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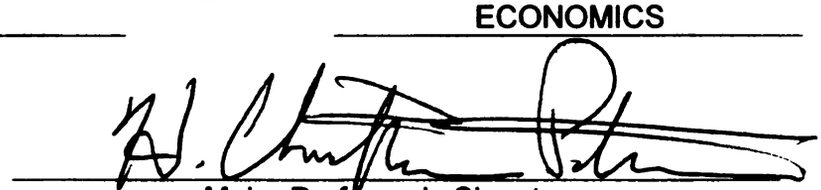
BRANDING AGRI-FOOD PRODUCTS WITH CREDENCE ATTRIBUTES

presented by

DOMENICO DENTONI

has been accepted towards fulfillment
of the requirements for the

PHD degree in AGRICULTURAL ECONOMICS



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12/17/2009

Date

BRANDING AGRI-FOOD PRODUCTS WITH CREDENCE ATTRIBUTES

By

Domenico Dentoni

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Agricultural Economics

2009

ABSTRACT

BRANDING AGRI-FOOD PRODUCTS WITH CREDENCE ATTRIBUTES

By

Domenico Dentoni

This study attempts to advance knowledge on how a firm can create value for customers and pursue a benefit advantage strategy by adding credence attributes to its products. Credence attributes are product features that consumers cannot verify before, during or after consumption, but still can perceive and value. In global agri-food markets, "locally-grown", "place-of-origin", "animal welfare", "organic", "eco-friendly", "safe", "natural" are examples of credence attributes that consumer segments across the world increasingly value when making their product and consumption choices. Given the unique nature of credence attributes, analyzing how consumers build their perceptions and values for products with credence attributes is of paramount importance for the firm pursuing such a benefit advantage strategy. So far, a rich research strand in agricultural economics has built upon consumer demand theory to analyze how adding credence attributes changes consumers' evaluations of generic agri-food products and the conditions under which such an effect takes place.

In an attempt to integrate this research strand from agricultural economics, this study builds upon the theory of attitude formation, developed in psychology and largely

applied to marketing, to understand how a firm can provide credence attribute information to consumers differentiating its own individual brand from competitors. The theory of attitude formation postulates that individuals not only develop evaluations for attributes, but also form beliefs that these attributes are associated to objects and that ultimately they create their attitudes and behavioral intentions based upon both attribute evaluations and beliefs.

The three essays of this study provide the initial point towards building a theory of branding products with credence attributes, which aims at understanding which credence attribute information can differentiate a brand from its competitors and so allow a firm to gain a benefit advantage. By analyzing the case of Michigan locally-grown apples, the first essay starts exploring why consumers prefer products with credence attributes and what is the direct and indirect effect of credence attributes. By tackling the case of Liguria extra-virgin olive oil and of Southern Louisiana cream cheese, the second essay starts exploring under which conditions generic credence attribute information and brand information provide an advantage to an individual brand in terms of consumers' attitudes and willingness-to-pay (WTP). By studying the case of fast food restaurants and poultry welfare practices, the third essay starts exploring which positive brand information can effectively mitigate the negative effect of an information shock relative to a credence attribute. Data were collected from a series of on-line experiments on college students and from US residents. Data analysis involved path modeling and structural equation modeling, which provide the advantage of analyzing moderators and mediators of the effect of credence attributes information on consumer WTP.

A Mamma, a Papa', a Nonna, e a Claudia

ACKNOLEDGEMENTS

This dissertation is dedicated to my Mum and to my Dad, who made me always grow in a happy, calm and enthusiastic environment and who give me full moral and practical support in every choice I make. I hope you will enjoy this big book as my Christmas gift this year. It is dedicated to my Grandma, who taught me how to serve the others with joy through her example and experience. I look forward to translating this sentence to you next week, possibly after eating a dish of your fantastic pasta. It is dedicated to Claudia, who gave me her unconditioned love for such a long time and the motivation of getting my studies done every semester to run back home, as soon as my exams were over, and hug her. Today I feel very incomplete without you, but I hope that tomorrow we can realize our dreams together.

If I said thank you to every person deserving it, I would probably need to write two hundred more pages and make this volume extremely heavy. Yet there are people that really deserve a special mention. Thank you to my Major Professor, Dr. Chris Peterson, for driving me consistently across this research work, for giving me trust and freedom of exploring new disciplines whenever I felt it was important, and for providing generous funding. Thank you to Dr. Glynn Tonsor for being an excellent guide and for giving me an invaluable example that I will try to follow in my future career. Thank you to Dr. Hamish Gow and to Dr. Tom Reardon for being an amazing source of inspiration

and enthusiasm: I feel I have recorded in my brain every word you told me during these years. Thank you to Dr. Roger Calantone for giving me the opportunity of gaining a doctoral-level education in marketing and structural equation modeling within the MSU Eli Broad Business School, along with generous funding and with a humor that probably has Italian origins. I really hope that, outside my dissertation, I can keep working together with all of you as we did so far.

I would like to thank also the participants and reviewers of the IAMA, SMS, EAAE, IAAE and NEC-63/AAEA conferences. By interacting with you, I received great feedback and developed many ideas. Thank you to Dr. Scott Loveridge and Dr. Steve Hanson for their generous conference funding and thank you Debbie, Ann and Nancy for processing all my paperwork with great efficiency and kindness. Thank you to all my colleagues in the Department and special thanks to Byron, Nicole and Nicky. Without your patient help, I would have left my program probably after two weeks of classes, and certainly after two sessions of prelims. Thanks also to Adam, Alex and Ross: together we have built an agribusiness student mafia that is both fun and effective.

Thank you to all the international friends I have lived and partied with during these three years. Together we really enjoyed our lives. I would also like to acknowledge the people at Chipotle, Espresso Royale and the Post for providing food, coffee and music for thought and the daily energy to deal with all the challenges of a PhD life.

Finally, thank you to many people in Italy, which is my home. Thanks to my Italian friends and relatives, who always encourage me and wait for me when I am around the world and are also able to stand me once I am back home for more than one

week. Thanks to the Italian olive oil producers and to all the people of goodwill that I met during my researches. Together we will build a much better country.

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KEY TO SYMBOLS AND ABBREVIATIONS

CFI	Comparative Fit Index
CSR	Corporate Social Responsibility
d.f.	Degrees of freedom
EU	European Union
LGM	Latent Growth Model
LM	Lagrange Multiplier
MSU	Michigan State University
NGO	Non-Governmental Organization
PETA	People for Ethical Treatment of Animals
POO	Place-of-Origin
RMSEA	Root Mean-Square Error of Approximation
US	United States
WTP	Willingness-to-Pay
WTPP	Willingness-to-Pay a Premium Price

INTRODUCTION

A fundamental question of agribusiness strategy and management is how a firm creates value relative to competitors (Stewart, 1991) and ultimately gains a competitive advantage (Porter, 1985). To this purpose, the firm can undertake a benefit advantage strategy, which has the objective of creating more benefit to customers relative to its competitors (Besanko et al., 1996).

This research work is designed to advance knowledge on how a firm can pursue a benefit advantage strategy by adding credence attributes to its products. Credence attributes are product features that consumers cannot verify either before, during or after consumption, but still can perceive and value (Darby and Karni, 1973). In global agri-food markets, "locally-grown", "place-of-origin", "animal welfare", "organic", "eco-friendly", "safe", "natural" are examples of credence attributes that consumer segments across the world increasingly values when making their product and consumption choices (e.g., Nimon and Beghin, 1999; Loureiro and Umberger, 2007; Basu and Hicks, 2008; Darby et al., 2008; Kanter et al., 2008; Frolich et al., 2009). Credence attributes also create customer value for non-agricultural products, such as safety for surgery services, eco-friendliness for cars, or place-of-origin for fashion articles (Darby and Karni, 1973).

Given the unique nature of credence attributes, analyzing how consumers build their perceptions and values for products with credence attributes is of paramount importance for any firm pursuing such a benefit advantage strategy.

To fully understand how consumers perceive and give value to products with credence attributes, research needs to take into consideration both economics and psychology theory. Consumer demand theory investigates what is the marginal value increase consumers have when a certain attribute is added to a product (Lancaster, 1966). Consumer psychology investigates how individuals process and use information about a product, build their beliefs and attitudes towards it, and form their buying intentions and actions (Fishbein, 1967; Fishbein and Ajzen, 1975; Lutz, 1991).

So far, a rich research strand in agricultural economics has built upon consumer demand theory to analyze how adding credence attributes changes consumers' evaluation for generic agri-food products and the conditions under which such an effect takes place (e.g., Thompson, 1998; Nimon and Beghin, 1999; Baker and Burnham, 2001; Van der Lans et al., 2001; Loureiro et al., 2002; Alfnes and Rickertsen, 2003; Lusk, Roosen and Fox, 2003; De Pelsmacker et al, 2005; Loureiro and Umberger, 2007; Basu and Hicks, 2008; Darby et al., 2008; Ehmke et al., 2008; Kanter et al., 2008; Froelich et al., 2009). However, this research does not provide a complete answer to how a firm should use credence attributes to differentiate its own individual products, which are often distinguished from other firms' products by a brand (Aaker, 1991; Keller, 1993), and so obtain a benefit advantage relative to competitors.

In an attempt to integrate this research strand from agricultural economics, this research builds upon consumer psychology theory to understand how a firm can provide

credence attribute information to consumers that differentiates its own individual brand from competitors. Specifically, the theory of attitude formation (Fishbein, 1967; Fishbein and Ajzen, 1975; Lutz, 1991) provides the theoretical framework accompanying the three essays that compose this research. The theory of attitude formation postulates that individuals not only develop evaluations for attributes, but also form beliefs that these attributes are associated to objects and that ultimately they create their attitudes and behavioral intentions based upon both attribute evaluations and beliefs (Fishbein, 1967; Fishbein and Ajzen, 1975).

The three essays of this research provide the initial point towards building a theory of branding products with credence attributes, which aims at understanding which credence attribute information can differentiate a brand from its competitors and so make a firm gain a benefit advantage. In the first essay, the case of Michigan locally-grown apples is used to start exploring why consumers prefer products with credence attributes and what is the impact of credence attribute claims on consumers' beliefs in the presence of other product attributes. In the second essay, the case of Liguria extra-virgin olive oil and of Southern Louisiana cream cheese is used to explore under which conditions generic credence attribute information and brand information provide an advantage to an individual brand in terms of consumers' attitudes and willingness-to-pay (WTP). In the third essay, the case of fast food restaurants and poultry welfare practices is used to explore which positive brand information can effectively mitigate the negative effect of an information shock relative to a credence attribute.

A multi-variate analysis approach is adopted to tackle the research questions of the three essays. Specifically, the three studies are designed with structural equation

modeling, path modeling and latent growth modeling (Duncan et al., 1999; Hair et al., 2006). These models share two key features. First, they provide a means to assess a set of relationships simultaneously rather than in separate analyses (Hair et al., 2006). Second, as a set of relationships can be assessed simultaneously, they also give the opportunity of exploring the mediators and the moderators playing a role in explaining the impact of an independent variable on a dependent variable (Kaplan, 2009).

Bringing these two features of multi-variate analysis to the ground of agri-food marketing is crucial and timely. Most of the analysis conducted so far in this field explored the impact of an independent variable, such as a credence claim, on a dependent variable, such as consumer WTP (e.g, Nimon and Beghin, 1999; Alfnes and Rickertsen, 2003; Lusk et al., 2003; Darby et al., 2008; Ehmke et al., 2008; Kanter et al., 2008; Froelich et al., 2009). By using multi-variate techniques, this study integrates the extant literature by exploring *why* and *under which conditions* a credence claim has an impact on consumer WTP. Specifically, to explore *why* a credence claim has an impact on consumer WTP, multi-variate techniques give the opportunity of analyzing the role of consumers' beliefs and attitudes as mediators of this relationship. To explore under which conditions a credence claim has an impact on consumer WTP, multi-variate techniques give the opportunity of analyzing the role of consumers characteristics and information characteristics as moderators of the relationships between credence claims and beliefs, between beliefs and attitudes, and between attitudes and WTP. Overall, applying multi-variate techniques to the context of agri-food marketing provides the opportunity of expanding knowledge on how consumers change their food perceptions and values, and ultimately how they make their food buying and consumption decisions. Therefore, in a

market where firms are increasingly pushed to be consumer-responsive to develop a benefit advantage, tackling research questions with multi-variate techniques provides key response to the needs of marketing managers.

Data from students at Michigan State University and from US residents provided the empirical evidence for tackling the research questions of the first two essays and of the third essay, respectively. If the product is relevant to the sample, collecting data from a population of students provides an ideal setting to test theory, because a quite homogeneous group of respondents provides information in a controlled environment without the "real-world" noise that the researcher cannot control (Calder et al., 1981; Lynch, 1999; Winer, 1999). On the other hand, collecting data from a representative population of US residents gives the opportunity of understanding how a research question, tackled with a multi-variate analysis approach, can be of practical use for marketing managers.

Data were collected with a series of on-line experiments between November 2008 and November 2009. Given their comparatively low costs and fast completion times, on-line surveys are increasingly used by researchers (Hu et al., 2006; Louviere, 2008; Gao and Schroeder, 2009). Researchers found that similar results are found from applying on-line surveys, in-person interviews and conventional mail surveys (Marta-Pedroso et al., 2007; Fleming and Bowden, 2009). Moreover, Hudson et al. (2004) provided evidence that on-line surveys do not have non-response bias.

The following chapters of this dissertation are organized as follows. The first essay on the direct and indirect effects of "locally-grown" on consumers' attitudes towards apples is presented in chapter one, followed by a reproduction of the survey

instrument in the appendix. The second essay on building individual brands with place-of-origin information constitutes chapter two, and appendices with a copy of the survey instrument, other treatments and a methodological note follow. Chapter three presents the third essay on brand information mitigating the negative impact of information shocks on animal welfare and is followed by appendices with a copy of the survey instrument, other treatments and a methodological note. Conclusions are finally drawn in the last chapter.

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Chapter 1

THE DIRECT AND INDIRECT EFFECT OF "LOCALLY-GROWN" ON CONSUMERS' ATTITUDES TOWARDS AGRI-FOOD PRODUCTS

Growing segments of world consumers seek improved quality, healthiness and variety in their food (e.g., Verbeke, 2005; IDDBA, 2008). Accordingly, demand of agri-food products with credence attributes (e.g., place-of-origin, organic, locally-grown, environment-friendly and fair trade) is increasing rapidly (e.g., Nimon and Beghin, 1999; Loureiro and Umberger, 2007; Basu and Hicks, 2008; Darby et al., 2008; Kanter et al., 2008; Frolich et al., 2009). This growing consumer demand has resulted in a large literature studying a range of issues with credence attributes. Many studies suggest credence attributes have an impact on some consumer groups' buying intentions, and specifically on the amount they are willing to pay for possessing products. However, examining *why* consumers are willing to pay a premium price for credence attributes is notably less prevalent in the literature. For example, Lusk et al. (2006) recognized this in the context of country-of-origin labeling. In this study, we aim to begin filling this gap by analyzing consumers' motivations of buying agri-food products that are "locally-grown". We clarify if consumers are willing to pay a premium for "locally-grown" products

because they value the "locally-grown" attribute itself, or if they mainly value "locally-grown" as a signal of other desirable product attributes, such as freshness or its environmental-friendliness.

To disentangle consumers' motivations for buying "locally-grown" products, we propose and test a model that separates the direct effect from the indirect effect of "locally-grown" on consumers' attitudes towards a product. Similarly to the distinction suggested by Van der Lans et al. (2001), we define *direct effect* as the impact of "locally-grown" on consumers' attitudes towards a product, without any mediation. We instead define *indirect effect* as the impact of "locally-grown" on consumers' attitudes towards a product mediated by their belief that other desirable product attributes (e.g., freshness or environmental-friendliness) are present in the product. These product attributes that are inferred from "locally-grown" may be either experience attributes, which are features that can be verified by the consumer after disposal, or other credence attributes. For example, some consumers may value "locally-grown" as a cue of product freshness, which is an experience attribute, or as a cue of environmental-friendliness, which is another credence attribute.

We suggest that, along with "locally-grown", any other credence attribute may have a direct and indirect effect on consumers' attitudes towards a product. For example, some consumers may value the attribute "animal welfare" as a positive cue of desirable "food safety" (which is, according to our definition, an example of an *indirect effect*), while others may value the attribute "animal welfare" itself, because they really care about the welfare of animals (which is an example of a *direct effect*). Similarly, some consumers' may be willing to pay a premium for food "from France" either because they

believe that "from France" is a cue of "good flavor" or because they have a positive reaction associated to the idea of France. Therefore, we suggest that the model applied to "locally-grown" in this paper can be possibly tested also on other credence attributes.

Exploring whether "locally-grown" and other credence attributes have a direct or indirect effect on consumers' attitudes towards a product has important implications for marketers, public agencies and non-governmental organizations. Marketers understanding why potential consumers are willing to pay a premium for credence attributes can make their consumer-targeting strategies more effective. Public agencies and non-governmental organizations aiming at shifting consumer demand and enhancing consumption of products with credence attributes for social welfare reasons could use the model proposed in this paper to assess the effectiveness of their promotion and awareness programs.

The conceptual framework we propose is based upon the theory of attitude formation, developed in psychology (Fishbein, 1967; Fishbein and Ajzen, 1975), adapted to marketing theory (Lutz, 1991) and applied in a wide range of marketing contexts (e.g., Hoffman and Novak, 1996; Huang, 1996; Lee, 2000). Differently from existing economic theories on signaling quality as a unique concept (Akerlof, 1970; Rosenman and Wilson, 1991), the theory of attitude formation enables us to study the problem of signaling individual quality attributes by analyzing the relationships among consumers' beliefs in the presence of product attributes and their attitudes towards a product (Fishbein, 1967). To test our conceptual framework we collected data from 60 students in an experiment regarding "locally-grown" apples. We chose structural equation modeling as the

appropriate methodology to separate the direct from the indirect effect of "locally-grown" on consumers' attitudes towards apples.

The rest of this paper is organized as follows. In the next section, we review the existing literature and propose our conceptual framework. Then, we develop and state our hypotheses. After this, we describe our methods and present our results. In the last section, we draw our conclusions from the results illustrated.

Literature Review

Credence attributes are quality features of a product or service that cannot be verified by consumers neither before purchase nor after trial (Darby and Karni, 1973). Credence attributes have different properties from search and experience attributes, as these are features that consumers can verify before purchase and after purchase respectively, when the product is used (Nelson, 1970). On the other hand, consumers cannot know with certainty if a credence attribute is present within a product or service, as they do not possess the technical expertise to make an assessment. In the context of food products, credence attributes can be either features of the production process (i.e., country of origin or organic practices) or of the chemical structure of a product material (i.e., calorie content or the presence of chemical residues).

Both the agricultural economics and marketing literature have largely examined the impact of several credence attributes on consumers' intentions of buying products and services. Since the 1980s, a vast strand of the marketing literature has focused on the impact of country-of-origin attributes on consumers' evaluation of products (e.g., Peterson and Jolibert, 1995; Verlegh and Steenkamp, 1999; Pharr, 2005). These studies

found that the impact of country-of-origin on consumer evaluations is significant in many circumstances. More recently, the agricultural economics literature has analyzed the impact of several credence attributes, including genetically-modified (e.g., Baker and Burnham, 2001; Lusk et al., 2003), organic (e.g., Thompson, 1998; Kanter et al., 2008), local or locally-grown (e.g., Darby et al., 2008; Froelich et al., 2009), environment-friendly (e.g., Nimon and Beghin, 1999; Loureiro et al., 2002), place-of-origin (e.g., Van der Lans et al., 2001; Alfnes and Rickertsen, 2003; Loureiro and Umberger, 2005 and 2007; Ehmke et al., 2008), fair trade (e.g., De Pelsmacker et al, 2005; Basu and Hicks, 2008) and hormone-free (e.g., Alfnes and Rickertsen, 2003; Kanter et al., 2008) on consumers' willingness-to-pay for agri-food products.

From these studies, researchers have found that the impact of many credence attributes, such as the presence of procedures guaranteeing safety (Schroeder et al., 2007), on consumers' buying intentions has a positive direction. However, they have also found that the impact of other credence attributes, such as "genetically-modified" (Lusk et al., 2001), is sometimes negative. Researchers have often estimated the magnitude of the impact of credence attributes on consumers' willingness-to-pay (e.g., Alfnes and Rickertsen, 2003; Lusk et al., 2003). Furthermore, some researchers has found that credence attributes have a positive impact on consumer's attitude towards a product (e.g., Ericksson et al., 1984), which in turn has a positive effect on consumers' buying intentions (Fishbein and Ajzen, 1975). Finally, researchers have analyzed how the impact of credence attributes on consumers' attitudes and buying intentions vary according to consumers' characteristics, such as their nationality (Tonsor et al., 2005; Basu and Hicks,

2008; Ehmke et al., 2008), level of income (Thompson, 1998; Pharr, 2005) and level of knowledge of the attribute (Baker and Burnham, 2001).

While much research has focused on measuring the magnitude and the direction of the impact of credence attributes on consumers' buying intentions, a question that has not been tackled systematically is *why* do credence attributes have such an impact? One way to frame this broad question is analyzing whether consumers value credence attributes because they are cues of other desirable attributes or because they are desirable on their own. In order to analyze this specific question, we propose a conceptual framework that builds upon the learning theory of attitude formation (Fishbein, 1967).

Consumers' Beliefs and Consumers' Attitudes towards a Product

There is a broad strand of the literature in consumer psychology analyzing the relationship among consumers' beliefs in the presence of product attributes to their attitudes towards a product and their willingness to pay for it (Fishbein, 1967; Fishbein and Ajzen, 1975; Ajzen, 1991; Eagly and Chaiken, 1993; Ajzen, 2005). Specifically, the learning theory of attitude formation elaborated by Fishbein (1967) establishes the relationship between a person's beliefs in the presence of individual attributes of an object and his overall attitude towards that object. An attitude towards an object is defined as a "psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly and Chaiken, 1993). There is large evidence that a person's attitude towards an object is positively associated with actions involving that object, even if there are social and personal factors that might weaken or eliminate this relationship (Fishbein and Ajzen, 1980; McFadden, 1986).

In particular, the learning theory states that a person's attitude towards an object is the sum of his evaluative judgments for each attribute of the object times a consumer's belief strength that each attribute is actually in place. In formula, the attitude towards an object is given by:

$$\text{Attitude (Object)} = \sum^{n}_{i=1} e_i b_i \qquad (1)$$

where i is an attribute of an object, n is the total number of attributes of the object, e_i is a person's evaluative judgment for the attribute i and b_i is a person's belief strength that attribute i is actually in place in the object. Both ei and bi can be thought as a scale of values, rather than a yes/no value. A person's evaluative judgment for an attribute represents how much he cares about the presence of that attribute, while a person's belief strength represents how much he believes that that attribute is actually present within that object.

The learning theory of attitude formation has borrowed itself to marketing theory (Lutz, 1991) and has found application in a wide range marketing contexts (e.g., Hoffman and Novak, 1996; Huang, 1996; Lee, 2000). Consumers build their attitudes towards a product upon their own beliefs and evaluative judgments for each attribute of that product. Then, consumers make their buying decisions by comparing their attitudes towards competing products and by taking into account other personal and social factors that might influence their decision (Fishbein and Ajzen, 1980). From this perspective, marketing communication strategies have the goal of making consumers' attitudes for their product higher than their attitudes towards competing products (Lutz, 1991). To do that, marketers have to decide whether they aim at changing consumers' evaluative

judgment for specific attributes or at changing their beliefs that a specific attribute is in place. To make this fundamental choice, it is crucial that marketers have an understanding of how their own product attributes are perceived by consumers differently from their competition.

Direct and Indirect Effect of Credence Attributes on Consumers' Attitudes

The impact of product attributes as signals, or cues, of consumers' perceptions of quality has been an important field of research in consumer psychology. Consumers use attributes as cues when information is incomplete or difficult to obtain (Olson, 1978; Ericksson et al., 1984; Han and Terpstra, 1988; Rao and Monroe, 1989; Kirmani and Rao, 2000). In this study, we hypothesize that credence attributes have an impact on consumers' attitudes also because they are used as a cue of desirable experience attributes and other credence attributes.

Some research on the use of the credence attribute country-of-origin as a cue of other attributes has been already conducted in marketing literature, while comparatively little work in this area has been done in the agri-food marketing field (Lusk et al., 2006), with few exceptions (Umberger et al. 2003; Loureiro and Umberger, 2005). There is evidence that the country-of-origin associated to a product has an important function in increasing consumer's beliefs in the presence of other experience attributes (e.g., Ericksson et al., 1984; Han and Terpstra, 1988; Hong and Wyer, 1989). For example, US consumers considered TVs made in Japan more technologically advanced than domestic TVs (e.g., Han and Terpstra, 1988). The effect of place of origin as a cue of other attributes has been defined by Van der Lans et al. (2001) as *indirect effect*, as the impact of credence attributes on consumers' willingness to pay for a product is mediated by

consumers' perceived quality. Similarly, in this study, we propose that the effect of credence attributes on consumers' attitudes can be defined as "indirect" when it is mediated by consumers' beliefs in the presence of individual product attributes. Some researchers have found that the impact of place of origin of a product on consumers' attitudes is given only by the indirect effect as a mediation of consumers' beliefs in the presence of experience attributes (e.g., Ericksson et al., 1984).

Other researchers found that the idea of a place of origin on its own, when attached to a product, can generate consumers' positive affective feelings for the product (Johansson and Nebenzahl, 1986; Van Ittersum et al., 1991; Verlegh and Steenkamp, 1999). These affective feelings are sometimes based on retrieval of personal past experience with the place of origin (e.g., Obermiller and Spangenberg, 1989; Li and Wyer ,1994), while sometimes the place of origin can contribute to the creation of a consumer's self-image (Keller, 1998). In these circumstances, Van der Lans et al. (2001) claim that the place of origin has a *direct effect* on consumers' attitude towards a product, which means that the place of origin has an impact on consumers' attitudes towards a product without any mediation. Similarly, in this study, we propose that the effect of credence attributes on consumers' attitudes can be defined as "direct" when there is no mediation in this relationship. Van der Lans et al. (2001) found that direct and indirect effect of region-of-origin attributes can coexist. However, other studies have found that place of origin has sometimes no direct effect at all (Ericksson et al., 1984).

The Moderation Effect of Consumers' Familiarity with the Product

Consumers' familiarity with a product is "the number of product-related experiences that have been accumulated by the consumer" and is a major component of product

knowledge (Alba and Hutchinson, 1987). Familiarity with a product influences how a person searches, uses and recalls information about that product (e.g., Park and Lessig, 1981; Punj and Staelin, 1983; Johnson and Russo, 1984).

Researchers found that consumers with different levels of product familiarity use different cues to form their beliefs about the quality of a product (Rao and Monroe, 1988). Specifically, consumers with a lower familiarity with the product use cues that are extrinsic to the product (Olson, 1977). For example, a consumer that has low familiarity with wine is more inclined to evaluate quality from cues such as price, country-of-origin or the name of the wine. In other words, consumers that are not familiar with a product tend to use country-of-origin as a stereotype to evaluate a product, as they do not know how to obtain more accurate information (Bodenhausen and Lichtenstein, 1987). On the other hand, consumers with a higher familiarity with the product make a larger use of cues that are intrinsic to the product, such as a wine's color or flavor (Rao and Monroe, 1988). The theory on the consumers' familiarity with a product (Rao and Monroe, 1988) leads us to hypothesize that the indirect effect of credence attributes, which are extrinsic cues, may vary according to the level of consumers' familiarity with a product.

Conceptual Framework and Hypotheses

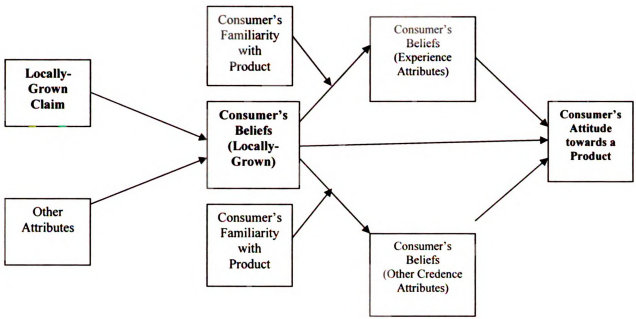
To explore why credence attributes have an impact on consumers' attitudes, our conceptual framework builds upon the theory of attitude formation (Fishbein and Ajzen, 1975), the theory of direct and indirect effect of place-of-origin attributes (Van der Lans et al., 2001) and the theory of consumers' familiarity with a product (Rao and Monroe,

1988) (Figure 1). In this study, we test our conceptual framework in the specific context of "locally-grown" attributes.

Given the nature of credence attributes of being verifiable by consumer neither before nor after disposal, we firstly distinguish between the seller's credence claim and the buyers' beliefs that the credence attribute is actually in place. In the case of "locally-grown" attributes, as there is no current unambiguous definition of what is "local" or not (Darby et al, 2008), consumers may perceive some products to be "more locally-grown" or "less locally-grown". The concept of consumers' beliefs in the presence of the "locally-grown" attribute as a scale of values is consistent with the learning theory of attitude formation (Fishbein, 1967). Therefore, we propose that sellers' "locally-grown" claims and buyers' beliefs are separate variables, and that sellers' claims have an impact on buyers' beliefs. Along with sellers' "locally-grown" claims, other attributes, such as the color or the flavor of a product may have an impact on consumers' beliefs in the presence of the "locally-grown" attribute. In this study, we do not test this proposition but do recognize this as an area for valuable future research.

Second, given the existing evidence from the place-of-origin literature (Van der Lans et al., 2001), we hypothesize that "locally-grown" has both a direct effect and an indirect effect on consumers' attitude towards a product. Previous studies on consumers' preferences for local products provide elements suggesting that "locally-grown" may have this dual effect (Darby et al., 2008). Specifically, in Darby et al. (2008), respondents revealed that they value "locally-grown" strawberries mainly because they are fresher, but also because they simply like the idea of eating strawberries from their own land of origin. This suggests that the credence attribute "locally-grown" is a cue of an experience

Figure 1 - The Direct Effect and the Indirect Effect of Credence Attributes on Consumer Attitudes



Legend: Consumer's Beliefs (Attribute) means "Consumers' Beliefs in the Presence of an Attribute".

attribute, such as the freshness, as well as a direct driver of a consumer's attitude towards strawberries. Similarly, we hypothesize that the indirect effect of "locally-grown" is mediated by a consumer's beliefs in the presence of other credence attributes, such as environmental-friendliness. In other words, we hypothesize that:

H1. Consumers' beliefs that a product is "locally-grown" are positively associated with their attitude towards the product.

H2. Consumers' beliefs in the presence of experience attributes are partial mediators of the effect of consumers' beliefs that a product is "locally-grown" attribute on their attitude towards the product.

H3. Consumers' beliefs in the presence of other credence attributes are partial mediators of the effect of consumers' beliefs that a product is "locally-grown" attribute on their attitude towards the product.

Finally, on the basis of evidence from the theory of consumers' familiarity with a product (Rao and Monroe, 1988), we hypothesize that consumers' familiarity with the product mitigates the indirect effect of "locally-grown" attributes on consumers' attitudes towards a product. As shown by Rao and Monroe (1989), a "locally-grown" attribute, such as other cues that are extrinsic to the product, is more used by low-familiarity consumers as a stereotype to infer product quality. Similarly, we hypothesize that a "locally-grown" attribute is more used by low-familiarity consumers as a stereotype to evaluate the presence of other attributes of a product, such as its flavor or its safety. In other words, we hypothesize that:

H4. Consumer's familiarity with a product mitigates the indirect effect of "locally-grown" attributes on consumers' attitude towards the product mediated by consumers' beliefs in the presence of other credence attributes and experience attributes.

Methodology

To test our hypotheses, data were collected through an on-line experiment administered to a convenience sample of 60 undergraduate and graduate students enrolled at Michigan State University, East Lansing, Michigan. The experiment was conducted during October and November 2008. Students were recruited in two convenient campus locations. We did not exclude any sub-group from the sample population of students. Out of the students that undertook the questionnaire, 76% were graduate students and 24% were undergraduates. Males were 59% of the sample, while US citizens were only 37% of the sample.

We chose "locally-grown" apples as the product of interest of our study for several reasons. First, apples represented a convenient product, as it is cheap and easy to handle in an experimental setting. Second, there is a wide literature of experiments based on apples that we could use as reference for our research design (e.g., Manalo, 1990; DeEll and Prange, 1992; Mehinnagic et al., 2003). Third, as the location of this study is a large producing and consuming state of apples, we assumed that our sample population, on average, was familiar with the expression "locally-grown" apples, although not univocally defined. Although 63% of the sample was from outside the US, 70% of them were in the US for more than one year. Hence, we assume they were likely to have

acquired some familiarity with "locally-grown" products. For the same reason, we assumed that respondents generally had enough involvement with the product to undertake a fairly complex questionnaire.

Experimental Procedure

Out of these 60 respondents, 20 students undertook a pre-test questionnaire and 40 students completed the final questionnaire.

We performed a pre-test questionnaire to assess which attributes the respondents most likely infer from "locally-grown" claims. Respondents were first asked to pick up to three experience attributes that they infer when evaluating a "locally-grown" apple from a list of eight suggested attributes. Second, they were asked to pick up to three credence attributes that they infer when evaluating a "locally-grown" product from a list of twelve suggested attributes. The lists of suggested experience and credence attributes were created from previous research on consumers' perceptions of attributes related to apples (e.g., Manalo, 1990; DeEll and Prange, 1992; Mehinnagic et al., 2003). We found that, when they observe a "locally-grown" apple, respondents most commonly infer credence attributes such as pest and disease-free, pesticide and chemical-free, and healthy. Also, they most commonly infer experience attributes such as firm, sweet and having good flavor. Therefore, in our final experiment we used these three credence attributes and three experience attributes as possible mediators of the relationship between "locally-grown" attributes and consumers' attitudes towards apples.

The final experiment involved two treatments with two levels each, giving four stimuli in total. The first treatment is the credence claim that an apple is "locally-grown", where the two levels are presence or absence of the "locally-grown" claim. This

treatment has the purpose of creating variation in the respondents' beliefs that the apple is locally-grown. The second treatment is the picture of an apple, where the two levels are presence or absence of a picture of an apple. The purpose of this treatment is to introduce a control variable in the model that may reduce the effect of the "locally-grown" attribute on consumers' beliefs and attitudes towards a product.

Students that accepted to participate in the final experiment were contacted by e-mail and directed to an on-line experiment, which took on average 15 minutes. First of all, respondents were asked demographic questions (e.g., gender, nationality, student year) and eight questions measuring their familiarity with apples, such as "how frequently do you consume apples, including both home and away from home?" and "Do you presently have some apples with you at home?". From these eight questions, we computed a familiarity score for each respondent. Therefore, respondents were divided in two groups and each respondent was administered two stimuli, which corresponds to one level for each of the two treatments. As each of the 40 subjects was administered two stimuli, we had a total of 80 observations from the final questionnaire. When the "locally-grown" claim was present, respondents were asked to "think about an apple that is claimed to be locally-grown". When this treatment was absent, respondents were simply asked to "think about any apple that they would find in their shopping location". When the apple picture was present, respondents were asked to "look at the apple in the picture". When this treatment was absent, there was simply no mention of apple pictures in the questionnaire.

After each stimulus, we measured beliefs in the presence of the "locally-grown" attribute. We also measured beliefs in the presence of the other credence and experience

attributes that were previously selected in the pre-test. Beliefs were measured with a seven-point Likert-scale question, where respondents were asked: "To what extent do you believe that this apple is locally-grown?". Finally, we measured respondents' attitudes towards apples, without any difference across groups. As commonly in use in the literature, to assess consumers' attitudes (Eagly and Chaiken, 1993), we asked: "How would you describe your attitude towards this apple?" and then asked to answer on four seven-point Likert-scales, namely from bad (1) to good (7), from dislike to like, from negative to positive and from unfavorable to favorable. At the end of the experiment, each respondent received ten dollars compensation.

The Model

Data were analyzed with a structural equation model, based on a system of regressions combining a factor model and a path model. In the factor model, the latent construct "consumers' attitude towards an apple" (*F1*) is hypothesized to be a predictor of the four measurable indicators of attitude: bad/good attitude (*V1*), dislike/like attitude (*V2*), negative/positive attitude (*V3*) and unfavorable/favorable attitude (*V4*). Therefore, we write:

$$V1 = F1 + e_1; \quad (2)$$

$$V2 = F1 + e_2; \quad (3)$$

$$V3 = F1 + e_3; \quad (4)$$

$$V4 = F1 + e_4. \quad (5)$$

In these regressions, e_1 to e_4 are the errors associated to each measured variable V1 to V4.

In the structural model, consumers' beliefs in the presence of the "locally-grown" attribute [B(LG)], of other credence attributes [B(CredAttr)] and of experience attributes [B(ExpAttr)] are hypothesized to predict the construct "consumers' attitude towards an apple" (F1). Moreover, consumers' beliefs in the presence of the "locally-grown" attribute are predicted by the seller's credence claim (LG), the picture of the apple (PIC) and by the consumers' familiarity with apples (FAM), as well as by their respective interactions (LGPIC; FAMLG; FAMPIC; FAMLGPIC). Finally, consumers' beliefs in the presence of experience and other credence attributes are predicted by their beliefs in the presence of the "locally-grown" attribute, by their familiarity with the product and by picture of the apple, as well as by their interactions. Then, we write:

$$F1 = a_5 B(LG) + \mathbf{b_5 B(ExpAttr)} + \mathbf{c_5 B(OCredAttr)} + d_5 PIC + e_5; \quad (6)$$

$$B(LG) = a_6 LG + b_6 PIC + c_6 LGPIC + d_6 FAM + f_6 FAMLG + g_6 FAMPIC + h_6 FAMPICLG + e_6; \quad (7)$$

$$\mathbf{B(ExpAttr)' = a_7 BLG + b_7 FAM + c_7 PIC + d_7 FAMPIC + f_7 FAMBLG + e_7}; \quad (8)$$

$$\mathbf{B(OCredAttr)' = a_8 BLG + b_8 FAM + c_8 PIC + d_8 FAMPIC + f_8 FAMBLG + e_8}. \quad (9)$$

In these regressions, **B(ExpAttr)** and **B(OCredAttr)** represent 1x3 vectors, as three experience attributes and three other credence attributes are considered in this study. Therefore, $\mathbf{b_5}$ and $\mathbf{c_5}$ are also 1x3 vectors, while the predictors of **B(ExpAttr)'** and **B(OCredAttr)'** are 3x1 vectors. Finally, e_5 and e_6 represent the errors associated to dependent variables *F1* and *B(LG)*, while $\mathbf{e_7}$ and $\mathbf{e_8}$ represent the 3x1 vectors of errors associated with the dependent variables **B(ExpAttr)'** and **B(OCredAttr)'**.

Results

Results from the confirmatory factor analysis are presented in Table 1. The latent construct "consumers' attitude towards the apple" loads to each of the four indicators of attitudes that we have proposed, V1 to V4, with a statistical significance at 5%. Therefore, the four indicators of consumers' attitudes towards a product are significant reflective measures of the factor "attitudes towards the apple". Moreover, as chi-square = 1.77 with d.f. = 1 such that its p-value = 0.18, there is a good fit of the factor model with the data. Therefore, we conclude that this factor model has convergent validity and we use this "attitude towards apples" construct as dependent variable in the structural equation model.

Table 1 - Results of the Confirmatory Analysis

Dependent Variable	Independent Variables	Errors	R-Squared
V1	.950* F1	.312*	.903
V2	.950* F1	.314*	.902
V3	.941* F1	.340*	.885
V4	.927* F1	.375*	.859
Chi-Square = 1.767 based on 1 d.f.; P-Value = 0.18374. RMSEA = 0.102. 90%, Confidence Interval = (0.000, 0.343)			

Legend: V1 : Bad/Good Attitude Indicator; V2 : Dislike/Like Attitude Indicator; V3 : Unfavorable/Favorable Attitude Indicator; V4 : Unfavorable/Favorable Attitude Indicator; F1 : "Consumer's Attitude towards the Apple" Latent Construct.
Note: *Statistics significant at 5% level.

Results from the structural equation model are presented in Table 2. After performing the Wald (W) test and the Lagrange Multiplier (LM) tests for respectively dropping and including new free parameters, we decided to fix three parameters to zero. Specifically, we dropped the variables "consumers' familiarity with the product" (FAM) and "apple picture" (PIC) from the regression on consumers' beliefs in the presence of

the attribute "locally-grown" (BLG), as the W-test indicated that these two variables had no impact on the dependent variable. For the same reason, we dropped the variable "apple picture" also from the regression on consumers' attitude towards the apple (*F1*). This result from the W-test suggests that introducing the variable "picture of an apple" as a control in the model does not reduce the impact of a "locally-grown" attribute on consumers' attitudes towards a product.

The overall fit of the structural equation model with the data is low, as chi-square = 1467 with d.f. = 124, such that its p-value < 0.01, while the root mean-square error of approximation (RMSEA) is equal to 0.38. This problem might be caused by the small sample size, which does not guarantee a sufficient power for testing the hypothesis of exact fit of the model with the population. Looking at the specific regressions of the model, sellers' credence claim (LG), the apple picture (PIC) and respondents' familiarity with apples (FAM) do not explain much of the variation of consumers' beliefs in the presence of the attribute "locally-grown", as R^2(BLG) = 0.11 only. On the other hand, goodness-to-fit measures of the other regressions of the model indicate that the hypothesized predictors explain a large part of the variance of the respondents' beliefs in the presence of the experience and other attributes, as well as of their attitudes towards the apples.

After evaluating the overall fit of the model, we assess the significance of the individual parameters. From the regression on respondents' beliefs that an apple is "locally-grown", we found no variable having a significant impact at the 5% statistical significance. From both the regressions on respondents' beliefs in the presence of the

Table 2- Results of the Structural Eqaution Model

Dependent Variable	Independent Variables	Errors	R-Squared
V1	.981* F1	.192*	.963
V2	.980* F1	.198*	.961
V3	.976* F1	.219*	.952
V4	.970* F1	.242*	.941
BLG	.189 LGCLAIM .206 LGPIC .092 FAMLG -.027 FAMPIC -.155 FAMPICLG	.942*	.112
BHEALTH	.404* BLG .237* FAM -.286* PIC .301* FAMPIC -.313* FAMBLG	.719*	.484
BPEST	.339* BLG .269* FAM -.376* PIC .114* FAMPIC .484* FAMBLG	.536*	.713
BCHEM	.535* BLG .220* FAM -.222* PIC .114* FAMPIC -.425* FAMBLG	.652*	.575
BGFLAV	.484* BLG .316* FAM -.271* PIC .254* FAMPIC -.484* FAMBLG	.548*	.700
BSWEET	.467* BLG .329* FAM -.370* PIC .244* FAMPI -.476* FAMBLG	.506*	.744
BFIRM	.441* BLG .231* FAM -.435* PIC .349* FAMPIC -.395* FAMBLG	.542*	.707
F1	.146* BLG .106 BHEAL .265* BPEST -.073 BCHEM .219* BGFLAV .164SWEET .230*BFIRM	.486*	.764
Chi-Square = 1467.214, 124 d.f., P-Value = 0.00000. RMSEA= 0.383. 90% CONFIDENCE INTERVAL OF RMSEA (.363; .398).			

Legend: V1 : Bad/Good Attitude Indicator; V2 : Dislike/Like Attitude Indicator; V3 : Unfavorable/Favorable Attitude Indicator; V4 : Unfavorable/Favorable Attitude Indicator; F1 : Consumer's Attitude towards the Apple (Latent Construct); BLG : Consumer's Belief that the Apple is Locelly-Grown; LGCLAIM : Claim that the Apple is Locally-Grown (Treatment); PIC : Visual Observation of the Apple; LGPIC : Interaction LG and PIC; FAM : Consumer's Familiarity with Apples; FAMPIC : Intaraction FAM and PIC; FAMBLG : Interaction FAM and BLG; BHEAL : Consumer's Belief that the Apple is Healthy; BPEST : Consumer's Belief that the Apple is Free of Pests and Diseases; BCHEM : Consumer's Belief that the Apple is Free of Chemicals; BGFLAV : Consumer's Belief that the Apple has a Good Flavor; BSWEET : Consumer's Belief that the Apple is Sweet; BFIRM : Consumer's Belief that the Apple is Firm; E1-E11 and D1: Errors. *Statistics significant at 5% level.

experience attributes and of other credence attributes, we found that respondents' beliefs that an apple is "locally-grown" (BLG) and respondents' familiarity with apples (FAM) have a positive impact which is statistically significant at a 5% level. However, we found that, in the same regressions, the interaction between these two variables (BLG and FAM), which is called FAMBLG, has a negative impact on respondents' beliefs in the presence of the experience attributes and of other credence attributes. This overall means that respondents use the "locally-grown" attribute of an apple to infer sweetness, firmness, flavor and healthiness of an apple, as well as the absence of pests/diseases and absence of chemicals/pesticides in it. However, respondents' familiarity with apples mitigates the use of "locally-grown" as a cue of these attributes, as hypothesized (H4). Finally, we found that the visual observation of the apple (PIC), while having a negative effect on respondents' beliefs, does not reduce the impact of "locally-grown".

From the regression on respondents' attitude towards the apple, we found that consumers' beliefs in the presence of the attributes "locally-grown" (BLG), absence of pests and diseases (BPEST), good flavor (BGFLAV) and firmness (BFIRM) have a positive impact which is statistically significant at a 5% level. Therefore, respondents' beliefs in the presence of both the "locally-grown" attribute, experience and other credence attributes (i.e. apples are free of pests and diseases (BPEST), have good flavor (BGFLAV) and are firm (BFIRM)) have a positive impact on attitudes towards the apple. On the other hand, we found the impact of consumers' beliefs in the presence of the attributes healthiness (BHEAL), absence of chemical residues (BCHEM), and sweetness (BSWEET) on respondents' attitude towards apples is not significant at a 5% level.

From these results, we therefore find evidence that respondents' beliefs in the presence of the "locally-grown" attribute have a direct effect on respondents' attitude towards the apples, and so we find support to our hypothesis H1. On the other hand, we find that respondents' beliefs in the presence of the "locally-grown" attribute have an impact on their beliefs in the presence of other credence (BPEST) and experience attributes (BGFLAV and BFIRM) that in turn have an impact on respondents' attitudes towards the apples. In other words, respondents' beliefs in the presence of the experience attributes and of other credence attributes are both partial mediators of the impact of respondents' beliefs in the presence of the "locally-grown" attribute on their attitude towards the apple, as hypothesized (H2 and H3).

Conclusions

By analyzing the direct and indirect effect of credence attributes on consumers' attitudes towards a product, this study aims at bringing a conceptual and methodological contribution to the existing agricultural economics literature. From a conceptual standpoint, we introduced three novel constructs. First, by using the learning theory of attitude formation (Fishbein, 1967), we introduced the distinction between a seller's credence claim and a consumer's beliefs in the presence of credence attributes. Second, by expanding the theory of the use of country-of-origin attributes as cues of perceived quality (Pharr et al., 2005), we analyzed on the consumer's use of credence attributes as cues of other product attributes. Third, by building upon the theory of Rao and Monroe (1988), we defined the role of a consumer's familiarity with the product as a moderator of the use of credence attributes as cues of other product attributes.

From a methodological standpoint, we suggested a quantitative method to separate the direct and the indirect effect of credence attributes on consumers' attitudes towards a product. By doing this, we introduced a more specific definition of indirect effect of credence attributes compared to the one proposed by Van der Lans et al. (2001). We proposed that the effect of credence attributes on consumers' attitudes towards a product is indirect when mediated by consumers' beliefs in the presence of other product attributes, either credence or experience.

Empirical evidence from this study should be considered preliminary because of the limited sample size. Since a relatively complex model was estimated with 80 observations, we obtained a low power for testing the overall fit of the structural model to the data. In future research, a larger sample should be used to test the overall fit of the model proposed.

Although the power of the test is low, results provide empirical support to the four hypotheses of this study. First of all, consumers' beliefs in the presence of the credence attribute "locally-grown" have both a direct and indirect effect on their attitudes towards apples. As regards to the indirect effect, consumers' beliefs in the presence of both experience attributes and other credence attributes act as mediators of this relationship. This confirms but also provides complementary detail to the evidence found by Van der Lans et al. (2001). Furthermore, consumers' familiarity with apples acts as a negative moderator of the impact of their beliefs in the presence of credence attributes as cues of other attributes. This seems consistent with the conclusions by Rao and Monroe (1988), who found that highly familiar consumers use extrinsic cues less than low familiar consumers.

Results from this study have both managerial and policy implications. On one hand, understanding *why* consumer value credence attributes is crucial for a firm's marketing communication strategies. By knowing whether consumers value a credence attribute on its own or rather use it as a cue of other valued attributes, a marketer can make his communication more effective. On the other hand, public agencies and non-profit organizations having the purpose of changing people's buying, consumption and disposal habits can learn from the distinction between direct and indirect effect of credence attributes, as well as from the moderation role of people's familiarity with a product.

Future research in this area should address the following limitations of this study. First of all, this study has not analyzed the drivers of consumers' beliefs in the presence of a credence attribute, while focusing only on their effects. Future research should address the impact of other product attributes as a major driver of consumers' beliefs in the presence of credence attributes. Second, this study is limited to the effects of the credence attribute "locally-grown", while other credence attributes may behave differently from "locally-grown" attributes. By expanding the experiment to a broader set of credence attributes, it would be possible to find and explain differences direct and indirect effect of credence attributes on consumers' attitudes towards a product. Third, consumers' personal values, which are largely studied in consumer psychology (e.g., Sheth et al., 1991; Schwartz, 1992), may explain a large part of the variation of the magnitude of the direct and indirect effect of credence attributes on consumers' attitudes towards a product. Future research may analyze the role of consumers' personal values as a key moderator of this relationship.

Appendix A

SURVEY INSTRUMENT – CHAPTER 1

Demographics

1. Are you male or female?

- ◉ Male
- ○ Female

2. What is the category of student that best represents you right now?

- ○ Freshman
- ○ Sophomore
- ○ Junior
- ○ Senior
- ○ Graduate

3. What is your country of citizenship?

- ☐ United States
- ☐ Other country (please specify country name)_____
- ☐ Other country (please specify country name, in case of double citizenship)_____

4. If you are citizen of a country different from United States, how long have you been living within this country?

- ○ Less than 3 months
- ○ Between 3 and 6 months
- ○ Between 6 and 12 months
- ○ Between 1 year and 2 years
- ○ Between 2 and 5 years
- ○ Between 5 and 10 years
- ○ More than 10 years

Consumer Familiarity with Products

5. How frequently do you consume apples, including both home and away from home?

Never	Less than Once a Month	Once a Month	2-3 Times a Month	Once a Week	2-3 Times a Week	Daily
○	○	○	○	○	○	○

6. How knowledgeable are you about the quality of apples when you make your buying choice?

Very Unknowledgeable						Very Knowledgeable
1	2	3	4	5	6	7
○	○	○	○	○	○	○

7. Do you presently have some apples with you at home?

- ◉ Yes
- ○ No

8. Please list up to five varieties of apples that you know

Variety 1
Variety 2
Variety 3
Variety 4
Variety 5

9. Please list up to three attributes that you consider DURING your consumption of apples to evaluate its quality (for example, its juiciness).

1
2
3

10. Please list up to three visual attributes of the apple that you consider BEFORE consuming an apple to evaluate its quality (for example, the presence of buises and blemishes on its skin).

1
2
3

11. Please list up to three pieces information that you consider when you evaluate the quality of apples (for example, whether it is organic or not)

1
2
3

12. Do apples from Washington have higher quality than apples from New York, or vice versa?

○ Apples from New York have higher quality

- ○ Apples from Washington have higher quality
- ○ It depends

13. In the Lansing area, name up to five stores that you can think of that carry "specialty apples".

1 _____
2 _____
3 _____
4 _____
5 _____

14. In which specific country of the world are these varieties of apples traditionally produced? (please do not guess nor look at the answer on-line)

Jonathan _____
Fuji _____

Consumer Values

Please rate to what extent you agree or disagree with the following statements.

15. Usually, an important thing that I consider when I choose my food is its nutritional value, its healthiness and its safety.

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

16. Usually, an important thing that I consider when I choose my food is its taste and its aspect.

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7

17. Usually, an important thing that I consider when I choose my food is if its production process respects the environment, guarantees good standards of living to small farmers, and/or contributes to the development of disadvantaged communities.

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

18. Where would you place yourself on a scale from 1 to 7, if eating food that respects farmers and/or the environment is a 1 and enjoying the food experience is a 7?

Eating Food Respecting Environment and/or People 1	2	3	4	5	6	Enjoying the Food Experience 7
○	○	○	○	○	○	○

19. Where would you place yourself on a scale from 1 to 7, if eating healthy food is a 1 and eating food that respects farmers and/or the environment is a 7?

Eating Healthy Food 1	2	3	4	5	6	Eating Food Respecting the Environment 7
○	○	○	○	○	○	○

20. Where would you place yourself on a scale from 1 to 7, if enjoying the food experience is a 1 and eating healthy food is a 7?

Enjoying Food Experience 1	2	3	4	5	6	Eating Healthy Food 7
○	○	○	○	○	○	○

21. Please rate to what extent you agree or disagree with the following statements.

"If you eat well, you live well".

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

22. "If you are able to enjoy your food, you are able to enjoy your life".

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

23. "As a consumer, you have the power of awarding the companies that respects small farmers and the environment, as well as punishing those that do not respect them".

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	◉	○	○	○	○

Treatment 1

Now imagine that you see an apple claimed to be "locally-grown" in your shopping location.

24. Which claim did you just receive about this apple?

- ○ It is from Washington
- ○ It is "locally-grown"
- ○ It is organic

25. How would you describe your attitude towards an apple claimed to be "locally-grown"?

Unfavorable						Favorable
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Dislike						Like
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Negative						Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Bad						Good
1	2	3	4	5	6	7
○	○	○	○	○	○	○

26. To what extent do you believe that an apple claimed to be "locally-grown" is really grown locally?

Very Weak Belief						Very Strong Belief
1	2	3	4	5	6	7
○	○	○	○	○	○	○

To what extent do you expect that an apple claimed to be "locally-grown"...

27. ...has a good flavor?

Very Low Expectation						Very High Expectation
1	2	3	4	5	6	7
○	○	○	○	○	○	○

28. ...is sweet?

Very Low Expectation 1	2	3	4	5	6	Very High Expectation 7
○	○	○	○	○	○	○

29. ...is firm?

Very Low Expectation 1	2	3	4	5	6	Very High Expectation 7
○	○	○	○	○	○	○

To what extent do you believe that an apple claimed to be "locally-grown" is...

30. ...healthy?

Very Weak Belief 1	2	3	4	5	6	Very Strong Belief 7
○	○	○	○	○	○	○

31. ...free from chemical residues?

Very Weak Belief 1	2	3	4	5	6	Very Strong Belief 7
○	○	○	○	○	○	○

32. ...free from pests and diseases?

Very Weak Belief 1	2	3	4	5	6	Very Strong Belief 7
○	○	○	○	○	○	○

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Chapter 2

BUILDING INDIVIDUAL BRANDS WITH PLACE-OF-ORIGIN INFORMATION: IMPLICATIONS FOR THE INDUSTRY

Growing segments of world consumers seek better quality, healthiness and larger variety in their food consumption (Verbeke, 2005; IDDBA, 2008). As part of this process, consumers' attention for place-of-origin (POO) attributes as part of the demand of agri-food products is increasing (Grunert, 2005). The major dimension of POO attributes that have been studied in agricultural economics and marketing literature since the 1960s is country-of-origin (Dichter, 1962; Schooler, 1965; Peterson and Jolibert, 1995; Verlegh and Steenkamp, 1999; Loureiro and Umberger, 2005; Ehmke et al., 2008) while in the last decade region-of-origin attributes have been studied separately, in relation with consumers' values for tradition and authenticity of agri-food products (Kuznesof et al., 1997; Tregear et al., 1998; Van der Lans et al., 2001; Scarpa et al., 2005).

These strands of the literature have primarily analyzed the impact of POO attribute information on consumers' product evaluation (Peterson and Jolibert, 1995; Verlegh and Steenkamp, 1999; Loureiro and Umberger, 2005) and the factors explaining how this impact varies, including consumers' characteristics (Knight and Calantone, 2000; Scarpa et al., 2005; Ehmke et al., 2008; Gao and Schroder, 2009), consumers'

motivations (Verlegh and Steenkamp, 1999; Van der Lans et al., 2001; Loureiro and Umberger, 2005; Lusk et al., 2006) and product characteristics (Ward et al., 2003). While these studies found that POO attributes have a significant impact, either positive or negative, on consumers' evaluation of a generic product, only a few studies analyzed how POO attribute information can differentiate an individual brand from the other brands within a product category. The problem of brand differentiation within a product category with a POO attribute - for example, differentiation of the brand Sun Maid California raisins from other California raisins (Crespi and Marette, 2002) - has been already tackled in the literature (Brester and Schroeder, 1995; Kaiser and Liu, 1998; Chung and Kaiser, 2000; Crespi and Marette, 2002). However, these studies are based upon estimations of the aggregate demand elasticity for various types of POO information, but they have not analyzed individual consumers' perceptions and buying intentions.

This study has the purpose of starting to fill this gap by analyzing which POO information, if any, has an exclusive impact on an individual brand and differentiate it from other brands within a product category with a POO attribute. Analyzing which POO information differentiates a brand from other brands with the same POO attribute has important implications for firms within an industry. As suggested by Crespi and Marette (2002), through POO information a firm owning a brand can create a competitive advantage over other firms selling products with the same POO attribute. This can be crucial as firms may not always cooperate with its neighbors to jointly increase consumers' evaluation for its POO, but they may also be forced to compete with them to get access to a limited number of buyers (Steenkamp and Van Trijp, 1996).

To analyze the impact of POO information on consumers' evaluation for an individual brand, we found appropriate to develop a theoretical framework that builds upon the theory of attitude formation, developed in psychology and largely applied to marketing (Fishbein, 1967; Fishbein and Ajzen, 1975; Lutz, 1991). According to the theory of attitude formation, consumers form their attitude towards a brand and ultimately their intentions to buy it not only by evaluating how much they like each brand attribute, but also by assessing how strongly they believe that the brand is associated to each attribute (Fishbein, 1967; Lutz, 1991). Therefore, to improve the understanding of consumers' choice of individual brands with POO attributes, we analyze which POO information has an impact on consumers' belief strength of the association between the individual brand and the POO attribute, on their attitudes towards a brand and ultimately on their WTP a premium price for a brand relatively to its competitors in the market.

We test our proposed theoretical framework with data collected from 241 graduate students at Michigan State University through an internet-based experiment. In particular, we assess differences in respondents' beliefs, attitudes and WTP a premium price for a brand across groups receiving different sets of POO information treatments with a series of path models.

This article is organized as follows. In section 2, we review the relevant literature on POO attributes and formation of attitudes. Building upon this literature, we present our theoretical framework and hypotheses in section 3. In section 4, we describe the method we use to test these hypotheses. Results are presented in section 5, while our conclusions are drawn in section 6.

Literature Review

The concept of "place-of-origin" attributes has often been used in the literature (Moore, 1980; Hong and Wyer, 1990; Bertozzi, 1995; Van der Lans et al., 2001; Skuras and Vakrou, 2002) to generalize the analysis across country-of-origin attributes and region-of-origin attributes. Country-of-origin attribute are typically communicated through the phrase "made in" a specific country and they are an extrinsic product cue similarly to price, brand name or warranty, as none of these directly bear on product performance (Peterson and Jolibert, 1995). Region-of-origin attributes are similar extrinsic product cues that, differently from country-of-origin attributes, are usually strongly associated to culture, history and people of a geographical area (Kuznesof et al., 1997; Van der Lans et al., 2001). Wines, cheeses, onions, grapefruits, wooden furniture, perfumes, and cigars are all examples of products being marketed as national products (Centner et al., 1989; Kotler et al., 1993; Papadopoulos, 1993), but the same influence is expected in other places of origin such as regions and provinces (Hauser, 1993; Balling, 1995) but also trade zones and continents (Papadopoulos, 1993; Smith, 1993).

From the 1960s, many studies in marketing and agricultural economics literature have agreed that POO attributes may have a positive impact on consumers' evaluation of products (Dichter, 1962; Schooler, 1965; Peterson and Jolibert, 1995; Verlegh and Steenkamp, 1999; Balabanis and Diamantopoulos, 2004; Loureiro and Umberger, 2005; Ehmke et al., 2008), but also a negative impact when country image is not favorable to consumers or when the image of the place does not fit with the product (Van Ittersum etb al., 2000). However, the impact of POO may vary according to various consumer

characteristics (Bonnet and Simioni, 2001; Scarpa et al., 2005) and product characteristics (Agrawal and Kamakura, 1999; Ward et al., 2003).

These studies have analyzed the impact of adding a POO attribute on consumers' attitudes and buying intentions for a generic product, but not for an individual brand (Verlegh and Steenkamp, 1999; Piron, 2000; Pecotich and Rosenthal, 2001). However, in the marketplace brands can be more or less associated to the place of origin by consumers, according to the other brand attributes and to brand information, which act as signals of the POO attribute (Keller, 1993). Therefore, the impact of adding POO attributes on consumers' attitudes and buying intentions may vary significantly according to factors related to the individual brands. In this study, we attempt to integrate the extant literature by exploring which information influences the impact of POO attributes on consumers' beliefs, attitudes and intentions to buy a brand and so differentiates an individual brand from its competitors with the same POO attributes.

Attribute and Brand Place-of-Origin Information

To explore which information has an impact on consumers' belief strength of the association between a brand and the POO, we first distinguish between the concepts of *attribute POO information* and *brand POO information.* This distinction is similar to the distinction between generic advertising and branded advertising introduced by Crespi and Marette (2002).

Attribute and brand POO information have the same ultimate goal, that is increasing consumers' evaluation and WTP for brands with the POO attribute, but differ as they provide fundamentally different messages to consumers. In particular, *attribute POO information* aims at increasing consumers' evaluations for brands with the POO

attribute by emphasizing the benefits given by the POO attribute and creating associations between the POO attribute and other favorable attributes. For example, attribute information about California raisins aims at increasing consumers' evaluation for the attribute "California" when associated to the product "raisins". Also, this information aims at increasing consumers' beliefs that the attribute "California" is associated with other quality attributes such as "good flavor" and "eco-friendly". On the other hand, *brand POO information* aims at increasing consumers' evaluations for brands with the POO attribute by strengthening consumers' beliefs that a particular brand is associated with the POO attribute and with other favorable attributes. For example, brand information about "Sun Maid Raisins" aims at increasing consumers' association between Sun Maid and California, as well as other favorable associations such as between Sun Maid and "good flavor" or between Sun Maid and "sunny land".

Generic advertising, "place branding" and in large part also POO certifications and labels release attribute information, as they aim at increasing consumers' evaluation for POO attribute and at strengthening the association between the POO and other favorable attributes. When promoting a product with a POO attribute, such as California Raisins, generic advertising aiming at shifting consumer demand for the entire product category with that attribute (Brester and Schroeder, 1995; Piggott et al., 1996; Kinnucan et al., 1997; Kaiser and Liu, 1998; Chung and Kaiser, 2000; Crespi and Marette, 2002) and at creating a favorable product-country image (Laroche et al., 2005, Lusk et al., 2006), whereas an image can be defined as a set of strong and consistent associations that reinforce each other (Keller, 1993). Generic advertising can be implemented both by a

private firm, a private group of firms or by a public entity representing the firms within a territory.

Similarly, "place branding" (Kotler et al., 1993; Kavaratzis, 2005; Iversen and Hem, 2008) are promotion activities aiming at building an image and reputation across all the products and services offered within the POO, assuming that there might be spillover effects across different products and services from the same POO. Place branding activities are usually implemented by multiple private actors within a POO as well as funded or sometimes even managed by public entity.

Promotion and advertising activities implemented by firms, inter-firm organizations or public entities can be classified as means to release either attribute information or brand POO information, or potentially to release both.

Information on POO certifications and labels, such as Protected Denominations of Origin in Europe (Van Ittersum et al., 2000; Bonnet and Simioni, 2001; Verbeke and Ward, 2006) or voluntary Country-of-Origin Labeling (COOL) (Loureiro and Umberger, 2005; Lusk et al., 2006; Verbeke and Ward, 2006), usually has a more ambiguous role in changing consumers' perceptions. On one hand, POO certifications and labels are seals guaranteeing consumers that a specific branded product is indeed from the POO and is produced according to certain quality standards, and therefore would classify as brand information. On the other hand, most of the information on POO certifications and labels usually aims at convincing consumers that the entire product category with the POO attribute is controlled and selected according to high quality standards, and therefore classifies as an attribute information, as it aims at increasing consumers' evaluation for the POO attribute.

In marketing literature, the most cited example of means releasing brand POO information is a company's advertising of its brand(s) (Leclerc et al., 1994; Shocker et al., 1994; D'Astous and Ahmed, 1999; Haubl and Elrod, 1999; Clarke et al., 2000; Andrews and Kim, 2007; Pappu et al., 2007). This is what Crespi and Marette (2002) call branded advertising, providing the example of "California Sun Maid" brand advertising. Pace Picante sauce from Texas, Coors beer from Colorado (Takor and Lavack, 2003) and Zespri kiwi from New Zealand (Beverland, 2001) are examples of other brands with POO attributes that have been heavily publicized with mass media advertising. In these cases, advertising has created a strong consumers' association of the brand name, the company ownership or the source of components with the POO attribute. In the agri-food markets, another commonly cited means to release brand information are private third-party certifications (Farina and Reardon, 2000; Giovannucci and Reardon, 2000; Reardon et al., 2001; Konefal et al., 2005). Private third-party certifications are used by food manufacturers and retailers to provide quality, origin and safety assurance to their consumers and therefore to complement their brands (Hatanaka et al., 2005). Although they often proved to be effective, mass media advertising and private certification systems require a large financial investment which is unbearable by the large majority of agri-food firms aiming at differentiating their product from competitors.

Third-party endorsements and appraisals from actors with high status in the marketplace – such as chefs, cultural associations linked to particular territory and journalists in the food sector – are alternative means to provide positive information about an individual brand (Dean, 1999, Huffman et al., 2004; Andrews and Kim, 2007) and so can be classified as providing brand information. As theorized by Podolny (1993),

a seller's social ties with actors with high status in the market can act as signals of product quality or of specific product attributes. Third-party endorsements and appraisals from actors with high market status can isolate a brand from the others as these actors cannot endorse all the brands in the marketplace. However, if they would endorse too many brands, the third-party endorsers would risk losing their own reputation and credibility (Dean, 1999). Similarly to third-party endorsements, the information that a retailer or a buyer with high reputation and an image related to a place of origin, as well as the participation to events, food competitions and fairs related to a place of origin can classify as brand information (Aaker, 1991; Keller, 1993).

In this study, we analyze if attribute information differentiates a brand from its competitors with the same POO attribute or if brand POO information has a higher impact on consumers' beliefs, attitudes and intentions to pay a premium price for a brand relatively to its competing brands.

Consumers' Beliefs, Attitudes and Buying Intentions

According to the learning theory (Fishbein, 1967), consumers' attitudes towards a brand and their decision to buy it are driven by the evaluation of the individual brand attributes. In particular, based upon their prior beliefs and by processing new information, consumers form their evaluations for the single brand attributes and their beliefs that the brand is associated with the attribute (Fishbein, 1967). In the case of POO attributes, for example, consumers form their attitudes towards "Zespri" kiwi brand by assessing how much they like kiwi from New Zealand as well as how much they believe that the brand "Zespri" is really associated with New Zealand kiwis. As POO attributes are credence attributes, which means that they are verifiable by consumers neither before nor after

consumption (Darby and Karni, 1973), information play a key role in determining consumers' beliefs and, in turn, consumers' beliefs are crucial to establish their attitudes towards products (Coswell and Mojduszka, 1996).

However, researchers found that consumers' attitudes towards a brand do not predict buying behavior accurately (Fishbein and Ajzen, 1975). Instead, consumers' attitudes towards the action of buying the brand, moderated by their subjective norms, predict buying intentions much more accurately, as tested in the theory of attitude formation (Fishbein and Ajzen, 1975; Sheppard et al., 1988). Buying intentions predict behavior "unless intent changes prior to performance" or "unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or specificity" (Sheppard et al., 1988). The intention of buying a brand has various dimensions. The most generally accepted is the willingness to do an effort to perform to the buying action (Fishbein and Ajzen, 1975; Eagly and Chaiken, 1993). The nature of such an effort may vary according to the context: it may be the WTP to obtain a product from that brand, the likelihood to pay a premium for that brand, or the likelihood to buy the product even if it is not sold in the most favorite purchasing location. A second key dimension of buying intentions is the choice of the brand among alternatives (Ajzen and Fishbein, 1980), which is the process of comparing and selecting among the intentions associated with each alternatives in the choice set.

Theoretical Framework

To analyze which POO information gives higher consumers' attitudes towards a brand and WTP a premium price and so differentiates a brand from all its competing brands -

including those with the same POO attribute - we propose a theoretical framework that builds upon the learning theory of attitude formation (Fishbein, 1967) and the theory of reasoned action (Fishbein and Ajzen, 1975).

First of all, we assume that both individual firms and collective organizations representing a place of origin can give attribute information, while we assume that only individual firms can give brand information. As a matter of facts, while collective organizations have the incentive of promoting the region they represent as a whole, they should have no incentive to promote individual brands within their region but not the others. Also, we assume that firms generally have lower costs when they provide POO information through a collective organization than by themselves, because of economies of scale in advertising and marketing.

Based upon these assumptions, we first develop hypotheses about attribute POO information. In particular, through the first two hypotheses (H1-H2), we tackle the initial questions: do firms giving attribute POO information create a benefit advantage for their own brand over other brands? Therefore, should an individual firm give attribute POO information or should giving attribute information be an exclusive task of collective inter-firm organizations?

Similarly to previous literature on generic advertising and brand differentiation (Kaiser and Liu, 1998; Crespi and Marette, 2002), we hypothesize that attribute information, either given by an individual firm or an inter-firm organization representing some or all the firms within the POO, have no different impact on consumers' beliefs and attitudes towards competing brands within the same POO, and so does not create any

differentiation among them. In particular, assuming that Firm A owns Brand A and Firm B owns Brand B, we hypothesize:

H1. Given Firm A and Firm B being two firms from the same POO, attribute POO information given by Firm A has no different impact on consumer willingness to pay a premium price for "Brand A" relative to "Brand B".

H2. Given an individual firm owning "Brand A" and a collective inter-firm organization being from the same POO, attribute POO information given by the individual has no different impact than the same information provided by the collective inter-firm organization on the willingness to pay a premium price for "Brand A".

If we found that empirical evidence supporting these two hypotheses, we would then imply that Firm A should not provide attribute information but should let a collective inter-firm organization give this information, whenever the latter exists.

Furthermore, we develop our third and last hypothesis (H3) to compare the impact of brand POO information and attribute POO information on consumers' beliefs and attitudes towards a brand. Similarly to Crespi and Marette (2002), who provide evidence that generic advertising giving attribute information reduce brand differentiation within firms of the same POO, we hypothesize that brand POO information has significantly larger positive impact on consumers' attitudes towards a brand than attribute POO information. However, we hypothesize that this would hold only when consumers have been previously exposed to some attribute POO information, no matter what is the source: consistently with Fishbein (1967), if consumers have strong brand origin associations

relative to a place that they completely ignore, brand POO information may not have a high impact on consumers' attitudes. Therefore, we hypothesize that:

H3. Once consumers have already received attribute POO information, the impact of brand POO information on the willingness to pay for a brand is higher than the impact of any further attribute POO information.

If we found empirical evidence supporting this third hypothesis, we would imply that a firm should give brand POO information to consumers rather than attribute POO information, whenever other firms or a collective inter-firm organization provides attribute POO information.

Methods

To test our hypotheses, we collected data through an internet-based experiment administered to 241 graduate students from Michigan State University. When sending an e-mail advertisement to recruit students to undertake the test, we voluntarily asked for people that "are interested in food from different places and cultures", as we wanted to attract respondents that are highly motivated in learning and potentially buying new products from scarcely known places of origin.

To perform such an experiment, we chose our products of interest using three key criteria. First, we looked for products that, when associated to a particular place of origin, are completely unknown to our sample. In this way, we attempt to give information treatments to respondents that have very weak prior beliefs regarding to the products associated to the POO attribute, as respondents' prior beliefs may largely vary according

to their individual experiences (John et al., 1986). As we expect that prior beliefs are weak, we could assume that respondents' initial beliefs and attitudes towards an unknown product with POO attribute are very similar to each other. Second, we looked for products that are quite regularly used by the majority of consumers, although their familiarity towards the product may largely vary. Third, we looked for products that are commonly promoted with POO information, both by individual firms and national or regional collective associations of producers.

We finally choose Creole cream cheese from Southern Louisiana (USA) and extra-virgin olive oil from Riviera Ligure (Italy) as our products of interest. We found that 85% of our respondents consume olive oil and 75% of them consume cream cheese at least once a month. However, only four of them (i.e., 0.02% of our sample) have heard before about olive oil from Riviera Ligure and only seven of them (i.e., 0.03% of our sample) have heard before Creole cream cheese from Southern Louisiana. Therefore, we assumed that our sample has some basic knowledge of and involvement with olive oil and cream cheese as generic products, while they have weak prior beliefs on these products when associated to places of origin such as Riviera Ligure and Southern Louisiana.

Experimental Procedure

The experiment was conducted in June 2009. Respondents were recruited through an email advertisement by the researchers, with the support of the MSU Office of the Registrar. Each respondent undertook a questionnaire divided in an initial demographics

section plus two sections with information treatments and measurements. Each section of the experiment is used to collect data to test different hypotheses.

In the initial demographics section, respondents were asked preliminary questions about their gender and nationality, as well as their initial attitude towards and their use of olive oil and cream cheese. In the first section, we collect data on the impact of product-level information (H1 and H2). Respondents were divided in four groups: the first group of respondents received firm A's attribute POO information treatment and their POO beliefs, attitudes and buying intentions for Brand A were measured. The second group of respondents received the same treatment as the first group, but their POO beliefs, attitudes and buying intentions were measured for Brand B, which has the same POO attribute. The third group of respondents received a collective inter-firm organization's attribute POO information treatment and their POO beliefs, attitudes and buying intentions for Brand A were measured. Finally, the fourth group received only a brief description of the product with the attribute, and their POO beliefs, attitudes and buying intentions for both Brand A and Brand B were measured. Both firm A's and collective inter-firm organization's attribute POO information were manipulated with a 5-row very positive description of the product together with an information about a POO certification of the product that, as assumed, provided attribute information. Consumers' belief strength of the association between the POO and the brand was measured with a single seven-point Likert-scale item (strongly disagree/strongly agree). Consumers' attitudes were measured with a similar seven-point Likert-scale item, from very negative to very positive. Consumers buying intentions were measured with an individual question such as

"Would you pay a premium to have brand A rather than another brand from the same place-of-origin?", where the possible answers were yes, no or "I don't know".

In the second section of the questionnaire, we collected data on the impact of brand POO information and attribute POO information on consumers' beliefs, attitudes and WTP a premium price. First of all, the group of respondents that did not receive any attribute POO information in section 1 of the experiment received it, such that every respondent received some attribute POO information before the start of section 2. Therefore, respondents were divided in two groups: the first group of respondents was given another firm (say, Firm C)'s product-level POO information, and then their POO beliefs, attitudes and buying intentions for Brand C were measured as in section 1. The second group of respondents was instead given Firm C's *brand* POO information, and then their beliefs, attitudes and buying intentions for Brand C are measured as in section 1. Brand information consists of a set of endorsements to Brand C from a set of information sources (including three sources among private 3rd party certifiers, distributors, chefs, journalists, tasters or non-governmental organizations).

The Model

To establish the relationships among the administered information treatments and the measured variables, we analyzed the data collected with a series of three path models. Each path model is used to evaluate each hypothesis.

A path model represents a set of regressions where independent variables are both exogenous and endogenous, which means that some of them in turn may be being caused by other variables (Hair et al. 2006). In other words, within a path model independent variables in one equation may be dependent variables in another equation. The model is

usually depicted in a circle-and-arrow figure in which single-headed arrows indicate causation. Path analysis requires the usual assumptions of regression. It is particularly sensitive to model specification because failure to include relevant causal variables or inclusion of extraneous variables often substantially affects the path coefficients, which are used to assess the relative importance of various direct and indirect causal paths to the dependent variable. Differently from structural equation models, path models estimate the relationship among measurable variables rather than among latent factors (Hair et al. 2006).

The information treatments administered in our experiment are obviously exogenous variables in these path models. These are modeled as binary variables, named *INFO*, whereas the "0" and "1" values have a different meaning in each path model built. Consistently with the three hypotheses tested, in the first path model the value "0" of the binary variable represents the impact of POO attribute information on "Brand A", while the value "1" represents the impact of POO attribute information on "Brand B". In the second path model, the value "0" of the binary variable represents POO attribute information from an individual firm and the value "1" represents POO attribute information from a collective organization. Finally, in the third path model the value "0" represents POO attribute information from an individual firm, while the value "1" represents POO brand information.

Variables describing respondents' gender, nationality, initial attitudes and habits towards the products are also exogenous variables in the path models, while respondents' beliefs, attitudes and willingness to pay a price premium (WTPP) are endogenous variables. Therefore, the path models can be generically described as:

$$BELSEL = \beta_{11}INFO + \boldsymbol{\beta_{12}DEM} + \boldsymbol{\beta_{13}INIT} + \varepsilon_1 \quad (1)$$

$$BELFLAV = \beta_{21}INFO + \beta_{22}BELSEL + \boldsymbol{\beta_{23}DEM} + \boldsymbol{\beta_{24}INIT} + \varepsilon_2 \quad (2)$$

$$ATT = \beta_{31}INFO + \beta_{32}BELSEL + \beta_{33}BELFLAV + \boldsymbol{\beta_{34}DEM} + \boldsymbol{\beta_{35}INIT} + \varepsilon_3 \quad (3)$$

$$WTPP = \beta_{41}INFO + \beta_{42}BELSEL + \beta_{43}BELSEL + \boldsymbol{\beta_{44}DEM} + \boldsymbol{\beta_{45}INIT} + \varepsilon_4, \quad (4)$$

where BELSEL stands for respondents' beliefs that the branded product is from the most carefully selected product from the place-of-origin, BELFLAV means respondents' beliefs that the branded product has a good flavor, ATT stands for respondents' attitudes towards the brand and WTPP stands for the willingness to pay a premium price for the brand relatively to other brands from the same place of origin[1]. Moreover, **DEM** and **INIT** are vectors of exogenous variables including demographics and initial attitudes and habits of respondents. Finally, the binary variable INFO has a different meaning according to the hypothesis tasted, as described above.

The relationships among these variables are estimated through the path coefficients (βs). These are standardized regression coefficients showing the direct effect of an independent variable on a dependent variable in the path model. Thus when the model has two or more causal variables, path coefficients are partial regression coefficients which measure the extent of effect of one variable on another in the path model controlling for other prior variables. As an intercept is not usually included in path models, βs describe deviations from the mean (Bentler 2004). The residual error terms or disturbance terms, described by ε_1, ε_2, ε_3 and ε_4 reflect unexplained variance plus measurement error.

The path analysis has been conducted with the computer package EQS 6.1 (Bentler, 2004). Satorra-Bentler robust maximum likelihood estimation (MLE) has been

used to obtain path coefficients, as various binary categorical variables are present in the model, including INFO, gender and nationality (Bentler, 2004). The dependent variable WTPP is binary but has been treated as continuous in these path models. Treating a dependent binary variable as continuous gives the opportunity of including it in the path model and so of analyzing the impact of endogenous variables on it, which would have not been possible otherwise (Bentler ,2004). While treating dependent binary variables as continuous is generally inappropriate and can lead to meaningless interpretations (MacCallum et al., 2002), such as estimated probabilities that "1" happens below zero or above 1, this is generally considered as acceptable when the sample size is not too large and the quantity of "1" within the sample is quite low (Bentler, 2004), as it is our sample[2]. Seven-point Likert-scale measured variables have been treated as continuous variables as well, consistently with use largely made in the literature (Likert ,1932; Cronbach, 1950; Peabody, 1962).

Results

With our first path model, we analyze if attribute POO information about a place of origin given by a firm does provide an advantage to its own brand relative to competing brands within the same place of origin. With the second model, we analyze if attribute POO information from a collective organization has a different impact on respondents' WTP a premium from the same type of information from an individual firm. Finally, with our third path model, we analyze if brand POO information has a different impact on respondents' WTP a premium relatively to attribute POO information.

Impact of attribute information on competing brands

Results show that the attribute POO information about Riviera Ligure olive oil does have a significantly higher impact on respondents' willingness to pay a premium for the brand of the firm releasing the information ("Brand A") relatively to other brands from the same place of origin ("Brand B"). The direct effect of a firm giving attribute information on respondents' willingness to pay a premium for "Brand B" relatively to "Brand A" is -0.10 percentage points, while its indirect effect is equal to -0.05 percentage points. As common in path analysis (Bentler 1994), we computed the indirect effect as the sum of the products of all the path coefficients linking the information treatment to the willingness to pay a premium for the brands. The sum between the indirect and the direct effect results in a total causal effect of -0.15 percentage points (see table 3). This means that when attribute information is provided by the firm owning "Brand A", the expected percentage of respondents that are willing to pay a premium for "Brand B" is 15% lower than the mean, that is 25%-15%=10%. The overall fit of this model is very good, with Comparative Fit Index (CFI)=1 and RMSEA=0, and it is comparatively better than the fit of a path model where any direct or indirect path between the information treatment and the final dependent variable is fixed to zero. Based on this evaluation of the goodness-to-fit, we consider this differential impact of attribute POO information on respondents' willingness to pay a premium significant.

In the case of cream cheese, the advantage provided by attribute POO information about Southern Louisiana cream cheese to "Brand A" relatively to "Brand B" is much smaller than in the case of Riviera Ligure olive oil. The total causal effect is equal to -0.02, which is given by the sum of the direct effect (0.06) and the indirect effect (-0.08) (see table 4).

Table 3 - Impact of Attribute Information on Brand A and Brand B Olive Oil

Dependent Variable	Independent Variables	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*5.05*	
	INFO (0=on brand A; 1=on brand b)	**-0.21***	0.18
	MALE	-0.13	0.20
	ATTEVOO	0.23*	0.11
	E1	*0.94*	
BELFLAV	*Mean*	*4.80*	
	INFO (0=on brand A; 1=on brand b)	**0.15***	0.14
	BELSEL	0.66*	0.07
	MALE	0.08	0.14
	EUROPE	0.13	0.89
	E2	*0.75*	
ATT	*Mean*	*5.41*	
	INFO (0=on brand A; 1=on brand b)	**-0.15***	0.14
	BELSEL	0.32*	0.11
	BELFLAV	0.40*	0.09
	MALE	0.13	0.13
	ATTEVOO	0.21	0.07
	E3	*0.66*	
WTPP	*Mean*	*0.25*	
	BELSEL	0.10	0.05
	BELFLAV	0.22	0.05
	ATT	0.16	0.04
	INFO (0=on brand A; 1=on brand b)	**-0.10**	0.07
	MALE	0.18*	0.08
	E4	*0.89*	
ATTEVOO	*Mean*	*6.18*	
	MALE	-0.29*	0.20
	E5	*0.96*	
Indirect Effect of INFO on WTPP		-0.05	
Direct Effect of INFO on WTPP		-0.10	
Total Causal Effect of INFO on WTPP		-0.15	
Satorra-Bentler scaled Chi-Square= 6.68 with 10 d.f.; P-value = 0.76 CFI = 1.000; RMSEA = 0.000; RMSEA 90% Confidence Interval = (0.000; 0.071)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

This means that when the attribute information is provided by the firm owning "Brand A", the expected percentage of respondents that are willing to pay a premium for "Brand B" is 2% lower than the mean, that is 20%-2%=18%. Although the differential impact of attribute POO information on respondents' willingness to pay a premium statistically significant also in the case of cream cheese (as the overall fit of the model is good with CFI = 0.98 and RMSEA = 0.04 and it is comparatively better than with a similar model with path coefficients between INFO and WTPP fixed to zero), we realize that in the case of cream cheese the differential impact of attribute POO information on respondents' willingness to pay a premium for two brands from the same place of origin is not practically significant.

Therefore, we conclude that data evidence does not support the first hypothesis (H1) in the case of olive oil but it supports it in the case of cream cheese. That is, an olive oil firm releasing attribute POO information may expect to obtain an advantage in terms of price premium for its own brand, although the information provided to respondents is about the generic place-of-origin product rather than about the individual brand. On the other hand, a cream cheese firm should not expect to obtain such a market advantage.

The impact of attribute information from a collective organization

Results show that attribute POO information about Riviera Ligure olive oil provided by an individual firm has a significantly higher impact on respondents' willingness to pay a premium for its own brand than the same information provided by a collective organization representing all the firms from the place of origin. The total causal effect of attribute POO information from an individual firm on respondents' willingness to pay a premium for its brand is +0.31 percentage points, which is given by the sum of the direct

Table 4 - Impact of Attribute Information on Brand A and Brand B Cream Cheese

Dependent Variable	Independent Variable	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*4.34*	
	FAMCC	0.37*	0.06
	INFO (0=on brand A; 1=on brand b)	**-0.30***	0.14
	E1	*0.88*	
BELFLAV	*Mean*	*4.59*	
	BELSEL	0.47*	0.10
	INFO (0=on brand A; 1=on brand b)	**0.10***	0.14
	ENJFOOD	0.20	0.05
	E2	*0.87*	
ATT	*Mean*	*4.78*	
	BELSEL	0.16	0.08
	BELFLAV	0.53*	0.08
	INFO (0=on brand A; 1=on brand b)	**-0 .05**	0.12
	ATTCC	0.20*	0.05
	E3	*0.74*	
WTPP	*Mean*	*0.14*	
	BELSEL	0.14	0.05
	BELFLAV	0.13	0.05
	ATT	0.26*	0.05
	INFO (0=on brand A; 1=on brand b)	**0.06**	0.06
	E4	*0.90*	
FAMCC	*Mean*	*2.27*	
	ATTCC	0.48*	0.06
	E5	*0.88*	
Indirect Effect of INFO on WTPP		-0.08	
Direct Effect of INFO on WTPP		+0.06	
Total Causal Effect of INFO on WTPP		**-0.02**	
Satorra-Bentler scaled Chi-Square= 16.86 with 14 d.f.; P-value = 0.263 CFI = 0.982; RMSEA = 0.043; RMSEA 90% Confidence Interval = (0.000; 0.105)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

effect (+0.21) and the indirect effect mediated by respondents' beliefs and attitudes (+0.10) (see table 5). This means that when attribute information is provided by an individual firm, the expected percentage of respondents that are willing to pay a premium for its brand is 31% higher than the expected percentage across groups, that is 17%+31%=48%. As the overall fit of this model is good (CFI=0.98 and RMSEA=0.05) and comparatively better than the fit of a path model where any direct or indirect path between the information treatment and the final dependent variable is fixed to zero, we consider this differential impact of attribute POO information from an individual firm on respondents' willingness to pay a premium significant.

Differently from the case of Riviera Ligure olive oil, in the case of Southern Louisiana cream cheese the impact of attribute information practically does not vary depending on its source. The total causal effect of attribute POO information from an individual firm on respondents' willingness to pay a premium for its brand is less than +0.01 percentage points. This means that, no matter if the attribute POO information about Southern Louisiana cream cheese is provided by an individual firm or by a collective organization, the expected percentage of respondents that are willing to pay a premium for its brand is still 14% (see table 6). Although the difference among information treatments is not practically significant, the overall path model including the information treatment fits the data well (CFI=0.92 and RMSEA=0.075) and comparatively better than a similar model where the individual paths between the information treatment and the final dependent variable are fixed to zero.

Therefore, we conclude that data evidence does not support our second hypothesis (H2) in the case of olive oil but it supports it in the case of cream cheese. That

Table 5 - Impact of Attribute Information from an Individual Firm and from a Collective Organization on Brand Olive Oil

Dependent Variable	Independent Variable	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*5.00*	
	INFO (0=from Coll.Org.; 1=from Firm)	**0.25***	0.18
	MALE	-0.13	0.19
	E1	*0.96*	
BELFLAV	*Mean*	*4.65*	
	BELSEL	0.68*	0.07
	INFO (0=from Coll.Org.; 1=from Firm)	**-0.33**	0.14
	MALE	0.06	0.14
	EUROPE	0.16*	0.69
	E2	*0.73*	
ATT	*Mean*	*5.24*	
	BELSEL	0.50*	0.09
	BELFLAV	0.27*	0.07
	INFO (0=from Coll.Org.; 1=from Firm)	**0.18***	0.13
	MALE	0.10	0.12
	ATTEVOO	0.19*	0.05
	E3	*0.62*	
WTPP	*Mean*	*0.20*	
	BELSEL	0.42	0.05
	BELFLAV	0.21	0.05
	ATT	0.14	0.05
	INFO (0=from Coll.Org.; 1=from Firm)	**0.21***	0.06
	MALE	0.04	0.07
	E4	*0.89*	
Indirect Effect of INFO on WTPP		+0.10	
Direct Effect of INFO on WTPP		+0.21	
Total Causal Effect of INFO on WTPP		**+0.31**	
Satorra-Bentler scaled Chi-Square = 16.08 with 12 d.f.; P-value = 0.19 CFI = 0.978; RMSEA = 0.053; RMSEA 90% Confidence Interval = (0.000; 0.112)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

Table 6 - Impact of Attribute Information from an Individual Firm and from a Collective Organization on Brand A Cream Cheese

Dependent Variable	Independent Variable	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*4.43*	
	INFO (0=from Coll.Org.; 1=from Firm)	**-0.26***	0.14
	SOUTHAM	0.18*	0.36
	ATTCC	0.29*	0.05
	E1	*0.90*	
BELFLAV	*Mean*	*4.59*	
	BELSEL	0.47*	0.10
	ENJFOOD	0.20*	0.05
	INFO (0=from Coll.Org.; 1=from Firm)	**0.10**	0.13
	E2	*0.87*	
ATT	*Mean*	*4.78*	
	BELSEL	0.19*	0.08
	BELFLAV	0.49*	0.09
	ENJFOOD	0.13	0.04
	ATTCC	0.19*	0.05
	E3	*0.72*	
WTPP	*Mean*	*0.14*	
	BELSEL	0.14	0.05
	BELFLAV	0.13	0.05
	ATT	0.26*	0.05
	INFO (0=from Coll.Org.; 1=from Firm)	**0.06**	0.06
	E4	*0.90*	
FAMCC	*Mean*	*2.26*	
	ATTCC	0.48*	0.06
	E5	*0.88*	
ENJFOOD	*Mean*	*5.98*	
	SOUTH	-0.20*	1.41
	E6	*0.98*	
Indirect Effect of INFO on WTPP		-0.05	
Direct Effect of INFO on WTPP		+0.06	
Total Causal Effect of INFO on WTPP		**+0.01**	
Satorra-Bentler scaled Chi-Square = 32.69 with 20 d.f.; P-value = 0.036 CFI = 0.920; RMSEA = 0.075; RMSEA 90% Confidence Interval = (0.019; 0.120)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

is, an olive oil firm may expect to obtain a larger advantage in terms of price premium for its brand when it releases attribute POO information rather than when the same information is released by a collective organization representing a group of firms from the same place of origin. On the other hand, a cream cheese firm should not expect to obtain a larger market advantage when providing attribute information on its own rather than letting a collective organization representing them providing the same to respondents.

The impact of brand information

Results show that brand POO information about a Riviera Ligure olive oil brand has a significantly higher impact on respondents' willingness to pay a premium for its own brand than attribute POO information about generic Riviera Ligure olive oil. The total causal effect of brand POO information is +0.27 percentage points, which is given by the sum of the direct effect (+0.17) and the indirect effect mediated by respondents' beliefs and attitudes (+0.10) (see table 7). This means that an individual firm provides brand information to a group of respondents, the expected percentage of respondents that are willing to pay a premium for its brand is 27% higher than the expected percentage across groups, that is 17%+27%=44%. The good overall fit of the model with the data both in absolute terms (CFI=0.93 and RMSEA=0.075) and relatively to a path model where any direct or indirect path between the information treatment and the final dependent variable is fixed to zero indicate that the differential impact of brand and attribute POO information respondents' WTP a premium is statistically significant.

Table 7 - Impact of Attribute Information and Brand Information on Brand A Olive Oil

Dependent Variable	Independent Variable	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*4.71*	
	INFO (0=attribute info; 1=brand info)	**0.19***	0.13
	MALE	-0.12*	0.14
	ASIA	0.12	0.22
	ATTEVOO	0.19*	0.07
	E1	*0.95*	
BELFLAV	*Mean*	*4.79*	
	BELSEL	0.56*	0.05
	INFO (0=attribute info; 1=brand info)	**0.15***	0.10
	FAMEVOO	0.16*	0.04
	MALE	-0.10*	0.11
	EUROPE	0.10*	0.35
	E2	*0.74*	
ATT	*Mean*	*5.03*	
	BELSEL	0.29*	0.06
	BELFLAV	0.47*	0.06
	ATTEVOO	0.09*	0.04
	E3	*0.70*	
WTPP	*Mean*	*0.17*	
	BELSEL	0.18*	0.03
	BELFLAV	0.22*	0.04
	ATT	0.03	0.03
	INFO (0=attribute info; 1=brand info)	**0.17***	0.04
	MALE	0.12*	0.05
	E4	*0.89*	
FAMEVOO	*Mean*	*2.81*	
	ATTEVOO	0.46*	0.06
	EUROPE	0.12*	0.30
	ASIA	-0.11	0.26
	E5	*0.86*	
ATTEVOO	*Mean*	*6.05*	
	MALE	-0.13*	0.14
	ASIA	-0.14*	0.25
	E6	*0.98*	
Indirect Effect of INFO on WTPP		+0.10	
Direct Effect of INFO on WTPP		+0.17	
Total Causal Effect of INFO on WTPP		**+0.27**	
Satorra-Bentler scaled Chi-Square = 53.65 with 23 d.f.; P-value = 0.000 CFI = 0.932; RMSEA = 0.075; RMSEA 90% Confidence Interval = (0.049; 0.100)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

Table 8 - Impact of Attribute Information on Brand A Cream Cheese

Dependent Variable	Independent Variable	Standardized Path Estimates	Std. Errors
BELSEL	*Mean*	*4.52*	
	INFO (0=attribute info; 1=brand info)	**0.08**	0.10
	MALE	-0.17*	0.11
	EUROPE	0.15*	0.11
	AFRICA	0.13*	0.05
	E1	*0.96*	
BELFLAV	*Mean*	*4.73*	
	BELSEL	0.51*	0.06
	INFO (0=attribute info; 1=brand info)	**0.01**	0.10
	EUROPE	-0.10	0.09
	EVPOO	-0.10	0.03
	ENJFOOD	0.15*	0.03
	E2	*0.84*	
ATT	*Mean*	*4.79*	
	BELSEL	0.38*	0.07
	BELFLAV	0.29*	0.07
	INFO (0=attribute info; 1=brand info)	**0.07**	0.09
	SOUTHAM	0.08	0.17
	ATTCC	0.17*	0.04
	E3	*0.78*	
WTPP	*Mean*	*0.18*	
	BELSEL	-0.02	0.04
	BELFLAV	0.08	0.03
	ATT	0.24*	0.03
	FAMCC	0.21*	0.02
	INFO (0=attribute info; 1=brand info)	**0.13***	0.05
	AFRICA	0.14*	0.06
	ATTCC	-0.14*	0.02
	E4	*0.92*	
FAMCC	*Mean*	*2.47*	
	ATTCC	0.47*	0.04
	E5	*0.88*	
Indirect Effect of INFO on WTPP		+0.03	
Direct Effect of INFO on WTPP		+0.13	
Total Causal Effect of INFO on WTPP		**+0.16**	
Satorra-Bentler scaled Chi-Square = 81.57 with 56 d.f.; P-value = 0.014 CFI = 0.912; RMSEA = 0.044; RMSEA 90% Confidence Interval = (0.020; 0.063)			

Note: The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

Similarly to the case of Riviera Ligure olive oil, the impact of brand POO information about a Southern Louisiana cream cheese brand is also significantly higher than the impact of attribute POO information. The total causal effect of brand POO information on respondents' WTP a premium for its brand is +0.16 percentage points. This means that when a Southern Louisiana cream cheese firm provides brand information to a group of respondents, the expected percentage of respondents that have a WTP a premium for that brand relatively to other cream cheese brands from Southern Louisiana is 34%, which is a percentage 16% points higher than the mean across groups of respondents receiving either brand or attribute information (see table 8). The overall path model including the information treatment fits the data well (CFI=0.92 and RMSEA=0.075) and comparatively better than a similar model where the individual paths between the information treatment and the final dependent variable are fixed to zero.

We conclude that data evidence does support our third hypothesis (H3) both in the case of Riviera Ligure olive oil and Southern Louisiana cream cheese. That is, a firm producing either olive oil or cream cheese should expect to obtain a larger advantage in terms of price premium for its brand when it releases brand POO information rather than attribute information, when the information recipient has already received some information about the generic place-of-origin product.

Conclusions

Agricultural economics literature largely explored the effect of generic advertising and collective certification schemes on consumers' evaluations for an entire place-of-origin

product category, but rarely studied how a firm can create a competitive advantage for its individual brand relatively to the other brands *within* the same place of origin. Borrowing from the theory of attitude formation developed in the field of psychology (Fishbein, 1967; Fishbein and Ajzen, 1975), in this study we attempted to start filling this gap by analyzing which place-of-origin information increases consumers' buying intentions for an individual brand while differentiating it from the other brands from the same place-of-origin. We introduced a distinction between attribute and brand place-of-origin information, which differ in the objective of their messages. While the former aims at increasing consumers' evaluation towards the place-of-origin attribute, the latter strengthens the association between a specific brand and the place-of-origin.

By building upon the distinction between attribute and brand information and on the basis of the data evidence from the experiment conducted, we obtained three main findings from this study. First, when developing an olive oil brand with a place-of-origin attribute, a firm can obtain a market advantage in terms of consumers' WTP a premium price by providing attribute information on its own. On the other hand, when developing a cream cheese brand with a place-of-origin attribute, a firm does not obtain a market advantage over the other brands from the same place of origin when providing attribute information. In this case, assuming that performing communication and promotion activities is cheaper collectively than individually, a firm should choose to provide attribute information as part of a collective organization. Finally, when providing brand place-of-origin information to potential consumers that have already received some information about a regional product, a firm obtains a significantly higher percentage of

information recipients that are willing to pay a premium for its brand rather than when providing attribute information.

We believe that these findings could be generalized further from the specific cases of olive oil and cream cheese. One way to interpret the different impact of attribute information on potential consumers' buying intentions across olive oil and cream cheese is that olive oil can be considered a "credence good" (Darby and Karni, 1973), i.e. a product whose perceived quality is strongly related to intangible attributes such as the place of origin, while cream cheese can be considered an "experience good", i.e. a product whose perceived quality more strongly depends on tangible quality attributes (such as flavor, color, texture). Given the nature of credence goods, information about the product and the source of information has a higher impact on consumers' evaluation than in the case of experience goods, where instead the product trial is crucial to determine consumers' evaluations (Darby and Karni, 1973). Further research may verify if this interpretation generalizing further the cases of olive oil and cream cheese holds or not by testing the same hypotheses in the case of other "credence goods" and "experience goods".

There are two major limitations in this research that could be overcome in future research. First, we established only if potential consumers have higher attitudes towards brands or the WTP a premium price for them, but we did not try to estimate how much they are willing to pay more when they receive POO information. By estimating the impact of various types of POO information on consumers' WTP, future research may provide a quantitative insight on the benefits of various branding strategies for an agri-food firm. Second, we crafted the brand POO information treatments on Riviera Ligure

olive oil and Southern Louisiana cream cheese by composing a set of information reported from a heterogeneous set of sources, including retailers, opinion leaders' endorsements and food competition awards won. We estimated the impact of the treatment as a whole, without trying to estimate the marginal impact of each piece of information depending on its source. By estimating the marginal impact of different sources of information about a place of origin, future research may also provide insights on the factors determining variation of the marginal impact of information sources on consumers' attitudes and buying intentions for agri-food products with POO attributes.

Footnotes

[1] We decided to model *WTPP* as a binary variable, where the value "1" stands for respondents that are willing to pay a premium price, where the value "0" stands for respondents that have answered either "no" or "I don't know". We decide to count the "I don't know" responses as "0" values because, although the percentage of participants responding "I don't know" is around 30%, from a t-test we found no significant variation in the change of this percentage across groups.

[2] To evaluate the appropriateness of treating the dependent binary variable WTPP as continuous, we also checked and found that results are stable when we excluded WTPP from our path model and had only the 7-point scale ATT as dependent variable.

Appendix B

SURVEY INSTRUMENT – CHAPTER 2

Food Values

1. When I choose the food I eat, an important thing I consider is the country or region where it is produced.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

2. I enjoy discovering and tasting food from other regions of the world.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

3. How would you describe your attitude towards extra-virgin olive oil in general on a scale from very negative (1) to very positive (7)?

Very Negative						Very Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

4. Have you ever heard about or tasted an extra-virgin olive oil from Riviera Ligure?

Yes	No	I don't remember
○	○	○

5. How would you describe your attitude towards cream cheese in general from a very negative (1) to very positive (7)?

Very Negative						Very Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

6. Have you ever heard about or tasted Creole Cream Cheese from Southern Louisiana?

Yes	No	I don't know
○	○	○

Familiarity with Cream Cheese

Please answer the following questions about cream cheese. Feel free to leave the spaces blank whenever you do not know what to answer in the open questions.

7. How frequently do you consume cream cheese, including both home and away from home?

Never	Less than once a month	Once a month	2-3 times a month	Once a week	2-3 times a week	Daily
○	○	○	○	○	○	○

8. How knowledgeable are you about the quality of cream cheese?

Very Unknowledgeable 1	2	3	4	5	6	Very Knowledgeable 7
○	○	○	○	○	○	○

9. Do you presently have some cream cheese with you at home?

○ No

○ Yes

10. Please list up to five brands of cream cheese that you have heard (for example, "Philadelphia" brand).

    You can leave the fields blank if you do not know the answer.

Brand 1
Brand 2
Brand 3
Brand 4
Brand 5

11. Please list up to three attributes that you consider DURING your consumption of cream cheese to evaluate its quality (for example, its flavor).

You can leave the fields blank if you do not know.

1
2
3

12. Please list up to three attributes that you consider BEFORE your consumption of cream cheese to evaluate its quality (for example, its color).

You can leave the fields blank if you do not know.

1
2
3

13. Please list up to three pieces of information on the label of a cream cheese that you consider when you evaluate its quality (for example, if it is organic or not).

You can leave the fields blank if you do not know.

1
2
3

14. Does cream cheese from England have higher quality than cream cheese from Italy, or vice versa?

- ○ Cream cheese from England has higher quality
- ○ Cream cheese from Italy has higher quality
- ○ It depends
- ○ I don't know

15. In the Lansing area, name up to five stores that you can think of that carry a wide selection of "specialty cream cheeses".

You can leave the fields blank if you do not know the answer.

Store 1 _____
Store 2 _____
Store 3 _____
Store 4 _____
Store 5 _____

16. In which specific country of the world are these cream cheese varieties traditionally produced?

You can leave the fields blank if you do not know the answer.

Neufchâtel _____
Mascarpone _____

Familiarity with Olive Oil

Please answer the following questions about extra-virgin olive oil (for simplicity, we will just call it "olive oil"). Feel free to leave the spaces blank whenever you do not know what to answer in the open questions.

17. How frequently do you consume olive oil, including both home and away from home?

Never	Less than once a month	Once a month	2-3 times a month	Once a week	2-3 times a week	Daily
○	○	○	○	○	○	○

18. How knowledgeable are you about the quality of olive oil?

Very Unknowledgeable 1	2	3	4	5	6	Very Knowledgeable 7
○	○	○	○	○	○	○

19. Do you presently have some olive oil with you at home?

○ Yes

○ No

20. Please list up to five brands of olive oil that you may know (for example, "Bertolli" olive oil brand).

You can leave these fields blank if you do not know the answer.

Brand 1 _____

Brand 2 _____

Brand 3 _____

Brand 4 _____

Brand 5 _____

21. Please list up to three attributes that you consider DURING your consumption of olive oil to evaluate its quality (for example, its flavor).

You can leave some fields blank if you do not know.

1 _____

2 _____

3 _____

22. Please list up to six pieces of information on the label of an olive oil bottle that you consider when you evaluate the quality of an olive oil (for example, if weather it is obtained from hand-picked olives or not).

You can leave some fields blank if you do not know.

1 _____
2 _____
3 _____
4 _____
5 _____
6 _____

23. Does olive oil from California have higher quality than olive oil from France, or vice versa?

- ○ Olive oil from California has higher quality
- ○ Olive oil from France has higher quality
- ○ It depends
- ○ I don't know

24. In the Lansing area, name up to five stores that you can think of that carry a wide selection of "specialty olive oil".

You can leave some fields blank if you do not know.

Store 1 _____
Store 2 _____
Store 3 _____
Store 4 _____
Store 5 _____

25. In which specific country of the world are these olive varieties traditionally produced?

You can leave the fields blank if you do not know the answer.

Frantoio _____
Kalamata _____

Treatment 1: Firm A's Attribute-Level Information

Please read the following piece of information on extra-virgin olive oil.

"Pietrantica" is an extra-virgin olive oil from Riviera Ligure.

Riviera Ligure is an astonishing Italian region where mountains touch the sea, little fisherman villages keep their ancient beauty and olive trees grow in stone-made terraces.

"Pietrantica" extra-virgin olive oil carries a Protected Denomination of Origin (P.D.O.).

Contrary to other oils on the market, Protected Denomination of Origin (P.D.O.) products are always subject to checks in the field, documentary verification, sensorial and chemical-physical analyses and, only upon completion of this sequence of controls may an oil bear that precious European Community label.

Therefore, consumers can be sure that "Pietrantica" extra-virgin olive oil is obtained from the healthiest and carefully selected olives of the Riviera Ligure.

A picture with Olive Oil and Olive Field Landscape is placed here[1].

Measurement 1: Beliefs, Attitudes and Buying Intentions

Please respond to the following questions about the "Pietrantica" P.D.O. extra virgin olive oil from Riviera Ligure.

26. How would you describe your attitude towards the "Pietrantica" P.D.O. extra virgin olive oil from Riviera Ligure?

Very Negative						Very Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Please rate to what extent you agree or disagree with the following statement.

27. I believe that "Pietrantica" extra virgin olive oil is obtained from the most carefully selected olives of Riviera Ligure.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

28. I believe that "Pietrantica" extra virgin olive oil has a great flavor.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

29. Would you pay a higher price for "Pietrantica" compared to another extra virgin olive oil from Riviera Ligure?

Yes	No	I don't know
○	○	○

30. Would you pay a higher price for "Pietrantica" compared to another Protected Denomination of Origin (P.D.O.) extra virgin olive oil from Riviera Ligure?

Yes	No	I don't know
○	○	○

31. Would you pay a higher price for a P.D.O. extra virgin olive oil rather than for a non-P.D.O. extra virgin olive oil from Riviera Ligure?

Pay more for P.D.O.	Pay the same	I don't know
○	○	○

Treatment 2: Firm C's Brand-Level Information

Now please read this other piece of information on extra-virgin olive oil.

The Cipriani Hotel in Venice, the Orient Express luxury train, the Splendido Hotel in Portofino, the Quirisana Hotel in Capri... "Costa dei Rosmarini" is a delicate extra-virgin olive oil from Riviera Ligure chosen by the best Chefs and the most elegant Hotels in Italy. "Costa dei Rosmarini" has been also received a special mention from the famous Michelin restaurant guide. It has been already chosen by top gourmet shops such as Whole Foods, Harrods in London and La Grande Epicerie in Paris.

This is the result of four decades of work and passion for olives of the Petrelli family, that obtains their "Costa dei Rosmarini" extra virgin olive oil from the most healthy and carefully selected olives of Riviera Ligure.

A picture with a chef cooking with olive oil is placed here.

A Whole Foods Market logo is placed here.

A Venice Simplon Orient-Express logo is placed here.

A picture with olive oil farmer and olive oil tree is placed here.

Measurement 2: Beliefs, Attitudes and Buying Intentions

Please respond to the following questions about the "Costa dei Rosmarini" extra virgin olive oil from Riviera Ligure.

32. How would you describe your attitude towards the "Costa dei Rosmarini" extra virgin olive oil from Riviera Ligure?

Very Negative						Very Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Please rate to what extent you agree or disagree with the following statement.

33. I believe that "Costa dei Rosmarini" extra virgin olive oil is really obtained from the most carefully selected olives of Riviera Ligure.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

34. I believe that "Costa dei Rosmarini" extra virgin olive oil has a great flavor.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

35. I believe that "Costa dei Rosmarini" extra virgin olive oil has a great flavor.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

36. Would you pay a higher price for "Costa dei Rosmarini" compared to another extra virgin olive oil from Riviera Ligure?

Yes	No	I don't know
○	○	○

37. Would you pay a higher price for "Costa dei Rosmarini" compared to a Protected Denomination of Origin (P.D.O.) extra virgin olive oil from Riviera Ligure?

Yes	No	I don't know
○	○	○

Treatment 1 Cheese: Collective Organization's Attribute-Level Information

Now please read the following piece of information on cream cheese.

The Louisiana Dairy Products Association is proud to promote the Creole Cream Cheese, a legendary local delicacy from Southern Louisiana.

Whether eaten as a part of a meal savory or sweet, Creole Cream Cheese is a celebrated part of the New Orleans culinary tradition that dates back 150 years to the region's first French settlers. This cheese is similar to Neufchatel and other fresh farmhouse style cheeses with a taste somewhere between ricotta and crème fraiche, and with an underlying hint of buttermilk. Creole Cream Cheese is customarily served with a sprinkle of sugar, drizzle of syrup, or mixed with fresh fruit, as well as eaten spread on bread or crackers.

Today, the authentic Creole Cream Cheese from Southern Louisiana carries the "Real Louisiana Cheese seal", adopted as part of a strategic promotion effort for the Louisiana cheese industry.

The "Real Louisiana Cheese" is a certification mark that assures consumers they are purchasing natural cheese, made in Southern Louisiana exclusively with Southern Louisiana milk. With this seal, the Louisiana Dairy Products Association has been able to consistently and effectively promote many styles and varieties of cheese from Louisiana cheesemakers who qualify for and use it on their packaging.

A picture of cream cheese with strawberries is placed here.

Measurement 1 Cheese: Brand A

"Mauthe's Dairy" is a Creole Cream Cheese from Southern Louisiana that carries the "Real Louisiana Cheese seal".

Please respond to the following questions about the "Mauthe's Dairy" Creole Cream Cheese from Southern Louisiana.

38. How would you describe your attitude towards the "Mauthe's Dairy" certified Creole Cream Cheese from Southern Louisiana?

Very Negative						Very Positive
1	2	3	4	5	6	7
○	○	○	○	○	○	○

Please rate to what extent you agree or disagree with the following statement.

39. I believe that "Mauthe's Dairy" certified Creole Cream Cheese is obtained from the most carefully selected milk of Southern Louisiana.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7
○	○	○	○	○	○	○

40. Would you pay a higher price for "Mauthe's Dairy" Creole Cream Cheese compared to any other Creole Cream Cheese from Southern Louisiana?

Yes	No	I don't know
○	○	○

41. I believe that "Mauthe's Dairy" certified Creole Cream Cheese has a great flavor.

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

42. Would you pay a higher price for "Mauthe's Dairy" Creole Cream Cheese compared to another "Real Louisiana Cheese"-certified Creole Cream Cheese?

Yes	No	I don't know
○	○	○

43. Would you pay a higher price for a "Real Louisiana Cheese"-certified Creole Cream Cheese rather than for a non-certified Creole Cream Cheese?

Pay more for "Real Louisiana Cheese"-certified	Pay the same	I don't know
○	○	○

Treatment 2 Cheese: Firm C's Attribute-Level Information

Now please read this last piece of information on cream cheese.

"Bittersweet" is another Creole Cream Cheese from Southern Louisiana.

This farmer's-style cheese indigenous to Southern Louisiana is made with a blend of skim milk and half & half cream. This style of cheese was brought to Southern Louisiana, many think, from the Brittany and Burgundy regions of France and became extremely popular in New Orleans from the 1800s to the 1980s when production ceased. We resurrect this Creole icon for your enjoyment. It is best eaten with a sprinkle of sugar or fresh fruit.

A picture with cream cheese and strawberries is placed here.

Measurement 2 Cheese: Brand C

Please respond to the following questions about the "Bittersweet" Creole Cream Cheese from Southern Louisiana.

44. How would you describe your attitude towards the "Bittersweet" Creole Cream Cheese from Southern Louisiana?

Very Negative 1	2	3	4	5	6	Very Positive 7
○	○	○	○	○	○	○

Please rate to what extent you agree or disagree with the following statement.

45. I believe that "Bittersweet" Creole Cream Cheese is obtained from the most carefully selected milk of Southern Louisiana.

Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
○	○	○	○	○	○	○

46. Would you pay a higher price for "Bittersweet" Creole Cream Cheese compared to any other Creole Cream Cheese from Southern Louisiana?

Yes	No	I don't know
○	○	○

47. Would you pay a higher price for "Bittersweet" Creole Cream Cheese compared to another "Real Louisiana Cheese"-certified Creole Cream Cheese?

Yes	No	I don't know
○	○	○

Footnotes

[1]To have access to the pictures in the questionnaire or to the original questionnaire with the pictures, please contact the author at dentonid@msu.edu.

Appendix C

OTHER TREATMENTS – CHAPTER 2

In this appendix, I provide the information treatments that did not appear in the survey instrument for Group 1 but that were administered to either Group 2, 3 or 4. Each treatment was presented to respondents within the same page.

Attribute Information from Multi-Firm Organization (Olive Oil)

Please read the following piece of information on extra-virgin olive oil.

Founded in 2001, the Riviera Ligure olive oil Consortium, with the strength deriving from the participation of the olive growers, presses and bottlers, is enthusiast to promote and protect the reputation of the extra-virgin olive oil from Riviera Ligure to offer consumers an oil of a quality sought by connoisseurs.

Riviera Ligure is an astonishing Italian region where mountains touch the sea, little fisherman villages keep their ancient beauty and olive trees grow in stone-made terraces.

Today, the authentic extra-virgin olive oil from Riviera Ligure is certified the "Protected Denomination of Origin" (P.D.O.), which controlled and promoted by the Riviera Ligure olive oil Consortium.

Contrary to other oils on the market, Protected Denomination of Origin (P.D.O.) products are always subject to checks in the field, documentary verification, sensorial and chemical-physical analyses and, only upon completion of this sequence of controls may an oil bear that precious European Community label.

Therefore, consumers can be sure that P.D.O. extra-virgin olive oil is obtained from the healthiest and carefully selected olives of the Riviera Ligure.

A picture with olive oil and landscape is placed here.

Attribute Information Treatment from Individual Firm (Olive Oil)

Now please read this other piece of information on extra-virgin olive oil.

"Costa dei Rosmarini" is another extra virgin olive oil from Riviera Ligure. Here is a description that the Petrini family, producers of "Costa dei Rosmarini", give about their extra-virgin olive oil.

From Capo Cervo to the border with France, Riviera Ligure is a continuum of bays, traditional ports and rocks on the sea that suddenly become valleys and mountain peaks. Riviera Ligure's history is rooted in a tradition in which the production of olive oil has played a central role for thousands of years. The "taggiasca" tree produces a unique olive and imparts Riviera Ligure olive oil with a full, delicate and well-rounded flavor, and a deep color.

Here in Riviera Ligure, everything is different. Time does not matter. Also people are different: they built miles of stone walls to sustain stripes of cultivations all along the steepest mountains. They found the space for little squares of land among mountains, and took care of the hard soil for centuries to plant olives. And this produced a wonder: the extra-virgin olive oil.

In this magnificient land, Riviera Ligure, the Petrini family produces the "Costa dei Rosmarini" extra-virgin olive oil.

A picture with olive oil farmer and olive oil tree is placed here.

Attribute Information Treatment from Individual Firm (Cream Cheese)

Now please read this piece of information on cream cheese.

"Mauthe's Dairy" is a Creole Cream Cheese, a legendary local delicacy from Southern Louisiana.

Whether eaten as a part of a meal savory or sweet, Creole Cream Cheese is a celebrated part of the New Orleans culinary tradition that dates back 150 years to the region's first French settlers. This cheese is similar to Neufchatel and other fresh farmhouse style cheeses with a taste somewhere between ricotta and crème fraiche, and with an underlying hint of buttermilk. Creole Cream Cheese is customarily served with a sprinkle

of sugar, drizzle of syrup, or mixed with fresh fruit, as well as eaten spread on bread or crackers.

Today, the "Mauthe's Dairy" Creole Cream Cheese from Southern Louisiana also carries the "Real Louisiana Cheese" seal.

The "Real Louisiana Cheese" is a certification mark that assures consumers they are purchasing natural cheese, made in Southern Louisiana exclusively with Southern Louisiana milk. With this seal, the Louisiana Dairy Products Association has been able to consistently and effectively promote many styles and varieties of cheese from Louisiana cheesemakers who qualify for and use it on their packaging.

A picture with cream cheese and strawberries is placed here.

Treatment 2 Cheese: Firm C's Brand-Level Information (Cream Cheese)

Now please read this last piece of information on cream cheese.

As the primary producer of Artisan cheeses showcasing Louisiana's rich culinary heritage, "Bittersweet" Dairy produces a Creole Cream Cheese that synthesizes the finest flavors of the Creole culinary heritage.

"Bittersweet" Creole Cream Cheese is delighting America. This year, "Bittersweet" won the prestigious American Artisanal Treasure Award and the "Butters Up" American Cheese Society Award. Chef John Folse, who crafted the best Creole Cream Cheese recipe for "Bittersweet", received the Southern Foodways Alliance Lifetime Achievement Award for his creation!

"Bittersweet" Creole Cream Cheese has been selected by top specialty stores such Whole Foods Market, the famous Artisan Cheese Gallery in San Francisco, the Cheese Store of Beverly Hills, and obviously the finest delis of New Orleans.

"Bittersweet" is the result of 150 years of passion in producing cream cheese and Creole culinary heritage.

A picture with cream cheese producer winning an award is placed here.

A Whole Foods Market is placed here.

An Artisan Cheese Gallery is placed here.

A picture with cream cheese and strawberries is placed here.

Appendix D

METHODOLOGICAL NOTE – CHAPTER 2

This methodological note provides a detailed report of the analysis conducted in Chapter 2. Results obtained from the path analysis described within the chapter are derived after undertaking the following intermediate steps:

- Path analysis without demographic and attitudinal predictors;
- Path analysis with demographic and attitudinal predictors;
- Test of robustness of results with and without the WTPP variable;
- Computation of Total Causal Effects of INFO on WTPP.

This methodological note presents the steps undertaken only with respondents' data on Liguria extra-virgin olive oil. The same steps have been undertaken with respondents' data on Southern Louisiana cream cheese. The entire analysis has been performed with the structural equation program EQS, copyright by P.M. Bentler, Multivariate Software, Inc., Version 6.1, 1985-2006 (B91).

Path analysis without demographic and attitudinal predictors

Building path models without demographic and attitudinal predictors is a preliminary step to analyze if the results on the impact of information treatments are supporting hypotheses without control variables and how much variance of dependent variables remains unexplained before inserting the control variables in the model (Hair et al., 2006). Table 9, 10 and 11 illustrate the results that test respectively the three hypotheses of this study.

Table 9 - Simple path model testing hypothesis 1, Liguria olive oil

Dependent Variable	Independent Variables	Standardized Path Estimates
BELSEL	*Mean*	*5.04*
	INFO (0=on brand A; 1=on brand b)	**-0.40***
	E1	*0.90**
BELFLAV	*Mean*	*4.79*
	INFO (0=on brand A; 1=on brand b)	**0.64***
	BELSEL	0.30*
	E2	*0.99**
ATT	*Mean*	*5.41*
	INFO (0=on brand A; 1=on brand b)	**-0.30***
	BELSEL	0.34*
	BELFLAV	0.42*
	E3	*0.70**
WTPP	*Mean*	*0.25*
	BELSEL	0.02
	BELFLAV	0.09
	ATT	0.08
	INFO (0=on brand A; 1=on brand b)	**-0.10**
	E4	*0.28**
Chi-square .000 based on -4 d.f. CFI = 0.942.		

Note: Chi-square is null and degrees of freedom are negative because the model is under-identified. The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

Table 10 - Simple path model testing hypothesis 2, Liguria olive oil

Dependent Variable	Independent Variables	Coefficients
BELSEL	*Mean*	*5.00*
	INFO (0=from Coll.Org.; 1=from Firm)	**0.52***
	E1	*0.85**
BELFLAV	*Mean*	*4.65*
	INFO (0=from Coll.Org.; 1=from Firm)	**0.08**
	BELSEL	0.66*
	E2	*1.0*
ATT	*Mean*	*5.24*
	INFO (0=from Coll.Org.; 1=from Firm)	**0.48***
	BELSEL	0.48*
	BELFLAV	0.29*
	E3	*0.59**
WTPP	*Mean*	*0.20*
	BELSEL	0.01
	BELFLAV	0.08
	ATT	0.05
	INFO (0=from Coll.Org.; 1=from Firm)	**0.17***
	E4	*0.94**
Chi-square .000 based on -4 d.f. CFI = 0.937.		

Note: Chi-square is null and degrees of freedom are negative because the model is under-identified. The asterisk (*) indicates significance at 95% level; the **bold** font highlights the major variable of interest INFO.

Table 11 - Simple path model testing hypothesis 3, Liguria Olive Oil

Dependent Variable	Independent Variables	Coefficients
BELSEL	*Mean*	*4.71*
	INFO (0=attribute info; 1=brand info)	**0.44***
	E1	*1.00**
BELFLAV	*Mean*	*4.79*
	INFO (0=attribute info; 1=brand info)	**0.38**
	BELSEL	0.59
	E2	*0.78*
ATT	*Mean*	*5.03*
	INFO (0=attribute info; 1=brand info)	**0.03**
	BELSEL	0.28
	BELFLAV	0.49
	E3	*1.14*
WTPP	*Mean*	*0.17*
	BELSEL	0.06
	BELFLAV	0.07
	ATT	0.01
	INFO (0=attribute info; 1=brand info)	**0.14**
	E4	*2.85*
Chi-square .000 based on -4 d.f. CFI = 0.960.		

Table 11 – Simple path model testing hypothesis 3, Liguria olive oil

Note: Chi-square is null and degrees of freedom are negative because the model is under-identified; The asterisk (*) indicates significance at 95% level; the **bold font** highlights the major variable of interest INFO.

These three models are under-identified as there are too many parameters to be estimated compared to the known variables. As predictors are added to the model, the number of known variables relative to free parameters to be estimated increases and the model becomes identified.

Path analysis with demographic and attitudinal predictors

First, an initial model is tested controlling for all the predictors available, including respondents' gender, origin, food values and familiarity with the product.

After evaluating this initial model by observing the goodness-to-fit and after identified and dropping the parameters that do not contribute to make the chi-square decrease with the Wald test, the following second model is tested:

$$BELSEL = \beta_{11}INFO + \varepsilon_1; \quad (1)$$

$$BELFLAV = \beta_{21}BELSEL + \beta_{22}INFO + \beta_{23}EUROPE + \beta_{24}MALE + \varepsilon_2; \quad (2)$$

$$ATT = \beta_{31}BELSEL + \beta_{32}BELFLAV + \beta_{33}INFO + \beta_{34}MALE + \beta_{35}ATTEVOO + \varepsilon_3; \quad (3)$$

$$WTPP = \beta_{41}BELSEL + \beta_{42}BELFLAV + \beta_{43}ATT + \beta_{44}INFO + \beta_{45}MALE + \varepsilon_4. \quad (4)$$

This model does not have a perfect fit with data, as chi-square is 29.81 with d.f. and its p-value < 0.01, but the multivariate LM test suggests that freeing the path coefficients of the variables MALE on ATTEVOO, MALE on BELSEL and ATTEVOO on BELSEL would improve the goodness-to-fit by dropping the chi-square of 10.34, 4.98 and 9.44 points, respectively.

Therefore, a third unrestricted model is run, where these three path coefficients are freed, which is presented in Table 3 and interpreted in the chapter text. The same

procedure of goodness-to-fit evaluation and application of suggestions from Wald test and LM test leads to the models presented in Table 5 and Table 7 within the chapter text.

Test of robustness of results with and without the WTPP variable

Recognizing in the chapter text that modeling a binary dependent variable WTPP as continuous is not ideal although acceptable in this case, the significance and the direction of the model path coefficients is tested, with the independent binary variable WTPP dropped. This contributes to evaluate if modeling WTPP in such a way provides stable results or if instead its introduction or removal changes the interpretation of the other coefficients drastically.

Therefore, a model which is equal to the one presented in Table 1 but without the independent variable WTPP is run. Results show that the variable INFO has a negative effect (with a path coefficient equal to -0.45) and ATTEVOO has a positive effect on BELSEL (+0.25); the variables BELSEL (+0.62) and INFO (+0.31) both have a positive effect on BELFLAV; and the variables BELSEL (+0.31), BELFLAV (+0.41), MALE (+0.29) and ATTEVOO (+0.22) have a positive effect on ATT, while INFO has a negative effect (-0.31) on ATT. As direction and significance of the path coefficients towards BELSEL, BELFLAV and ATT is the same when adding the binary variable WTPP or not, it is concluded that keeping the WTPP in the final model in Table 1 provides very stable results. The same procedure is followed to analyze stability of results for hypotheses 2 and 3 with similar conclusions.

Computation of Total Causal Effects of INFO on WTPP

To interpret the magnitude of the effect of the variables INFO on WTPP in the path model testing hypothesis 1, the total causal effect is computed by summing the direct effect of INFO on WTPP and the total indirect effects linking INFO and WTPP, as commonly done in path analysis (Hair et al., 2006). The total indirect effects in each path are computed by multiplying each individual path coefficient from the variable INFO to the variable WTPP (see Table 12). The same procedure is used to compute the total causal effects in the path models testing hypotheses 2 and 3.

Table 12 - Computation of Total Causal Effects on INFO on WTPP

Path	Path Coefficient
INFO -> BELSEL -> BELFLAV -> ATT -> WTPP	-0.01
INFO -> BELSEL -> ATT -> WTPP	-0.01
INFO -> ATT -> WTPP	-0.02
INFO -> BELFLAV -> ATT -> WTPP	0.01
INFO -> BELSEL -> WTPP	-0.02
INFO -> BELSEL -> BELFLAV -> WTPP	-0.03
INFO -> BELFLAV -> WTPP	0.03
Total Indirect Effect of INFO -> WTPP	-0.05
Direct Effect of INFO -> WTPP	-0.10
Total Causal Effect of INFO -> WTPP	-0.15

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Chapter 3

POSITIVE BRAND INFORMATION MITIGATING NEGATIVE SHOCKS ON ANIMAL WELFARE

Animal welfare has recently become one of the most contentious issues in animal agriculture (American Veterinary Medical Association, 2006, Farm Foundation, 2006). While there appears to be no standardized definition of "animal welfare", ongoing public discussions and agricultural economics literature generically use this phrase to define the subject of how production practices impact the treatment of farm animals In the US, residents have recently expressed ethical concerns for animal welfare issues with successful ballot initiatives banning the use of gestation crates in swine production in three states (Videras, 2006). In the European Union (EU), the Commission signed a protocol in 2006 recognizing that animals are sentient beings and obliging the European Institutions to pay full regard to the welfare requirements of animals when formulating and implementing Community legislation (EU Commission, 2009), partly in response to pressure exerted by consumer activist groups. Public initiatives are accompanied also by private initiatives of major players within the meat supply chain. The European retailers' association GLOBALGAP, which by *de facto* controls the access of the majority of food imports in Europe (Reardon et al., 2010), has set animal welfare species-specific

standards at the production and processing level. Global fast food chains such as McDonald's and Burger King are sourcing an expanding share of their food from crate free sources (Martin, 2007). As new legislation and private standards on animal welfare bring additional costs for producers, such as the cost of switching to new practices and increasing the level of controls, which in turn increase the price paid by final consumers (Henson and Traill, 2000; Stott et al., 2005), understanding consumers perceptions and buying intentions for meat products with animal welfare attributes becomes of great importance for the industry.

A large recent strand of the literature has evidenced that a segment of consumers are willing to pay a premium for pork, chicken and beef with animal welfare attributes (Harper and Nilsson, 2006; Lagerkvist et al., 2006; Carlsson et al., 2007; Lijenstolpe, 2008; Tonsor et al., 2009a; Tonsor et al., 2009c). Results from this research strand are consistent with qualitative studies on consumers' attitudes and perceptions for "animal welfare" products (Harper and Makatouni, 2002; Schröder and McEachern, 2004). Consumers' preferences for animal welfare do not seem to vary significantly depending on demographic variables (Nilsson et al., 2006; Carlsson et al., 2007; Tonsor et al., 2009c), although they may vary according to their altruism and tendency of free riding (Lusk et al., 2007).

Although literature on animal welfare is rapidly expanding, a knowledge gap that remains unexplored is how consumers change their perceptions and preferences for meat products when receiving information on animal raising, handling and processing practices. Only Tonsor et al. (2009b) appear to have so far explored the impact of media coverage with animal welfare information on consumer preferences for meat products.

study were collected from 460 US residents through an experiment on fast food chicken breast sandwiches and then analyzed with a set of Latent Growth Models (LGM).

The remainder of this paper is organized as follows. In the next section, the literature on negative information shocks, the role of positive brand information and the theory of attitude formation are reviewed. Hypotheses are developed in the following section, while in section four the research methods and the model are presented. After illustrating the results in section five, conclusions are provided in the last section.

Literature Review

Negative information shocks can be defined as strong evidence from a well defined source that suddenly makes an attribute salient to consumers (Dawar and Pillutla, 2000; Klein and Dawar, 2004; Roehm and Tybout, 2006). In the field of agricultural economics, researchers have analyzed the impact of negative information shocks on consumer demand for food and agricultural products (Brown, 1969; Dahlgran and Fairchild, 1987; Smith et al., 1988; Robenstein and Thurman, 1996; Piggott and Marsh, 2004; Kalaitzandonakes et al., 2004). These studies have analyzed the impact of information shocks on food safety and healthiness, but not on animal welfare issues. In marketing, researchers have found negative information shocks can create negative brand associations (Klein and Dawar, 2004), affect consumers' attitudes toward the brand, and ultimately harm brand equity (Dawar and Pillutla, 2000).

Negative shocks can stem from media information of bad outcomes of the consumption of a brand's product, in the case of product-harm crises (Klein and Dawar,

2004) such as food-borne disease outbreaks. Negative shocks can also be brought about by negative publicity of non-governmental organizations (NGOs) advocating against an industry or company practices, such as unethical treatment of workers (Elliott and Freeman, 2003). However, negative information can also come from word-of-mouth (Scott and Tybout, 1981; Tybout et al., 1981; Smith and Vogt, 1995) and rumors, when the source of information transmitted through the word-of-mouth is not well defined (Kamins et al., 1997). There is evidence that word-of-mouth has a stronger negative effect on consumers' evaluation of an object than rumors (Smith and Vogt, 1995).

The magnitude of the effect of negative information shocks on consumers' brand evaluations depends on various factors. First of all, it depends on the content of the information shock, which means whether the negative information is a product-harm crisis (Klein and Dawar, 2004) or a scandal (Roehm and Tybout, 2006). In the case of product-harm crises, such as the consumer outrage at contaminated Coca-Cola cans in Belgium and France in 1999 (The Economist, 1999), consumers may perceive a threat for themselves that they were unaware of (Klein and Dawar, 2004), experience fear and develop responses to cope with it (Rogers, 1975; Floyd et al., 1990; Tanner et al., 1991). In the case of scandals revealing that a firm harms other entities, such as other people (Elliott and Freeman, 2003), animals, or the environment, consumers may perceive compassion or solidarity (Batson, 1998), as well as egregiousness towards the harming firm (Klein et al., 2003; Klein et al., 2004), which may lead to brand boycotting (Klein et al., 2004). However, consumers may also create inferences between scandals and product-harm crises. In the case of animal welfare, researchers have found consumers associate scandals about firms mistreating animals with food safety concerns and

2004) such as food-borne disease outbreaks. Negative shocks can also be brought about by negative publicity of non-governmental organizations (NGOs) advocating against an industry or company practices, such as unethical treatment of workers (Elliott and Freeman, 2003). However, negative information can also come from word-of-mouth (Scott and Tybout, 1981; Tybout et al., 1981; Smith and Vogt, 1995) and rumors, when the source of information transmitted through the word-of-mouth is not well defined (Kamins et al., 1997). There is evidence that word-of-mouth has a stronger negative effect on consumers' evaluation of an object than rumors (Smith and Vogt, 1995).

The magnitude of the effect of negative information shocks on consumers' brand evaluations depends on various factors. First of all, it depends on the content of the information shock, which means whether the negative information is a product-harm crisis (Klein and Dawar, 2004) or a scandal (Roehm and Tybout, 2006). In the case of product-harm crises, such as the consumer outrage at contaminated Coca-Cola cans in Belgium and France in 1999 (The Economist, 1999), consumers may perceive a threat for themselves that they were unaware of (Klein and Dawar, 2004), experience fear and develop responses to cope with it (Rogers, 1975; Floyd et al., 1990; Tanner et al., 1991). In the case of scandals revealing that a firm harms other entities, such as other people (Elliott and Freeman, 2003), animals, or the environment, consumers may perceive compassion or solidarity (Batson, 1998), as well as egregiousness towards the harming firm (Klein et al., 2003; Klein et al., 2004), which may lead to brand boycotting (Klein et al., 2004). However, consumers may also create inferences between scandals and product-harm crises. In the case of animal welfare, researchers have found consumers associate scandals about firms mistreating animals with food safety concerns and

specifically to product-harm crises (Verbeke and Viaene, 2000; Harper and Makatouni, 2002).

A second key factor driving the magnitude of the effect of negative information shocks on consumers' brand attitudes is the initial equity of the targeted brand (Ahluwalia et al., 2000; Dawar and Pillutla, 2000; Pullig et al., 2006). In particular, when consumers have a strong positive attitude towards the targeted brand (Petty and Krosnick, 1995) or commitment for it (Ahluwalia et al., 2000), negative information shocks have a weaker effect. Moreover, differentiation of a brand from competitors can limit the negative spillover from information shocks targeting a competing brand (Roehm and Tybout, 2006). For example, the presence of strong consumers' beliefs that a brand owner follows corporate social responsibility (CSR) principles is likely to mitigate the effect of negative information shocks about that brand, when the negative information is unrelated to the CSR principles.

A third important factor that explains variation in the effect of negative information shocks on a brand is the target of the information shock. That is if the information shock targets the brand directly, one of its competing brands within the same industry, or instead the whole industry, without any specification about individual brands (Roehm and Tybout, 2006). In some circumstances, the negative information shocks targeting a competing brand (Brand B) may have a negative effect on Brand A. In this case, an information shock on Brand B has a "negative spillover" on Brand A (Roehm and Tybout, 2006), whereas "spillover" is commonly defined as any phenomenon in which information influences beliefs that are not directly addressed in a communication (Ahluwalia et al., 2000; Balachander and Ghose, 2003).

Relative to this literature on negative information shocks, this research provides contributions in the following three areas. First, an analysis is presented on how the impact of negative information shocks on consumers' attitudes varies in the context of a scandal on animal welfare practices. Second, an analysis is done on how the impact of such a negative information shock varies when positive information is given beforehand. Third, an analysis is provided on how the effect of the negative information shock on consumers' attitudes varies according to whether the ex ante positive information is distracting or is directly relevant to animal welfare issues.

Positive Brand Information

Positive information about the brand can stem from the firm owning the brand, through advertising (Weinberger et al., 1981), or from external sources that are tied to the firm, such as sponsors or CSR partners (Klein and Dawar, 2004). Positive brand information usually has the effect of creating or strengthening positive brand associations (Keller, 1993) but it has also the role of moderating the effect of negative information shocks about the same brand (Weinberger et al., 1981; Okada and Reibstein, 1998). In the agricultural economics literature, many studies on the interaction between negative and positive information has been applied to the case of genetically-modified food products (Fox et al., 2002; Rousu et al., 2002; Lusk et al., 2004; Wachenheim and VanWechel, 2004; Nayga et al., 2005). Positive information usually has an impact weaker than negative information shocks (Smith and Vogt, 1995; Fox et al., 2002), as it is recognized to attract less attention than negative information shocks (Scott and Tybout, 1981; Tybout et al, 1981).

When it is used to moderate the effect of negative information shocks on consumers' brand attitudes, positive brand information has a different outcome according to two major dimensions: the order in which the positive information is received (Smith, 1993; Smith and Vogt, 1995) and the distance in the content of positive and negative information, that is, whether the two pieces of information strictly contradict each other or are about different brand attributes (Tybout et al., 1981; Okada and Reibstein, 1998; Klein and Dawar, 2004). When provided *ex ante*, positive information generally mitigates the negative effect of word-of-mouth (Smith and Vogt, 1995) and negative product trial (Smith, 1993), even if the positive and the subsequent negative information contradict each other. When the positive information is provided *ex post* and denies a negative information shock or a rumor, it might be ineffective in moderating the negative brand association or even strengthening it (Tybout et al., 1981; Okada and Reibstein, 1998). When creating positive associations that are distant from the negative associations, *ex post* positive information moderates the effect of negative information shocks (Tybout er al., 1981; Klein and Dawar, 2004).

A third factor explaining variability of the positive information in mitigating negative shocks to competing brands is the initial brand differentiation (Roehm and Tybout, 2006), which means having strength and uniqueness of brand associations (Keller, 1993). When Brand A is not clearly differentiated from the brand targeted by the negative shock (Brand B) and the positive information on Brand A is an *ex post* denial message - such as "the bad thing happened to Brand B has not happened to our Brand A" – then the positive information can reduce or eliminate the negative spillover effect (Roehm and Tybout, 2006). However, in the same circumstance, when Brand A is clearly

differentiated from Brand B, positive information on Brand A that denies what happened to Brand B can create a negative spillover that would not otherwise exist and ultimately damage Brand A (Roehm and Tybout, 2006).

Relative to this literature on the role of positive brand information mitigating negative information shocks, this research provides a contribution in the following two areas. First, an analysis is provided on how the mitigating role of positive information varies in the context of a scandal on animal welfare practices. Second, an analysis is presented on how the effect of positive information on consumers' beliefs, attitudes and buying intentions varies according to whether its content is distracting from the subject of the scandal or directly relevant to it.

In the attempt to bring such a contribution to the animal welfare debate and to the literature on negative and positive information, this study proposes and tests a theoretical framework that builds upon the theory of attitude formation (Fishbein, 1967; Fishbein and Ajzen, 1975).

Consumers' Brand Beliefs, Attitudes and Buying Intentions

Consumers' cognitive process to create their attitudes towards brands and ultimately to establish their buying behavior usually starts from evaluating brand attributes (Fishbein, 1967). By processing information about the attributes of a brand, consumers establish both evaluations and belief strengths for each attribute, such that the combination of the two determines their attitudes towards the brand (Fishbein, 1967). Brand attributes are a category of brand associations, which in turn are a key dimension of brand equity: when a brand has strong, favorable and unique associations, then it is clearly differentiated from other brands (Aaker, 1991; Keller, 1993). Brand attributes may be observed before

consumption (search attributes) or only after consumption (experience attributes, Nelson, 1970), but some of them may not be visible either before or after consumption (credence attributes, Darby and Karni, 1973). In the case of credence attributes, consumers' belief strengths play a crucial role in establishing their attitudes towards products, and brand information has a crucial importance in determining consumers' beliefs.

However, consumers' attitudes towards a brand do not always predict buying behavior (Fishbein and Ajzen, 1975). On the other hand, consumers' attitudes towards buying the brand, moderated by their subjective norms, predict buying intentions much more accurately (Fishbein and Ajzen, 1975; Sheppard et al., 1988). In turn, buying intentions predict behavior "unless intent changes prior to performance" or "unless the intention measure does not correspond to the behavioral criterion in terms of action, target, context, time-frame and/or specificity". The intention of buying a brand has various measurable dimensions. The most general one is the willingness to do an effort to perform to the buying action (Fishbein and Ajzen, 1975; Eagly and Chaiken, 1993), whereas the nature of the effort may vary according to the context: it may be the willingness to pay to obtain a product from that brand, the likelihood to pay a premium for that brand, or the likelihood to buy the product even if it is not sold in a favorite purchasing location. A second key dimension of buying intentions is the choice of the brand among alternatives (Fishbein, 1980; Fishbein and Ajzen, 1980), which is the process of comparing and selecting among the intentions associated with each alternative in the choice set.

This study borrows from these theories predicting the formation of attitudes and buying intentions to use the concepts of consumers' beliefs in the presence of an attribute associated to the brand (Fishbein, 1967) and attitudes towards a brand (Fishbein, 1967).

Hypotheses Development

The conceptual framework of this study is built upon the theory of attitude formation (Fishbein, 1967; Fishbein and Ajzen, 1975) and the theories of the interaction between positive and negative information shocks developed in consumer economics (Fox et al., 2002; Rousu et al., 2002; Lusk et al. 2004; Wachenheim and Van Wechel, 2004; Nayga et al., 2005) and consumer psychology (Tybout et al., 1981; Smith, 1993; Smith and Vogt, 1995; Okada and Reibstein, 1998; Klein and Dawar, 2004; Roehm and Tybout, 2006).

When analyzing the interaction between the negative shocks and the positive brand information, two assumptions are made based on the extent literature. First, negative information has a stronger marginal impact than positive information, no matter the information sequence nor the content of positive information, as already found by Smith and Vogt (1995), Fox et al. (2002) and Lusk et al. (2004). Second, ex ante positive information has a larger effect on mitigating the effect of the negative shock than ex post positive brand information, as already tested in extant literature (Smith, 1993; Smith and Vogt, 1995; Klein and Dawar, 2004). This assumption is also consistent with the theory explaining the impact of prior beliefs and the order of information on consumers' evaluations of objects (Russo et al., 1998; Carlson and Pearo, 2004; Carlson et al., 2006).

Building upon these assumptions, two major hypotheses are tested. First, ex ante brand information which is directly relevant to the content of the following negative shock is more effective in moderating the negative effect of the negative shock than brand information which aims at distracting from that content. Providing positive information on environment, social welfare and animal welfare attributes of a brand and of the brand owner may be considered the strategy of companies that are trying to minimize the future risk of being affected by future negative information shocks caused by advocating Non-Governmental Organizations (NGOs) or other civil society organizations. From this perspective, major food companies that joined multi-stakeholder dialogue initiatives such as the Sustainable Agriculture Initiative Platform (SAI, 2009), may be interested in developing positive brand information on sustainability issues even if their consumers value other attributes of their brands more. Therefore, it is hypothesized:

H1. Consumers receiving *ex ante* positive information relevant to animal welfare discount the following negative information shock on animal welfare more than consumers receiving *ex ante* distracting positive information.

This hypothesis juxtaposes with findings from previous literature suggesting that positive information is more effective when it "distracts" consumers from the negative shock, as it creates negative associations or rational suspiciousness (Tybout et al., 1981; Okada and Reibstein, 1998; Roehm and Tybout, 2006). If data provide evidence supporting this hypothesis, then providing ex ante positive information on issues that are relevant to future information shocks may be considered as a form of insurance for protecting the brand from scandals. Moreover, if the positive brand information has the

strength of differentiating the brand from competitors, then the brand may become immune to any negative information shocks affecting its industry, consistent with the finding of Roehm and Tybout (2006).

On the other hand, how should a company act when it has already been affected by a negative information shock? Should it react by developing brand information related to the content of the negative information, or should it choose to provide distracting positive information? Consistent with existing literature on product crises (Tybout et al., 1981; Okada and Reibstein, 1998), which highlights the risk that ex post information relevant to the negative shock just strengthen consumers' negative associations, it is hypothesized here that distracting positive information has a more positive effect on consumers' attitudes than relevant positive information. In other words:

H2. Consumers receiving *ex post* positive information distracting from animal welfare issues after a negative information shock have a stronger increase in attitudes than consumers receiving *ex post* information relevant to animal welfare.

After these two hypotheses are tested, further exploration will be made of which consumers' demographic and attitudinal characteristics significantly explain variation across the effects of positive brand information relevant to or distracting from animal welfare issues.

Methods

To test the hypotheses, data was collected from an on-line experiment focused on fast food boneless chicken sandwiches and animal welfare issues administered to 460 US-based residents in November 2009. Data was collected randomly from a representative sample recruited according to state, age, ethnic group and education level criteria by a professional survey company. Response rate to the experiment was around 20%, while on-line questionnaire completion rate was around 75%. Average length of the questionnaire was around 14 minutes.

A fast food brand was chosen as the object of our experiment because, similarly to other private actors within the meat industry, they have been recently targeted by negative information shock about their animal welfare practices by advocating NGOs (Hudson and Lusk, 2004; Martin, 2007). Although other negative information hit both fast foods and other actors competing in different industries, the case of animal welfare and fast foods was chosen because it is a relatively new issue, where respondents are less likely to have strong beliefs prior to the experiment. Therefore, we expect to find more variation after each information treatment on animal welfare than for after treatments on, say, environmental issues, labor issues or genetically-modified issues. On these latter issues, US respondents received a much heavier information load in the past five to ten years and so they are likely to have stronger prior beliefs (Fox et al., 2002; Rousu et al., 2002; Lusk et al. 2004). Furthermore, fast food restaurants have been already the object of previous studies on negative information regarding different attributes (Roehm and Tybout, 2006). Finally, chicken boneless sandwiches were chosen as the product of

interest because various fast food brands offer a similar product and because many ethical concerns were focused on the quality of life of chickens.

Research Design

After accepting the invitation to participate in this study, respondents were redirected to a web link with the questionnaire page. The experiment was divided in three major parts. First, participants answered questions on demographics, on their food value and their consumption habits related to chicken consumption. In the initial demographics section, along with a few preliminary questions about age, gender, ethnic group and nationality, respondents were asked how much they value origin, naturalness, sustainability and taste when purchasing and consuming food. Moreover, they were asked how often they consume chicken products. Every question has been measured with a seven-point Likert-scale item.

Second, respondents were divided into four groups, each receiving a different set of treatments. The four treatments consisted of positive information *distracting from* or *relevant to* animal welfare issues, as well as provided before a negative information shock (i.e. *ex ante*) or after the same shock (i.e. *ex post*) (see Figure 3). The positive brand information consisted of a set of reported declarations from differences sources: an advocating NGO (Greenpeace), a certifying NGO (Animal Welfare Society), a university expert on meat and animal welfare and a self-claim from McDonald's. The negative information treatment, published by the People for Ethical Treatment of Animals (PETA), denounced that McDonald's suppliers mistreat chicken and inflict them terrible pains while stocking, transporting and slaughtering them.

Figure 2 - The Four Treatments Interacting Positive and Negative Information

Group 1 Ex Ante Positive Information Distracting from Animal Welfare Issues	Group 3 Ex Ante Positive Information Relevant to Animal Welfare Issues
Group 2 Ex Post Positive Information Distracting from Animal Welfare Issues	Group 4 Ex Post Positive Information Relevant to Animal Welfare Issues

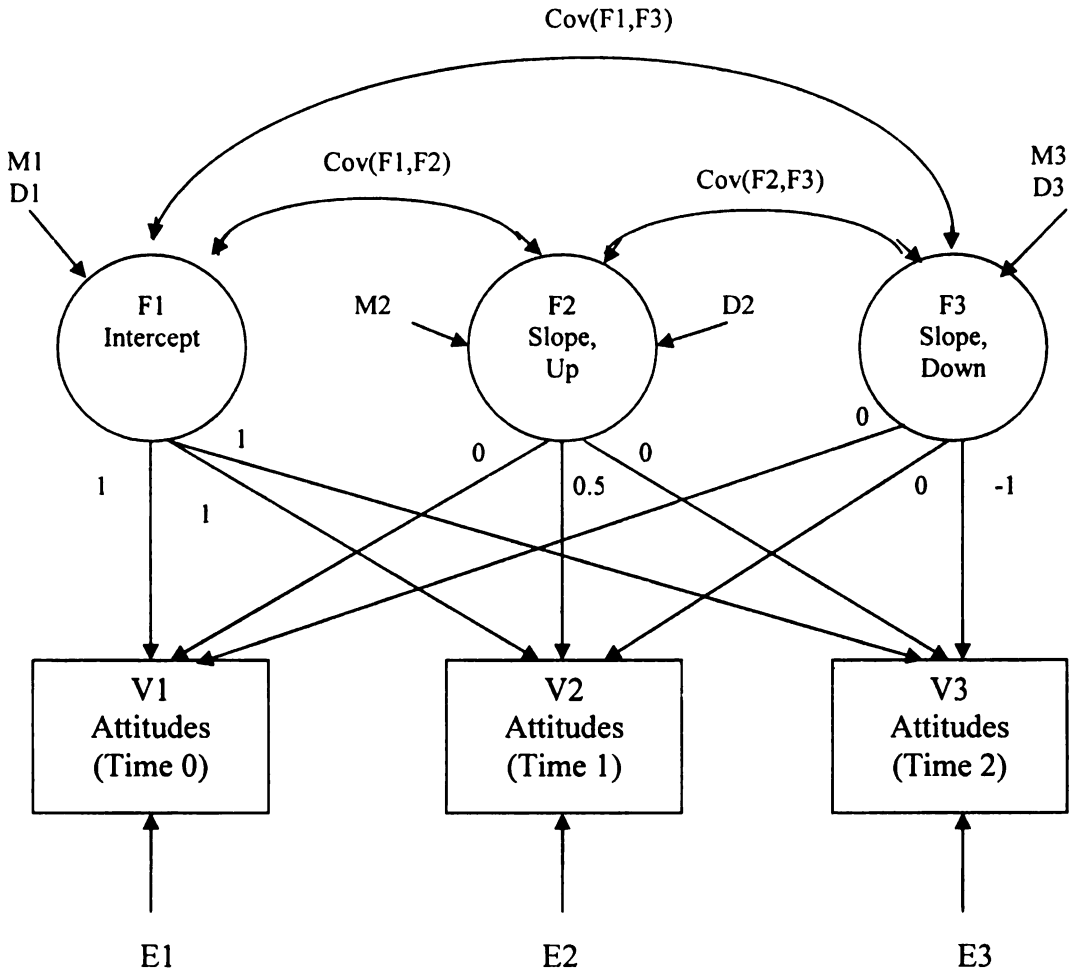
Third, after each treatment, participant responses were elicited on animal welfare beliefs, attitudes towards McDonald's chicken sandwiches and willingness-to-pay a premium price (WTPP). Respondents' belief strength in the association between animal welfare and the brands was measured with a seven-point Likert-scale, where the respondents are asked to strongly disagree/strongly agree with the following statement: "I believe that McDonald's takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products sold in their restaurants." Respondents' attitudes towards the brands were measured with one seven-point Likert-scale question asking "How would you describe your attitudes towards McDonald's?" where the scale was from very negative to very positive. WTPP has been elicited with two consecutive questions. First, respondents were simply asked

whether they were willing to pay a premium price or not for a McDonald's chicken sandwich, compared to a similar sandwich by a competing fast food brand. Participants responding "yes" were then asked which interval of price premium, expressed in percentage terms, were willing to pay. Therefore, we modeled WTPP as a continuous variable where the participants responding "no" had a zero value, while the participants responding "yes" had a value equal to the average value of the interval of price premium chosen. As the distribution of the variable WTPP was strongly skewed to the right, we added one point to each value and took the natural logarithm in order to make the WTPP distribution more normally distributed.

The Model

In order to capture the dynamic nature of the data we have collected, an analysis was through a set of latent growth models (LGMs) (Duncan et al, 1999). LGMs can be considered a specific category of structural equation models (SEMs) where the latent factors are the intercept and the slope of the growth of a variable across a group of individuals. Compared to longitudinal panel modes, LGMs have the advantage of both describing single individual's development trajectory of variables and capturing individual differences in these trajectories over time (Duncan et al, 1999). In particular, the latter characteristic allows the researcher to explore the factors moderating the intercept and slope of the development trajectory. Similarly to SEMs, limitations of LGMs include the assumption of multi-normally distributed variables and the necessity of large samples (Duncan et al, 1999).

Figure 3 - The Generic Piecewise Latent Growth Model



Legend: V1: Initial Consumers' Attitudes; V2: Consumers' Attitudes after receiving Positive Information; V3: Consumers' Attitudes after receiving Negative Information

As common in use in LGMs (Duncan et al., 1999), the loadings are fixed from factors to the measured variables at arbitrary values. In this study, the parameters were instead freed of the factors' means and variances, as well as the co-variances among factors. The factors' mean indicates the expected difference between the measurable variables at two different times, while the factors' variance indicates the inter-individual variability around the mean. Finally, the co-variance among factors indicates weather the initial levels of beliefs and attitudes are significantly associated with future changes or not.

In this study, to compare the impact of positive information distracting from and relevant to animal welfare issues, the LGM was built in four sequential steps: (1) with a simple piece-wise LGM, (2) with an associative LGM, (3) with a multi-group LGM and (4) with a predictive LGM. Data from the simple piece-wise LGM provide preliminary evidence that positive brand information has a positive impact on consumers' beliefs, attitudes and WTPP, no matter if it is distracting or relevant to animal welfare or given *ex ante* or *ex post*. Moreover, the variance of the latent growth and decrease factors is significantly large, which means that there is high inter-individual variation which justifies the use of LGM in this setting.

The generic simple piece-wise LGM applied to the case of ex ante positive information treatments has the following form, consistent with LGM literature (Duncan et al, 1999) (see Figure 4):

$$V_1 = l_{11}F_1 + l_{21}F_2 + l_{31}F_3 + e_1; \quad (1)$$

$$V_2 = l_{12}F_1 + l_{22}F_2 + l_{32}F_3 + e_2; \quad (2)$$

$$V_3 = l_{13}F_1 + l_{23}F_2 + l_{33}F_3 + e_3; \quad (3)$$

$$F_1 = a_1M_1 + b_1D_1; \quad (4)$$

$$F_2 = a_2M_2 + b_2D_2. \quad (5)$$

$$F_3 = a_3M_3 + b_3D_3. \quad (6)$$

In these expressions, V_1, V_2 and V_3 stand for the measured variables of interest (beliefs, attitudes and WTPP) at time 0, time 1 and time 2. F_1, F_2 and F_3 represent respectively the intercept, the growth factor caused by the positive information and the decrease factor caused by the negative information. Moreover, l_{ij} represent the loadings from the factors to the measured variables and e_i are the errors. Loadings and variable errors are fixed in order to make the model perfectly identified. Moreover, M_i are the inter-individual means of the intercept and the slope, while D_i are the inter-individual variances of the intercept of the slope to be estimated. Finally, $Cov(D_i,D_j)$ is estimated to understand if intercept and slope are significantly associated.

Results

The Impact of Distracting versus Relevant Ex Ante Positive Information

Results from the associative LGM with data from two groups of respondents reveal that consumers' beliefs on animal welfare, attitudes and willingness to pay a price premium increase significantly at 95% level both when consumers receive distracting and relevant positive information before the negative information (see Table 13).

Table 13 - Multi-Group Associative LGM: Distracting versus Relevant Ex Ante Positive Information

	Distracting Info		*Relevant Info*		Equality LM Test (Chi-Square)	
	Mean	**Var.**	**Mean**	**Var.**	**Mean**	**Var.**
AWBelief0	3.41 *	1.894 *	3.76 *	2.515 *	3.98 **	0.98
Attitude0	4.06 *	2.679 *	4.53 *	2.427 *	4.26 **	0.55
WTPP0	2.8% *	0.007 *	2.0% *	0.003 *	0.56	28.10 **
AWBelief1	3.92 *	4.868 *	4.79 *	7.892 *	14.59 **	4.40 **
Attitude1	4.46 *	2.435 *	4.93 *	4.765 *	0.19	14.36 **
WTPP1	4.6% *	0.019 *	3.6% *	0.015 *	0.06	0.74
AWBelief2	2.91 *	2.357 *	3.29 *	2.953 *	0.01	1.43
Attitude2	3.36 *	2.070 *	3.63 *	2.901 *	0.93	3.12 **
WTPP2	2.4%	0.005 *	1.8%	0.003 *	0.19	9.93 **
Overall Fit Indexes:						
Chi-Square	805.25 with 45 d.f.		745.97 with 45 d.f.		1551.23 with 90 d.f.	
CFI					0.920	
RMSEA					0.148	

Note: *95% probability that the parameter is significantly different from zero; **90% probability of significant drop of chi-Square when the equality constraint is removed.

When consumers receive positive information distracting from animal welfare issues at McDonald's, their animal welfare beliefs increase on average from 3.41 points to 3.92 and then decrease to 2.91 points when negative information on animal welfare is provided. This may seem odd, as the provided information aimed at distracting consumers from animal welfare issues, but it is likely that positive information about healthiness of McDonald's products has been used as a cue to increase beliefs on animal welfare. Also, their attitude towards the McDonald's product increase on average from 4.06 to 4.46 points and then decrease to 3.36 points, while their willingness to pay a premium for it increases from 2.8% to 4.6% and then decreases to 2.4%. Similarly, when

consumers receive relevant positive information on animal welfare practices at McDonald's, their beliefs increase on average from 3.76 points to 4.79 and then decrease to 3.29 points when negative information on animal welfare is provided. Also, their attitude towards the product increase on average from 4.53 to 4.93 points and then decrease to 3.63 points, while their willingness to pay a premium increases from 2.0% to 3.6% and then decreases to 1.8%. However, the analysis reveals that the decrease of consumers' willingness to pay a premium that received the negative information is not significant at 95% level, either when they ex ante received distracting or relevant positive information. This is probably driven by high censoring of WTPP at 0%, which takes place around 85% of respondents.

The significance at 95% level of the variance of all the variables indicates that there are significant inter-individual variation around the average increase and decrease of consumers' perceptions and buying intentions which could be explained by adding predictors to the model. The two associative models with distracting and relevant positive information have both a good overall fit with the data, as their chi-square is respectively 805.25 and 745.97 with 45 degrees of freedom (d.f.).

Although the overall trend of increase and decrease is similar, results from the multi-group LGM provide evidence that there are significant differences between the impacts of distracting versus relevant ex ante positive information (see Table 1).

First of all, the overall fit of the restricted multi-group model with the data is bad (chi-square is 1551.23 with 90 d.f., CFI=0.920 and RMSEA=0.148), indicating that the two models with distracting and relevant positive information cannot be constrained to be equal. Specifically, when consumers receive relevant positive information, their animal

welfare beliefs are significantly higher than when they receive distracting positive information, as the Lagrange Multiplier (LM) test indicates that the overall fit of the model would increase significantly (with a drop equal to 14.59 chi-square points) if this equality constraint is removed. Moreover, the initial attitudes and animal welfare beliefs are significantly higher for the group receiving the relevant positive information. We claim that this difference across group is casual rather than due to demographic differences across the two groups, as the differences across average age, income, education, gender and state of residency are not significant. However, from descriptive statistics, we found that the group receiving the relevant positive information had both higher initial attitudes for sustainability, naturalness and taste related to the other group, but obviously this was not possible to be controlled with the sample selection.

Important differences in the impact of distracting and relevant positive information are not only related to the means of the intercept, the increase and the decrease factors, but also to their variances. The LM test provides evidence that when consumers receive relevant positive information, the variance of the increase and decrease factors in attitudes is significantly larger than when they receive distracting information. Moreover, the variance of the increase in their animal welfare beliefs is higher and the variance of the decrease in their willingness to pay a premium is smaller. Overall, these differences in variance show that relevant positive information on animal welfare causes a larger variation of responses compared to distracting positive information. This further justifies the search for variables explaining the change in perceptions caused by relevant positive information on animal welfare practices.

On the other hand, as the LM test does not show that overall fit would improve significantly when the equality constraints of the increase and decrease factors' means were released, results from the multi-group LGM do not provide evidence that relevant positive information has a stronger mitigating effect on the following negative information shock than distracting positive information. Therefore, these results provide no evidence supporting hypothesis H1.

The Impact of Distracting versus Relevant Ex Post Positive Information

Similarly to the results with data from the first two groups of respondents, results of the associative LGM with data from the other two groups of respondents reveal that consumers' beliefs on animal welfare and attitudes increase significantly at 95% level both when they receive distracting and relevant positive information, even when positive information follows negative information (see Table 14).

When consumers receive positive information distracting from animal welfare issues at McDonald's after the negative information shocks, their animal welfare beliefs increase from 3.18 to 3.56 points but are still lower than their initial beliefs before receiving the negative information shock (3.91 points). Similarly, their attitudes towards the McDonald's product and their willingness to pay a price premium increase, but they are still lower than their initial attitudes and WTPP before receiving the negative information shock. However, the analysis reveals that the increase of consumers' WTPP receiving the positive information is not significant at 5% level, either when this is distracting or relevant to animal welfare issues. When instead consumers receive ex post relevant positive information on animal welfare practices at McDonald's, their beliefs

Table 14 - Multi-Group Associative LGM: Distracting versus Relevant Ex Post Positive Information

	Distracting Positive Info		Relevant Positive Info		Equality LM Test (Chi-Square)	
	Mean	**Var.**	**Mean**	**Var.**	**Mean**	**Var.**
AWBelief0	3.91 *	2.484 *	3.53 *	2.216 *	2.95	0.27
Attitude0	4.44 *	2.144 *	4.64 *	2.267 *	0.84	0.88
WTPP0	2.5% *	0.006 *	2.8% *	0.008 *	0.06	1.77
AWBelief1	3.18 *	2.199 *	2.94 *	2.225*	0.44	0.00
Attitude1	3.47 *	2.640 *	3.85 *	2.412 *	2.57	1.49
WTPP1	2.1 %	0.002 *	1.5% *	0.005 *	4.60 **	5.30 **
AWBelief2	3.56 *	6.399 *	3.66 *	9.765 *	6.18 **	5.46 **
Attitude2	4.20 *	6.077 *	4.30 *	8.319 *	0.19	1.18
WTPP2	2.2%	0.008 *	2.2%	0.022 *	0.05	5.02 **
Overall Fit Indexes:						
Chi-Square	735.56 with 45 d.f.		661.90 with 45 d.f.		1715.96 with 90 d.f.	
CFI					1.000	
RMSEA					0.000	

Note: *95% probability that the parameter is significantly different from zero. **90% probability of significant drop of chi-Square when the equality constraint is removed.

increase from 2.94 to 3.66 points, which is higher than their initial beliefs before receiving the negative information shock (3.53 points). On the other hand, consumers' attitudes towards the McDonald's product and their willingness to pay a price premium for it increase, but they are still lower than their initial attitudes and WTPP before receiving the negative information shock.

Again, the significance at 95% level of the variance of all the variables indicates that there are significant inter-individual variation around the average increase and decrease of consumers' perceptions and buying intentions. The two models have both a

good overall fit with the data, as their chi-square is respectively 735.56 and 661.90 with 45 d.f..

The similarity in the increase and decrease trends across the two groups receiving distracting and relevant positive information after a negative information shock is confirmed by the results from the multi-group LGM (see Table 14).

First of all, the overall fit of the restricted multi-group model with the data is excellent (as CFI=1.000 and RMSEA=0), indicating that the two models with distracting and relevant positive information can be effectively constrained to be equal. However, the LM test suggests removing a few equality constraints across the two groups. First, the average increase in consumers' animal welfare beliefs is significantly higher for consumers receiving relevant information than for those receiving distracting information, as removing the equality constraint would lead to a drop of 6.18 chi-square points. In particular, after receiving both the negative and the relevant positive information on animal welfare, consumers have higher beliefs that the McDonald's product has the animal welfare attribute than initially, while this does not happen in the case of consumers receiving distracting positive information. Moreover, the decrease of willingness to pay when negative information is provided is significantly higher in one of the two groups, although no difference in treatments was given beforehand.

Along with differences in means, the two models with ex post distracting and relevant positive information present a few differences also in variances. Specifically, the variance of the WTPP decrease factor and the variance of the beliefs and WTPP increase factors is significantly higher in the group receiving the ex post relevant positive information. These differences in variance confirm that relevant positive information on

animal welfare causes a larger variation of responses compared to distracting positive information, which further justifies the search for variables explaining the change in perceptions caused by relevant positive information on animal welfare practices.

However, as LM test do not show that overall fit would improve significantly when the equality constraints of the increase and decrease factors' means were released, results from the multi-group LGM do not provide evidence that distracting positive information has a more positive effect on consumers' attitudes than relevant positive information when provided after the negative information. Therefore, our results provide no evidence supporting hypothesis H2.

Predictors of the Impact of Distracting versus Relevant Positive Information

Results from the predictive LGM provide evidence that variables at individual level have a different effect on the intercept, growth and decrease factors according to whether the positive information provided is distracting from or relevant to animal welfare issues.

First, when positive information about McDonald's is given ex ante and it is distracting from animal welfare issues, age, gender and income play a practically significant role, i.e. each of these variables help improving the overall fit of the model, although they are not always statistically significant at 95% level. In particular, consumers with higher income tend to be significantly more sensitive to positive distracting information at 95% level and to discount negative information on animal welfare, while males tend to discount positive distracting information, which is relative to the healthiness of McDonald's products. The overall fit of this predictive LGM with the data is good, as CFI is 0.989 and RMSEA is 0.097 (see Table 15).

Table 15 - Predictive LGM: Distracting versus Relevant Ex Ante Positive Information on Consumer Attitudes

Distracting Info	**Indep. Var.**	**Coeff.**	**Std. Err.**	***Relevant Info***	**Indep. Var.**	**Coeff.**	**Std. Err.**
Intercept (F1)	*Mean*	4.23 *	0.60	**Intercept (F4)**	*Mean*	5.85 *	0.45
	Male	0.32	0.35		Education	-0.26 *	0.09
	Age	0.06	0.12		Age	-0.01	0.09
	Income	-0.13	0.09		Ev.Sustainable	-0.15	0.08
					Ev. Taste	0.28	0.14
Growth (F2)	*Mean*	0.20	0.49	**Growth (F5)**	*Mean*	0.62	0.64
	Male	-0.74 *	0.29		Education	0.01	0.13
	Age	0.05	0.10		Age	0.34 *	0.12
	Income	0.20 *	0.07		Ev.Sustainable	0.06	0.11
					Ev. Taste	-0.07	0.20
Decrease (F3)	*Mean*	1.44 *	0.49	**Decrease (F6)**	*Mean*	2.73 *	0.57
	Male	-0.31	0.29		Education	0.21 *	0.09
	Age	0.05	0.10		Age	-0.22 *	0.09
	Income	-0.19 *	0.07		Ev.Sustainable	0.19 *	0.08
					Ev. Taste	0.36 *	0.15
Covariance Matrix:				***Covariance Matrix:***			
	F1	**F2**	**F3**		**F4**	**F5**	**F6**
F1	2.91 *			**F4**	2.19 *		
F2	-0.70 *	1.92 *		**F5**	-0.71 *	4.45 *	
F3	0.93 *	-0.31	1.91 *	**F6**	1.00 *	-0.48 *	2.38*
Overall Fit Indexes:				***Overall Fit Indexes:***			
Chi-Square	235.80 with 18 degrees of freedom			**Chi-Square**	184.96 with 24 degrees of freedom		
CFI	0.989			**CFI**	1.000		
RMSEA	0.097			**RMSEA**	0.000		

Note: In the Predictive LGM, n=93 because there are 22 cases with missing income data that were excluded from the analysis.

When positive information about McDonald's is given ex ante and it is relevant to animal welfare issues, education and age are associated with changes in consumers' attitudes. Moreover, consumers' evaluation of sustainability and taste attributes in food had a practical impact on consumers' attitudes. Specifically, consumers with higher education have lower initial attitudes towards McDonald's chicken sandwich and are more sensitive

to negative information on animal welfare issues. On the other hand, elder consumers tend to be significantly more sensitive to positive relevant information while they tend to discount negative information. Finally, consumers who value sustainability and taste attributes in food consumption tend to be more sensitive to negative information on animal welfare. The overall fit of this predictive LGM with the data is good, as CFI is 1.000 and RMSEA is 0.000.

Moreover, when consumers receive information relevant to animal welfare is given, the stronger their growth in attitudes with ex ante positive information, the smoother their decrease in attitudes following the negative information shock (as the covariance between F5 and F6 is -0.48 and significant at the 95% level), as the correlation matrix in Table 3 shows. The same negative association is not significant in the case of consumers receiving distracting positive information. Finally, consumers with higher initial attitudes tend to discount both negative and positive information, no matter whether it is distracting or relevant to animal welfare.

When instead positive information about McDonald's is given ex post and it is distracting from animal welfare issues, income and frequency of consumption significantly explain positive and negative changes in consumers' attitudes (see Table 16). In particular, consumers with higher income tend to discount negative information on animal welfare, while people consuming chicken more frequently tend to be more sensitive to negative information on animal welfare. This direct association between frequency of meat consumption and sensitiveness to negative information on animal welfare seems to contradict the recent research that found that frequent consumers of meat tend to discount information on animal welfare.

Table 16 - Predictive LGM: Distracting versus Relevant Ex Post Positive Information on Consumer Attitudes

Distracting Info	**Indep. Var.**	**Coeff.**	**Std. Err.**	***Relevant Info***	**Indep. Var.**	**Coeff.**	**Std. Err.**
Intercept (F1)	*Mean*	4.34 *	1.07	**Intercept (F4)**	*Mean*	5.22	0.43
	Income	-0.12	0.07		Education	-0.22*	0.10
	Freq. Cons.	0.19	0.17		Ev.Sustainable	0.02	0.08
	Ev.Sustainable	0.01	0.08				
	Ev. Taste	-0.08	0.09				
Decrease (F2)	*Mean*	0.08	1.12	**Decrease (F5)**	*Mean*	0.94	0.45
	Income	-0.20*	0.07		Education	-0.19	0.10
	Freq. Cons.	0.36 *	0.17		Ev.Sustainable	0.11	0.08
	Ev.Sustainable	0.13	0.08				
	Ev. Taste	-0.09	0.09				
Growth (F3)	*Mean*	-0.13	0.11	**Growth (F6)**	*Mean*	-2.03	0.84
	Income	0.20	0.11		Education	0.42 *	0.19
	Freq. Cons.	-0.47	0.27		Ev.Sustainable	0.04	0.15
	Ev.Sustainable	0.19	0.13				
	Ev. Taste	0.08	0.14				
Covariance Matrix:				***Covariance Matrix:***			
	F1	**F2**	**F3**		**F4**	**F5**	**F6**
F1	2.06 *			F4	2.16 *		
F2	0.60 *	2.28 *		F5	0.78 *	2.30 *	
F3	-0.63	-1.83 *	5.24 *	F6	1.57 *	-2.76*	7.97 *
Overall Fit Indexes:				***Overall Fit Indexes:***			
Chi-Square	163.92 with 24 degrees of freedom			**Chi-Square**	144.26 with 13 degrees of freedom		
CFI	0.916			**CFI**	1.000		
RMSEA	0.145			**RMSEA**	0.000		

Note: In the Predictive LGM, n=93 because there are 22 cases with missing income data that were excluded from the analysis.

A possible explanation of this association may be that frequent meat consumers in the US are strengthening their inferences across the animal welfare attributes and both food safety and taste, which are obviously salient attributes for frequent meat consumers. The overall fit of the model is acceptable, as RMSEA=0.145 and CFI=0.916.

When positive information about McDonald's is given ex post and it is relevant to animal welfare issues, consumers' education and evaluation of sustainability attributes

play a practically significant role in explaining the positive and negative changes in attitudes. Specifically, consumers with higher education have lower initial attitudes towards McDonald's products and they are more sensitive to positive information on animal welfare. The overall fit of the model is excellent, as RMSEA=0.000 and CFI=1.000.

Finally, correlation matrices in Table 4 suggests that the stronger the decrease in attitudes when negative information is given, the weaker the following effect of positive information, no matter if distracting or relevant to animal welfare issues. Moreover, the higher are the initial attitudes towards the McDonald's chicken sandwich, the stronger is the effect of ex ante negative information. At the same time, when positive information is relevant to animal welfare issues, initial attitudes are positively associated with the attitude growth, as the covariance between F4 and F6 shows. This effect is not present in the case of distracting positive information. This illustrates that relevant positive information on animal welfare can be more useful than distracting information to restore the initial attitudes of consumers that really like a branded product, once a negative shock occurred.

Conclusions

In the new era of global food systems, effective communication of food quality attributes to final consumers through brands is becoming a managerial task that goes far beyond meeting public and private standards imposed by governments and retailers.

This study provides implications for fast food company managers that are responsible for communicating the quality attributes of their brands to final consumers and that need to tailor brand information to specific consumer characteristics by indicating which content of positive brand information is more effective to protect a brand from information shocks on animal welfare and which consumers are more sensitive to different information content.

Tackling such a research question provides a contribution to the rapidly expanding animal welfare literature (Lagerkvist et al., 2006; Carlsson et al., 2007; Lijenstolpe, 2008; Tonsor et al., 2009a; Tonsor et al., 2009c), where only a few studies have so far analyzed how media coverage affects consumers' preferences for meat products (Tonsor et al., 2009b). Specifically, this appears to be the first study analyzing the interaction of positive and negative information about animal welfare on consumers' perceptions and intentions to buy a product. Outside the boundaries of the animal welfare literature, this study also attempts to integrate current knowledge on the impact of sequences of positive and negative information shocks on consumer behavior, developed across the fields of economics (Fox et al., 2002; Rousu et al., 2002; Lusk et al. 2004; Wachenheim and Van Wechel, 2004; Nayga et al., 2005) and psychology (Russo et al., 1998; Smith and Vogt, 1995; Roehm and Tybout, 2006), by analyzing inter-individual and inter-group differential effects with a Latent Growth Modeling (LGM) approach (Duncan et al., 1999).

Results show that the means of consumers' attitude growth and decrease do not differ significantly across different content of information, but the variance of consumers' attitude growth and decrease is significantly higher when information relevant to animal

welfare is provided. This highlights that different consumers have very different reactions when exposed to animal welfare information, consistent with the findings of Lusk et al. (2004), who found that consumers with stronger priors are less sensitive to genetically-modified information. Specifically, we found that age and education have a significant predictive power on the reaction to positive information relevant to animal welfare. On the other hand, we found that income and gender can explain a significant part of the growth variance when consumers receive positive information distracting from animal welfare issues.

Although results have useful managerial implications, the analysis of this study is limited to the context of fast food industry and to the case of animal welfare. Future research should seek for a generalization of these results across industries and across content of attribute information. For example, it would be interesting to test if the same conclusion could be drawn in the same industry when consumers are exposed to environmental friendly production or on labor conditions. Moreover, it would be interesting to test if, when exposed to the same animal welfare attribute negative and positive information, consumers' perceptions change across meat products, across individual brands or across different levels of the supply chain of the product. Finally, it would be useful to analyze how different contents and different sources of positive information act on mitigating the negative impact of information shocks. These hypotheses could be tested in future research by applying the multi-group LGM analysis introduced in this study and changing the set of information treatments.

Appendix E

SURVEY INSTRUMENT – CHAPTER 3

Thank you for participating to this research study. This study is conducted by the Department of Agricultural, Food and Resource Economics and the Department of Marketing at Michigan State University. Mr. Domenico Dentoni is the research coordinator and Prof. Christopher H. Peterson is the responsible principal investigator.

From this study, we hope to learn insights on how consumers perceive various attributes of meat products and process product information. You will be asked questions about both beef steak and chicken breast. Your participation to this research project is completely voluntary and we will preserve the confidentiality of your information. Your participation in this study will take no more than 20 minutes.

Feel free to ask the researchers any questions you may have at the following contacts:

- Mr. Domenico Dentoni, 409 Agricultural Hall, Michigan State University, 48825 East Lansing, Michigan. Email: dentonid@msu.edu. Phone: 517-488-9277.
- Prof. Christopher H. Peterson, 83 Agriculture Hall, Michigan State University, 48825, East Lansing, Michigan. Email: peters17@msu.edu. Phone: 517-355-1813.

Demographics

1. I am: ___ Male ___ Female
2. I am _____ years old (fill-in the blank or drop down).
3. The best description of my educational background is:
    a. Did not graduate from high school
    b. Graduated from high school, Did not attend college

c. Attended College, No Degree earned
d. Attended College, Associates or Trade Degree earned
e. Attended College, Bachelor's (B.S. or B.A.) Degree earned
f. Graduate or Advanced Degree (M.S., Ph.D., Law School)
g. Other (please explain): _____

4. There are ____ adults and ____ children living in my household (please fill-in the two blanks)

5. My ZIP code is: _____.

6. What best describes your race?

a. White, Caucasian
b. Black, African American
c. Asian, Pacific Islander
d. Mexican, Latino
e. American Indian
f. Other (please describe): _____

Food Attitudes and Values

7. How frequently do you consume the following meat products at any meal, either at home or away from home consumption:

	4 or more times per week	2-3 times per week	Once per week	2-3 times per month	Once per month or less	Never
Chicken						
Beef						

8. How much time have you spent residing outside the US during your entire life?

a. None, I've always lived in the US
b. Between 1 month and 6 months
c. Between 6 months and 1 year
d. Between 1 year and 2 years

e. Between 2 years and 5 years
f. Between 5 years and 10 years
g. Between 10 and 20 years

Please rate to what extent you agree or disagree with the following statements:

9. When I choose the food I eat, an important thing I consider is the country or region where it is produced. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

10. When I choose the food I eat, an important thing I consider is if it is natural (that is, if it is produced without modern technologies) (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

11. When I choose the food I eat, an important thing I consider is if it is "sustainable" (that is, if it is produced by a company that respects the social and environment conditions within the area of production). (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

12. When I choose the food I eat, an important thing I consider is its taste and appearance (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

Initial McDonald's Brand Equity

Please answer the following questions about McDonald's.

A McDonald's logo is placed here[1].

13. How would you describe your attitude towards McDonald's? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you agree or disagree with the following statement.

14. I believe that McDonald's takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

15. Do you believe that McDonald's takes MORE, EQUAL or LESS effective measures to provide proper animal welfare to chickens and hens raised,

transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants relative to its competitors?

a. More
b. Equal
c. Less
d. I don't know

Now please answer the following questions about Burger King.

A Burger King logo is placed here.

16. How would you describe your attitude towards Burger King? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you agree or disagree with the following statement.

17. I believe that Burger King takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

18. Do you believe that Burger King takes MORE, EQUAL or LESS effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants relative to its competitors?

a. More
b. Equal
c. Less
d. I don't know

19. If the price of a Boneless Chicken Sandwich were the same across the following brands, which brand would you choose?

a. McDonald's
b. Burger King
c. Kentucky Fried Chicken

d. Wendy's
e. Others
f. None

20. Would you be willing to pay a premium if it costs more to purchase a McDonald's Chicken Sandwich than another brand's Chicken Sandwich?

    a. Yes
    b. No

21. How much more are you willing to pay to get a McDonald's Chicken Sandwich rather than another brand of Chicken Sandwich?

    a. Between 0% and 10% more
    b. Between 10% and 20% more
    c. Between 20% and 40% more
    d. Between 40% and 60% more
    e. Between 60% and 80% more
    f. Between 80% and 100% more
    g. At least 100% more

Information Treatment 1

Please read this further piece of information about McDonald's.

Havin' fun!!!

McDonald's is one of life's many small pleasures that millions of people around the world enjoy every day. Great food. Fun to eat. Casual environment. Local and familiar. And always something new!

You want the very best for your kids, and so do we at McDonald's. That's why we've made quality a top priority:

a. McDonald's coffee is made with 100% pure Arabica coffee beans.
b. McDonald's burger patties are cooked straight on the grill with no added fat or oil.
c. McDonald's Premium Chicken Sandwiches are made with all white meat real chicken.
d. McDonald's premium salads contain no preservatives, and are assembled fresh in the restaurant daily.

e. McDonald's Happy Meal Milk jugs contain real 1% low fat white or chocolate milk.
f. McDonald's Apple Dippers are made with farm-fresh apples selected for their crispness, color and texture.

A picture with a group of McDonald's prodcuts is placed here.

Now please answer the following questions about McDonald's.

A McDonald's logo is placed here.

22. How would you describe your attitude towards McDonald's? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you agree or disagree with the following statement about McDonald's.

23. I believe that McDonald's takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

24. Do you believe that McDonald's takes MORE, EQUAL or LESS effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants relative to its competitors?

    a. More
    b. Equal
    c. Less
    d. I don't know

25. Would you be willing to pay a premium if it costs more to purchase a McDonald's Chicken Sandwich than another brand's Chicken Sandwich?

    a. Yes
    b. No

26. How much more are you willing to pay to get a McDonald's Chicken Sandwich rather than another brand of Chicken Sandwich?

    a. Between 0% and 10% more
    b. Between 10% and 20% more
    c. Between 20% and 40% more
    d. Between 40% and 60% more
    e. Between 60% and 80% more
    f. Between 80% and 100% more
    g. At least 100% more

Now please answer the following questions about Burger King.

A Burger King logo is placed here.

27. How would you describe your attitude towards Burger King? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you now agree or disagree with the following statement about Burger King.

28. I believe that Burger King takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

29. Do you believe that Burger King takes MORE, EQUAL or LESS effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants relative to its competitors?

    a. More
    b. Equal
    c. Less
    d. I don't know

30. If the price of a Boneless Chicken Sandwich were the same across the following brands, which brand would you choose?

a. McDonald's
b. Burger King
c. Kentucky Fried Chicken
d. Wendy's
e. Others
f. None

Information Treatment 2

Please read this further piece of information about production practices at McDonald's.

PETA's "McCruelty – I'm hatin' it" campaign message:

"McDonald's chicken suppliers in the United States kill birds with cruel methods. Chickens typically suffer broken limbs, they have their throats cut while they are still conscious and are often scalded to death in defeathering tanks.

It would cost McDonald's NOTHING to demand that its chicken suppliers switch to a far less cruel slaughter method. But McDonald's refuses.

Tell McDonald's to stop the cruelty."

A "McCruelty: I'm hatin it" logo by PETA is placed here.

Now please answer the following questions about McDonald's.

A McDonald's logo is placed here.

31. How would you describe your attitude towards McDonald's? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you now agree or disagree with the following statement about McDonald's.

32. I believe that McDonald's takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of

food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

33. Do you believe that McDonald's takes MORE, EQUAL or LESS effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants relative to its competitors?

    a. More
    b. Equal
    c. Less
    d. I don't know

34. Would you be willing to pay a premium if it costs more to purchase a McDonald's Chicken Sandwich than another brand's Chicken Sandwich?

    a. Yes
    b. No

35. How much more are you willing to pay to get a McDonald's Chicken Sandwich rather than another brand of Chicken Sandwich?

    a. Between 0% and 10% more
    b. Between 10% and 20% more
    c. Between 20% and 40% more
    d. Between 40% and 60% more
    e. Between 60% and 80% more
    f. Between 80% and 100% more
    g. At least 100% more

A Burger King logo is placed here.

36. How would you describe your attitude towards Burger King? (Seven-point scale, from 1. Very Negative to 7. Very Positive)

Please rate to what extent you now agree or disagree with the following statement about Burger King.

37. I believe that Burger King takes effective measures to provide proper animal welfare to chickens and hens raised, transported, and processed for production of food products (e.g., chicken nuggets and eggs) sold in their restaurants. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

38. If the price of a Boneless Chicken Sandwich were the same across the following brands, which brand would you choose?

    a. McDonald's
    b. Burger King
    c. Kentucky Fried Chicken
    d. Wendy's
    e. Others
    f. None

Please rate to what extent you agree or disagree with the following statement.

39. When I buy meat products, I like to receive detailed information about product quality. I am not particularly bothered by receiving too much information on the product. (Seven-point scale, from 1. Strongly Disagree to 7. Strongly Agree)

40. My annual pre-tax, household income is:

    a. Less than $ 20,000
    b. $ 20,000-$ 39,999
    ...
    j. 180,000 $ or more

41. When you buy a beef steak for your consumption, which one of this two products would you choose assuming that they have the same price:
    a. A USDA-certified beef steak which is produced with animal welfare, environment friendly practices, from grass-fed animals.
    b. A beef steak which is "simply a beef steak".
    c. None of the two.

Appendix F

OTHER TREATMENT – CHAPTER 3

In this appendix, I provide the information treatments that did not appear in the survey instrument for Group 1 but that were administered to either Group 2, 3 or 4. Each treatment was presented to respondents within the same page.

Positive Information Treatment Related to Animal Welfare

Please read these brief pieces of information about McDonald's production practices.

- John Sauven, Campaign Director of Greenpeace International, claims:

"McDonald's moved very swiftly to support the Amazon Rainforest campaign. It has played a key role in bringing the US-based multinational soybean traders to the negotiating table and this is a significant breakthrough. The soy which is fed to our pigs, chickens and cows to make meat products is one of the main drivers of deforestation."

A Greenpeace logo is placed here.

- Excerpt from "McDonalds' Guiding Principles on Animal Welfare":

"McDonald's commitment to animal welfare is global and guided by the following principles. These principles apply to all the countries in which McDonald's does business.

Quality: McDonald's believes treating animals with care and respect is an integral part of an overall quality assurance program that makes good business sense.

Animal Treatment: McDonald's supports that animals should be free from cruelty, abuse and neglect while embracing the proper treatment of animals and addressing animal welfare issues.

Partnership: McDonald's works continuously with our suppliers to audit animal welfare practices, ensuring compliance and continuous improvement."

A McDonald's logo is placed here.

- Temple Grandin, a recognized expert and leader in the field of animal welfare from Colorado State University, claims:

"I have been working for almost 25 years in designing facilities before I started doing work with McDonald's. When I worked with implementing the McDonald's' operations in 1999, it just made a huge, huge change. It was a massive tipping point where the whole culture of the meat industry changed to where animal welfare is important. I am very proud of that".

A picture of a livestock expert with cows in background is placed here.

Appendix G

METHODOLOGICAL NOTE – CHAPTER 3

This methodological note provides a detailed report of the analysis conducted in Chapter 3. Results obtained from the analysis described within the chapter are derived after undertaking the following intermediate steps:

- Simple Piecewise LGM
- Associative LGM
- Curve-of-Factors LGM
- Multi-group Associative LGM
- Predictive LGM with WTPP
- Predictive LGM with Attitudes

The entire analysis has been performed with the structural equation program EQS, copyright by P.M. Bentler, Multivariate Software, Inc., Version 6.1, 1985-2006 (B91).

Simple Piecewise LGM

Piecewise LGM represent a specific case of LGM that describes structural changes in observed measures over time (Duncan et al., 1999). Therefore, in this study piecewise LGM is used to describe structural changes in consumers' beliefs, attitudes and WTPP created by the sequence of positive and negative information treatments. When building the models, the difference between piecewise LGMs and general LGMs is only in the arbitrary choice of the values of the fixed parameters (i.e., loadings) linking the factors to the observed variables. In general LGMs, the values of these loading is linearly dependent for all factors, such as:

$$V1 = 1*F1 + 0*F2 + 0*F3 + e1; \quad (1)$$

$$V2 = 1*F1 + 1*F2 + 2*F3 + e2; \quad (2)$$

$$V3 = 1*F1 + 2*F2 + 4*F3 + e3; \quad (3)$$

$$F1 = a1M1 + b1D1; \quad (4)$$

$$F2 = a2M2 + b2D2; \quad (5)$$

$$F3 = a3M3 + b3D3; \quad (6)$$

where the loadings of the linear growth F2 are 0, 1, 2 and the loadings of the quadratic growth factor are 0, 2, 4 (Duncan et al., 1999). The interpretation of the parameters is the same as in the text of the chapter. In a piecewise model describing a structural change the fixed parameters of the loadings are not necessarily linearly dependent and can be of opposite directions among factors. For example, in the piecewise LGM described in Figure 2, the loadings of F2 are 0, 0.5, 0, while the loadings of F3 are 0, 0, -1. Then, in

this case F2 can be interpreted as an increase factor, while F3 as a decrease factor after the structural change (i.e., the negative information treatment) occurs.

A simple piecewise LGM model is first built for each measure individually. This provides information about the individual significance of coefficients describing growth and decrease after the shocks (Mi), as well as a measure of each factor variance (Di). Results of the piecewise LGM for attitudes of respondents included in Group 1 of the experiment are reported in Table 17.

Table 17 - Simple Piecewise LGM with Consumer Attitudes in Group 1

	Mean	**Std. Dev.**		**Mi**	**Di**
V1	4.07	1.64	**F1**	4.07*	0.36*
V2	4.46	1.56	**F2**	0.78*	0.39*
V3	3.36	1.68	**F3**	0.70*	3.56*
Chi-Square	0.000 with -3 d.f.				
CFI	0.987				

Legend: V1 to V3 indicate observed measures of attitudes from Time 0 to Time 2. F1 = Intercept Factor of Attitudes; F2 = Increase Factor of Attitudes; F3 = Decrease Factor of Attitudes.
Note: the asterisk (*) indicates significance at the 95% level.

Results provide evidence that the growth and decrease trends are significant when the information treatment is given and that variance is significantly large. The model is under-identified because the number of free parameters to be estimated is higher than the number of known parameters; therefore we add parameters in the following steps of building a LGM. A similar piecewise LGM model has been run for the measures of animal welfare beliefs and WTPP of respondents in Group 1 and for all respondents' measures in Groups 2, 3 and 4.

Associative LGM

The associative LGM is one large model that describes the change factors for several measures at the same time to analyze if there is covariance among the change across the measures (Duncan et al., 1999). An associative LGM is built where the increase and decrease factors load to measures of beliefs, attitudes and WTPP simultaneously, where the co-variances among each of the nine factors (three factors for each measure) are estimated. The factor loadings are the same as in the simple piecewise LGM for each of the three variables. The co-variance matrix from the associative LGM is reported in Table 18.

Table 18 - Co-variance Matrix of the Associative LGM with Consumer Attitudes in Group 1

	F1	F2	F3	F4	F5	F6	F7	F8	F9
F1	2.68*								
F2	1.36*	1.89*							
F3	0.02	0.00	0.01*						
F4	-0.86*	-0.03	0.03*	2.43*					
F5	0.79*	-0.71*	0.05*	0.26	4.87*				
F6	0.02	0.01	0.00	0.04*	0.08*	0.02*			
F7	0.97*	0.38*	0.00	-0.57*	0.21	0.00	2.07*		
F8	0.24	0.80*	-0.02	0.20	-1.21*	0.00	1.31*	2.36*	
F9	0.00	-0.01	0.00	0.02	0.00	-0.01	0.03*	0.02	0.01*

Legend: F1 = Intercept Factor of Attitudes; F2 = Intercept Factor of Beliefs; F3 = Intercept Factor of WTPP; F4 = Increase Factor of Attitudes; F5= Increase Factor of Beliefs; F6 = Increase Factor of WTPP; F7 = Decrease Factor of Attitudes; F8= Decrease Factor of Beliefs; F9 = Decrease Factor of WTPP.
Note: values on the diagonal are factor variances Di; the asterisk (*) indicates significance at the 95% level.

Results provide evidence that there is covariance among the increase and decrease factors across the three measures of beliefs, attitudes and WTPP. The associative LGM model has also been run with data of the measures from respondents in Groups 2, 3 and 4.

Multi-Group Associative LGM

The multi-group associative LGM is used to analyze if there are differences across the parameters from respondents' data in Group 1 and Group 3, which provide evidence also to test the stated hypotheses in Chapter 3. In particular, a control has been performed to establish if there are differences across factor means and factor variances across Group 1 and Group 3, where respondents in Group 1 received a positive information which is unrelated to animal welfare and respondents in Group 3 received a positive information related to animal welfare.

To control for these differences across parameters in the two groups, an equality constraint is imposed to the model. Therefore, the LM test is performed to explore which constraints have to be released in order to obtain a significant fit improvement. Results are presented in Table 13 in the Chapter.

The same procedure has been used to compare differences in parameters across Group 2 and Group 4. An interpretation of these results is provided in the text of the Chapter.

Curve-of-Factors LGM

The curve-of-factor LGM describes the change of several measures with only one set of factors to analyze if the same pace of change is the same across several measures or not

(Duncan et al., 1999). In this case, a curve-of-factors LGM is built to analyze if a unique set of factors can describe the change occurring across beliefs, attitudes and WTPP. When running the model with data from respondents in group 1, as the overall fit of the model with data is low (chi-square=248.68 with 30 d.f. and p-value<0.001; CFI=0.697; RMSEA= 0.285), results show that the changes in the three measures cannot be effectively described by only one set of factors and so that there are differences in the pace of change across beliefs, attitudes and WTPP. The same curve-of-factors LGM is also run with only two out of the three variables and repeated the same analysis with measures of respondents in Group 2, 3 and 4. In each evaluated case, the curve-of-factors LGM failed to provide an adequate fit.

Predictive LGM with WTPP

As the curve-of-factors LGM suggests that no unique change factor can effectively describe the change in beliefs, attitudes and WTPP simultaneously, an analysis of what are the predictors of the change factor for each measure independently has been done. First, a predictive LGM is run with the WTPP measures by adding all the expected predictive variables (i.e., demographics, chicken consumption habits, food values) to the simple piecewise WTPP model and estimating the impact of each of these variables on the intercept, increase and decrease factors.

The output indicates that parameters are linearly dependent, and so that the output of this model cannot be trusted. From the EQS 6.1 output, results indicate that linearly dependent parameters are the errors of the three WTPP measures over time (e1, e2 and e3 in the generic piecewise LGM). This is due to the fact that the majority of WTPP values

are zero (around 85%), as only few respondents are WTP a premium price for McDonald's chicken sandwiches, no matter their demographics and the information treatments they receive. Output is similar when the same predictive LGM with WTPP from respondents' data in Group 2, 3 and 4 is run. Therefore, data collected do not allow analyzing predictors of WTPP changes over time. The same predictive LGM is then repeated with respondents' attitudes.

Predictive LGM with Attitudes

Results of final predictive LGM are presented in Tables 15 and 16 in the Chapter. To build the final predictive LGM illustrated in these tables, a first preliminary predictive LGM is run with only demographic and chicken consumption habit predictors. A second preliminary predictive LGM with only food value predictors is also run. As overall goodness-to-fit with the data was bad, a Wald Test is performed to drop the independent variables that bring the least contribution in explaining the dependent variables and those that create serious problems of multi-collinearity. Therefore, in the predictive LGM with attitudes measures from respondents in Group 1, respondents' education (which has high co-variance with income), chicken consumption frequency and value for food sustainability and origin (as suggested by the Wald test) are dropped.

Therefore, a third predictive LGM is run with all the predictors but the variables dropped previously, and then evaluated the model looking again at the overall goodness-to-fit, the Wald test and the co-variance among independent variables. At this stage, the respondents' value for taste variable is also dropped, as suggested by the Wald test. Therefore, a fourth and final predictive LGM is built with the remaining variables, which

are respondents' gender, income and age, and obtained the results in Table 15 in the Chapter. The same procedure has been used to come up with the final predictive LGM with attitudes of respondents in group 2, 3 and 4.

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CONCLUSION

This research work represents an initial attempt to build a theory of branding products with credence attributes. This aims at analyzing which credence attribute information can differentiate a brand from its competitors and so make a firm gain a benefit advantage over its competitors.

This research attempts to provide both a conceptual and methodological contribution to the agri-food marketing literature. From a conceptual standpoint, this research integrates agricultural economics literature with a literature built upon the theory of attitude formation, developed in psychology and applied to marketing. From a methodological point of view, this research introduces different uses of structural equation modeling and path modeling (Hair et al., 2006) to tackle research questions on the impact of credence attribute information on consumers' attitudes and buying intentions.

In the first essay, results provide evidence that credence attribute information on Michigan locally-grown has both a direct and indirect effect on consumers' attitudes towards apples. This suggests that consumers like "locally-grown" mainly because it creates inferences with other desired credence attributes, such as pesticide-free, and experience attributes, such as good flavor or firmness. This has implications for managers

seeking to obtain a benefit advantage by communicating the "locally-grown" attributes of their brand or other attributes that consumers infer from "locally-grown".

In the second essay, results suggest that credence attribute information on Liguria extra-virgin olive oil differentiates the brand of the firm providing the information in terms of attitudes and willingness-to-pay, but that credence attribute information on Southern Louisiana cream cheese does not. However, in both these cases, individual brand information related to the place-of-origin creates a higher level of brand differentiation relative to generic attribute information. This has major implications for managers seeking brand differentiation by adding place-of-origin to their products.

Finally, results from the third essay show that brand information either related or unrelated to animal welfare issues has the positive effect of mitigating the impact of negative information shocks on consumers' attitudes and intentions to buy McDonald's. However, we found that McDonald's information related to animal welfare has a more positive effect on some consumer segments, such as elder individuals with higher education. On the other hand, females with higher income are more sensitive to information unrelated to animal welfare which aims at mitigating a negative shock.

Although introducing a conceptual framework based on the theory of attitude formation as well as a structural equation and path modeling approach to the context of agri-food marketing, this research does not provide results that are highly generalizable, as they remain limited to specific products, attributes and information treatments. Future research should first test if these results hold across different products, either food or non-food, and across different credence attributes. Moreover, future research should test how results vary across various information sources, as well as across various information

contents. By undertaking this direction, future research would establish the necessary and sufficient conditions that complete the development of a theory of branding products with credence attributes.