regulated or NGO-sponsored labels. Moreover, our results suggest that these different types of institutions are contributing in different, but complementary ways to trusting beliefs. Nonetheless, given that our study is the first approximation to this phenomenon, further exploration of these relationships is needed.

Institutional factors, however, can also hinder the development of trust, if they create rigidity in resolving conflicts (Sitkin & Roth, 1993; Sitkin, Stickel, Kramer, & Tyler, 1996). In other areas, such as environmental regulation, policy initiatives to publish toxic release information has been seen as effective in creating a flexible and self-regulating framework, as it gives investors, consumers, journalists and environmental groups an unprecedented access to environmental data about firms (Khanha, Quimo, & Bojjolva, 1998). The response from financial markets was cost-effective in sending signals to firms to invest in toxic emissions reduction. In the area of sustainable consumption, however, our research suggests that government’s soft measure in disclosing information is not sufficient, without the hard regulation on product standard and certification process and third-party certification mechanisms. One the one hand, consumer perceived greater level of trust when a product label and certification is backed by legal framework because opportunistic behaviors, such as falsification or forgery, would be prohibited and punished. On the other hand, the finding might indicate that standardization through regulation makes the labels easier for consumer to understand, and reduces the cost of monitoring and enforcement in a market with high level of information asymmetry (McCluskey, 2000). This is evident in organic foods market, in which USDA regulation boosted consumer confidence and facilitated the growth of this market (Dimitri & Greene, 2000). A reasonable policy recommendation, therefore, would be for government to strengthen the standard setting and monitoring efforts for sustainable products. Critics of such national or international standardization approach, however, argue that the major weakness of standardization is the lack of flexibility and inertia to innovate (Horne, 2009). After all, many eco-labels are created to fulfill the different interests and values of many stakeholder groups, such as fair-trade vs. dolphin friendly. It may not be reasonable to regulate such diverse markets as though there is only one or two sets of shared value across populations. Nevertheless, with the increasing use of information technology, there might be opportunities for harmonizing different standards or co-regulation, in which industries and government set standards collaboratively and use information traceability and transparency as a policy tool for monitoring and enforcing standards compliance.

This last finding might also point to the existence of interaction between the cognitive-based factors and institutional factors. Future study might be benefited from a perspective that government regulation reduces the information complexity and enhances the effectiveness of information processing and absorption, thus making the impact of information on brand reputation, certification reputations and processing processes stronger. One limitation of the study is the low reliability scores for the certification reputation and additional information to verify label variables, future research may need to focus on developing more robust scales to measure these variables. Another limitation to mention is the use of convenient sample—students from the US and Mexico as respondents for this study limit the generalizability of the findings. As such, the findings of this study should be interpreted as an
understanding of consumers trust from the perspective of US and Mexico. Future research could attest and apply the construct and model to other countries with more diverse consumer populations. Such comparison will add to the generalizability of the findings. Finally, better distinctions of the role of different institutions such as government and NGOs needs to be further explored.

In conclusion, current heightened attention to the issue of open data, private sector transparency and smart disclosure necessitate an understanding about what information induces consumers’ trust. In this paper, we emphasize that an understanding of consumer reactions to various elements of information regarding product and certification as the basis to building trust is crucial for the adoption and usage of smart disclosure tools that make use of such information. We highlighted the importance of institutional mechanisms as the basis for building consumer trust, and such understanding is important for policy maker in deploying information as a policy instrument regulating sustainable markets. Such understanding is also helpful for data owners, data publishers and smart disclosure tool developers to ensure that data and applications being developed and published are indeed useful to users/consumers. Brand names and certificates are important elements to consider when creating trust on the consumer, but there is other information relevant to creating trust, particularly that related to the government support and standards, and sanctions, or current practices and procedures of certification carried out by NGOs. Transforming and delivering this information in a simple and credible way to consumers imposes a challenge for developers and data owners.

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References


Nielsen Global Survey (2014). Global Consumers are willing to put their money where their heart is when it comes to goods and services from companies committed to social responsibility. From http://www.nielsen.com/us/en/press-room/2014/global-consumers-are-willing-to-put-their-money-where-their-heart-is.html


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