

## RELATIONSHIP BETWEEN QUALITY SIGNALS' CREDIBILITY, TRUST IN FOOD SYSTEM ACTORS, PERCEIVED QUALITY AND INTENTION TO BUY

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**ABSTRACT:** *This paper investigates the relationship between brands/certification labels credibility, trust in food system actors, perceived quality and intention to buy food products. The sample, consists of a total of 317 rice consumers who purchase rice from modern retail outlets in cities of Saint-Louis, Thiès and Dakar. Data are collected through questionnaire and analyze through descriptive statistics, Pearson correlation coefficient, and an approach based on Ordinary Least Squares Regression and the Bootstrap Method. Brands and certification labels, considered here as two types of quality signals, are separately studied. Findings indicate that brands/certification labels credibility has a direct and positive influence on intention to buy food products that have these types of quality signals. In addition, this relationship is mediated, both separately and together, by trust in food system actors who issue these types of quality signals and perceived quality of these food products. A significant difference is found in the comparison to reveal the more powerful mediating variable in terms of mediation effect. The overall model for each type of quality signal is significant.*

**KEYWORDS:** quality, credibility, trust, food, buy.

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## INTRODUCTION

Food system actors who exert in the production, processing and distribution of agricultural food products are more and more interested in the quality of these products and in the purchasing behavior of consumers. This interest is, among other reasons, justified by the fact that, faced with the growing complexity of food systems and the growing doubts of consumers relative to the quality of food products, consumers have become very demanding regarding the quality of agricultural food products sold to them (Verbeke & al. 2007, Korthals 1990, Ugochukwu A. & Hobbs J. 2014). As a result, in Senegal, while a minority of farmers, producers (processors / agro-food producers) and distributors are more or less active in setting up strategies to differentiate the quality of their products through different quality signals, others are less interested in this strategy. This lower interest is due: either to cost concerns, or mostly to uncertainties concerning the relationship between quality signals and consumers purchasing decisions. In addition, although it is common for products to have several quality signals, consumer reactions to quality signals of food products are not yet clearly studied in Senegalese context, hence the context

justification for this research.

In social sciences such as economics and marketing, signal theory is used to explain communication between different agents of an information asymmetry market, in which market participants have different information (Larceneux 2001; Sergius Koku P. 2014). Spence (2002) defines a signal as a form of communication that conveys credible information from sellers to buyers and that can help them reduce their uncertainty about unobservable quality of a product. According to researchers in marketing and information economy (Akerlof 1970; Erdem & Swait 2016, 1998; Dawar & Parker 1994; Kirmani & Rao 2000; Hey & McKenna 1981), consumers are imperfectly informed, especially in a context where they do not benefit from all informations on product that producers, sellers, or any other actor in the product chain have. When consumers choose between competing products, they face uncertainty about the quality and performance of the product. Consumers are therefore tempted to rely on quality signals in order to judge the quality of competitors' products, given that these consumers have a limited time horizon and no effective capacity (or limited means), in order to carry out intense comparative studies before purchase. In a competitive and asymmetric information environment, the efficient use of precise signals should allow consumers to distinguish between better and lower quality products, thus motivating producers to increase the quality of their products (Akerlof 1970).

Despite the importance attached to quality signals in consumer's purchasing decision process related to product quality, several researchers have found that, in general, consumers' purchasing decisions regarding products that have quality signals are not based on the simple fact that these products have quality signals, but rather on the credibility of these signals (Tirole 1990; Martín S. & Camarero 2005; Erdem & Swait 1998, 2016). In this perspective, the credibility of several quality signals have been discussed in the economic and marketing literatures. These include warranty, price, advertising, brands and certification labels. However, brands and quality certification labels are two types of signals with high credibility according to information economy signal theory (Erdem & Swait 2016; Chameroy 2013), especially when it comes to agricultural food products (Magrini & al. 2011).

Credibility refers to a person's perception of the truth of information. This note is correlated with the recipient's willingness to attribute truth and substance to information (Hovland & al. 1953). Credibility is linked to information and can therefore be described as a phenomenon of communication. Regarding the credibility of brands, Başgöze & Özer (2012) emphasize that "credibility" is the essential characteristic of brands. Indeed, brands convey information about product attributes (physical, functional and perceptual / symbolic) and report product positioning in space of its characteristics of experience and credibility (Erdem & Swait 2016). Many authors attest that quality signal conveyed by brands differs from other individual marketing mix signals because brands embody and represent the combination of marketing mix elements and companies' past and present strategies, as well as their brand-related activities and investments (Erdem & Swait 1998, 2016, Erdem & al. 2006). According to these researchers, brands stand out from other elements of marketing mix due to the fact that they are able to incorporate the positive effects of all marketing activities, and thus become effective signals of product quality. In addition, companies that make false and dishonest brand claims would receive negative monetary consequences because consumers would punish the brand if claims are found to be false. The consumer's penalty may include negative word of mouth or request regulatory action or sanction (Rao & al. 1999, Erdem & Swait 1998).

Moreover, consumers are increasingly seeking the intervention of a trusted third party in their dealings with products suppliers or sellers, in order to certify products quality or claims of brands. Thus, in order to distinguish their brands from those of competitors in terms of high quality, some sellers voluntarily apply high quality private / public standards, and market very high quality products that have certification labels. These will enable them to report the superior quality of their products, which is therefore beyond the minimum quality standard. These certification labels are supplied by trusted third parties such as independent certification bodies and government (Bonroy & Constantatos 2012, Bonroy 2009, Caswell & Mojduszka 1996). The use of a trusted third party places consumers in a situation of delegation of judgment. They rely on this third party whose missions range from information to prescription (Chameroy 2013). Thus, the certification label by its dimensions of expertise and impartiality is a signal deemed credible by consumers (Kamins & Marks 1991; Laric & Sarel 1981; Lirtzman & Shuv-Ami 1986; Parkinson 1975).

There are some research / studies on the relationship between the credibility of these two types of quality signals (brands and certification labels), perceived quality and intention to buy (Baek & al. 2010; Moussa & Touzani 2008; Erdem & Swait 1998, 2016). However, most of these studies related to brand equity relationships, studied one brand and not brands in general. Similarly, most of these studies, related to label equity relationships are interested in a label in its micro dimension, and not labels in general. the advantage of studying brands or labels but not a specific brand or label, is that the researcher, at the end of a study, can consider having an idea of consumers' perceptions and purchase intentions concerning each brand or label, specific to the context of the study and even elsewhere. Indeed, to our knowledge, current empirical studies on the direct and indirect effects of the brand or label credibility on intention to buy products through perceived quality, have questioned consumers on a specific brand or label identified in the context of the study, and not on brands credibility or labels credibility in general.

Moreover, to our knowledge, the role of trust in food system actors who issue these two types of quality signals (brands and certification labels), in this relationship has not yet been explicitly studied, although trust is considered by some researchers to be a consequence of credibility and a determinant of intention to buy, especially in situations of risk (Dierks & Hanf 2006; Nowak & McGloin 2014).

From this research gap, the current research aims to investigate the relationship between brands/certification labels credibility, trust in food system actors who issue brands/certification labels credibility, perceived quality and intention to buy food products that have these types of quality signals.

## **THEORETICAL UNDERPINNING**

The theoretical basis of our work in the signal theory stresses the importance for companies to issue quality signals in order to fight against asymmetric information. The supplier knows the quality of his product while the buyer must infer it. This need to inform the buyer is heightened for experience or belief products or attributes. Furthermore, the effectiveness of quality signals is determined by their credibility. In the agricultural food sector, brands and certification labels are considered as two types of credible quality signals, among others, which act as informational shortcuts to reduce this asymmetry.

In this study, the modeling of the relationship between brands / certification labels credibility, trust in food system actors who issue brands / certification labels credibility, perceived quality and intention to buy food products that have these types of quality signals \_ is firstly part of brand equity and more particularly with reference to signal theory and information economy; the conceptualization of which is approached in terms of consumer attitudes and behavior (Erdem & Swait, 1998). This framework was also applied to label mainly by Carpenter & Larceneux (2008) taken over by Moussa & Touzani (2008), in reference to label equity. These frameworks and empirical studies have supported and validated the direct effect of brand credibility and label credibility on intention to buy products, and the mediating role of perceived quality of products in this effect.

Indeed, Erdem, Swait & Louviere (2002) found that brand credibility increases consumer utility (whom they also consider as intention to buy). Intention to buy and act of purchase are considered as two distinct stages, between which the link is direct and unexplained (Fishbein & Ajzen 1975; Engel & al. 1978, 2001). Furthermore, in a study carried out in Pakistan with 102 students from different universities, Sheeraz & al. (2012) find that brand credibility and consumer values are significantly and positively associated with consumer purchasing intentions. Başgöze & Özer (2012) equally find that brand credibility positively influences intention to buy high-tech products.

Perceived quality is defined as the consumer's opinion / judgment on overall excellence and superiority [of a product] (Zeithaml 1988). It is a global one-dimensional evaluative judgment that exists on a continuum rather than being a dichotomous variable, and can range from very poor to very good (Steenkamp 1990). Using signal theory, Erdem & Swait (1998) proposed, tested and validated a brand equity model which was later taken up by several other researchers. In this model, brand credibility has a significant effect on intention to buy because of its effects on perceived quality, cost of information and perceived risk. Baek&al. (2010) carried out a study of which results suggest that brand credibility and brand prestige positively influence intention to buy a brand through perceived quality. According to Erdem & Swait (2016), brand's high credibility reassures consumers by allowing them, among other things, to trust brand's claims, particularly in terms of quality.

Even though the literature on brand credibility is not rare, it is not the case for credibility of certification label. Certification labels are relevant and credible sources of quality disclosure (Rao, Qu & Ruckert 1999). The importance of credibility in the effects of labels has been observed by Carpenter & Larceneux (2008) and confirmed by the results of a study done by Moussa & Touzani (2008). The latter proposed a theoretical model which combines with signal theory and mainly with brand equity model of Erdem&Swait (1998, 2016), to assume that there is a direct relationship between perceived credibility of quality label and intention to buy product, and this relationship is explained by perceived quality of product that carries the label. Indeed, Moussa & Touzani (2008) used three different labels to test the model and the data was collected using self-assessed surveys of 602 respondents. Results showed that there are positive and significant relationships between perceived credibility of label and product's purchase intention ( $t = 3.994$ ,  $P < 0.01$ ), and between perceived credibility of label and product's perceived quality ( $t = 3.994$ ,  $P < 0.01$ ). The results also show that perceived quality plays a mediating role in the relationship between perceived credibility of the signal and intention to buy the product.

However, when it comes to a study of imperfectly informed consumer behavior, trust is an important factor (Dubuisson-Quellier 2003). Indeed, due to the increasing complexity of food chain or system, and the disengagement of consumers in food production systems, consumers must rely on actors in the food system (example: farmers, agrifood producers, distributors, government, independent certification bodies) to provide safe food (Earle 2010). Consumers are considerably distant from source of production, and trust in food system as an abstract concept is becoming more important. In addition, due to the inherent nature of purchases of food products, consumers will always face some risk. Essentially, they are betting on the uncertainty of the future and the free actions of others. In these uncertain situations, when consumers have to act, trust comes in as a solution to specific risk problems. Trust becomes the crucial strategy to face an uncertain and uncontrollable future. As Gambetta (1988) argued, trust is particularly relevant in conditions of ignorance or uncertainty about the unknown or unknowable actions of others. This trust is described by Kjærnes & Dulsrud (1998) as a “structural” or “system oriented” trust. Trust in the abstract food production system takes the form of a faceless commitment. Furthermore, according to Grayson & al. (2008), consumers are influenced not only by their trust in a company and its representatives, but also by their trust in the wider context of trade on the market.

Moreover, given the recent various food crises, trust in food system actors – issuers of quality signals is often questioned by consumers (Dierks 2005, Pichon 2006, Dierks & Hanf 2006). In addition, when consumers are faced with quality signals, they cannot be sure that they have understood it correctly or precisely; That is, informations transmitted through quality signals can be perceived, understood and assimilated imperfectly (Pichon 2006, Ederm & swait, 2016). In such a context, trust in actors of food system who emit quality signals can be a key element in consumers’ purchasing decisions concerning products which have these signals.

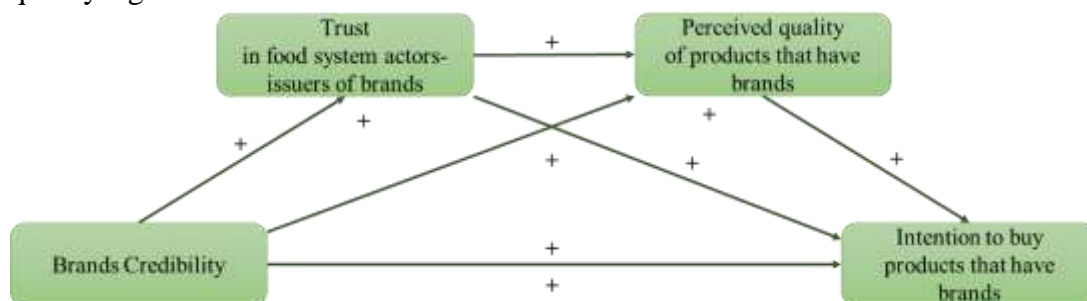
Very few researchers have explicitly linked trust with brand / label credibility, perceived quality or intention to buy. Trust is considered by some researchers to be a consequence of credibility and a determinant of the intention to buy, especially in situations of risk (Dierks & Hanf 2006; Nowak & McGloin 2014). Indeed, Rittenhofer & Povlsen (2015) stated that, in management research, “trust” and “credibility” are applied either synonymously or causally when credibility is perceived as the source of trust - and trust as a direct function of credibility. Furthermore, Dierks (2005), as well as Dierks & Hanf (2006) find that trust is a reliable determinant of consumer choice in a context of uncertainty and / or food crisis. More specifically, these researchers found that consumers take into account their trust in food system actors - issuers of quality signals - in their purchasing decisions. Indeed, based on an improvement on Ajzen's (1991) theory of planned behavior, Dierks & Hanf (2006) examined German consumers’ trust in different sources of information. Among other things, they find that trust has a positive influence on intention to buy food products in situations of uncertainty. Nowak & McGloin (2014) examined the effect of product reviews and their various images and texts (considered signals in their study) on perceived credibility, source reliability and purchase intention. They find that sources associated with images perceived to be more credible were more reliable, and that, more credible images reinforced intention to purchase. In addition, the perception of the text's credibility had a positive influence on perceived trust in the source. Thus, image credibility and text credibility are two important factors in the perception that a source is trustworthy. Finally, they found that image credibility and source trust directly predicted intention to buy. However,

the authors acknowledge that the influence of source's trust was only slightly greater than that of image perceived credibility on purchase intention.

Finally, for consumers, quality is in fact a question which concerns trust in food products (Brunsø & al. 2002; Grunert 2002). This trust would be closely linked to trust that consumers can place in quality signaling sources that are the various direct and indirect actors in food chain, depending on the signal in question (Pichon, 2006; Sirieix, 2001, De Jonge & al, 2007).

However, we have not seen any study which clearly highlights the causal relationship between the credibility of brands / certification labels, and trust in food system actors issuing brands / certification labels (farmers, agrifood producers and distributors / government and independent certification bodies). Nevertheless, based on an experimental design, Bhaduri (2011) studied the relationship between trust / mistrust towards a clothing company, perceived quality, perceived price and intention to buy. A 2X2 trust/distrust matrix was designed and each participant was exposed to four profiles in random order. 77 people were recruited. (SPSS 17) was used for all analyzes of statistical data. Results of the study indicated that trust/distrust affects consumers' intention to buy. In addition, unlike perceived price, perceived quality is a good mediator in the relationship between trust / distrust and purchase intention.

Based on the above literature review, the current research suggest a model relating brands/certification labels credibility, trust in food system actors who issue brands/certification labels credibility, perceived quality and intention to buy food products that have these types of quality signals.



**Figure 1: Hypothetical model.**

## METHODOLOGY

Within the framework of this research, we adopt a positivist epistemological posture, followed by a hypothetico-deductive methodological approach. This study is conducted based on the correlational design. Relational designs are used in order to study relationships between two or more variables.

The causal relationship among brands/certification labels **credibility** (predicting variable), **trust** in issuers of brands/certification labels (mediating variable), **perceived quality** of food products that have brands/certification labels (mediating variable), and **intention to buy** food products that have brands/certification labels (criterion variable) are the research variables that are tested via serial multiple mediation method and evaluated.

Data is collected through convenience sampling method. Convenient sampling is about selecting individuals that can easily be reached to obtain a respond in a research (Cohen, Manion& Morrison, 2007). However, the use of that method in this research is guided by a certain number of reasoned factors taking into account the specificities of Senegal's agricultural food products market. Indeed, we conducted our study in Dakar, Saint-Louis and Thiès, with regard to the study carried out by Dia&Sylla (2011), which shows that on average, the purchasing power of households of these zones is greater than those of other regions and sub regions such as Diourbel, Ziguinchor, Fatick, Kolda and Tamba. In addition, these cities contain more modern retail outlets or markets; the city of Dakar having the largest share. Data collection tool is 'questionnaire'. In consideration of tired participants the scale forms were presented in different orders, thus reducing the error ratio to be measured. Applications of the scales took 20-25 minutes. Rice was used as the food product in the current study, due to its high consumption in Senegal. We have done a Pre-test to adjust the questionnaire. SPSS version 21 is used to test the validity and reliability of measurement scales taken from the literature. Of the 317 rice consumers of modern retail outlet questioned 44.2% are female and 55.8% are male and 99.1% of participants have already consumed branded rice, while 32% have consumed rice that has certification labels. Consumers in the first group are mostly 26 to 34 years old, while those in the second group are mostly over 50 years old. Overall, the study participants mostly have a bachelor's or master's degree. The majority of participants (39%) shop in general food stores, while 3.8% shop in hypermarkets.

All measurement scales are taken from the literature. For each type of quality signal, research hypotheses are tested separately, using the same methodology as well as measurement instruments. The first exploratory analysis (1) and the first Cronbach's alpha calculation (1) is made on 158 participants, a sample from pre-test. The second exploratory analysis (2) and the second Cronbach's alpha calculation (2) is made on the final sample made up of 317 participants. In this research work, three main food system actors that issue brands are selected: farmers, agrifood producers and distributors (sellers); and two main issuers of certification labels are selected: independent certification bodies and government. Only one trust scale is used for all these actors. Scales used to measure brands credibility, perceived quality and intention to buy branded products comes from the same source as those for certification labels credibility, perceived quality and intention to buy products that have certification labels. Thus, after factor analysis and reliability test, we obtained the results presented in the following table 1.

**Table 1: Results from factor analysis and reliability test**

Variables	Measurement scales (sources)	Number of items retained	Total explained variance	Cronbach's Alpha
<b>Brands credibility</b>	Lassoued& Hobbs (2015), Lassoued (2014), Erdem&Swait (2004)	3/8	89,154 % (1) / 77,262% (2)	,937 (1) / ,842 (2)
<b>Certification labels credibility</b>		3/8	76,296 % (1) / 73,026 % (2)	,838 (1) / ,805 (2)
<b>Trust in farmers</b>	Lassoued& Hobbs (2015), Lassoued (2014), Ennew&Sekhon (2007), Morrow & al. (2004), Johnson-George & Swap (1982)	2/2	78,903% (1) / 78,001 % (2)	,733 (1) / ,718 (2)
<b>Trust in food producers</b>		2/2	87,670 % (1) / 90,064 % (2)	,859 (1) / ,890 (2)
<b>Trust in distributors (sellers)</b>		2/2	90,144% (1) / 90,365 % (2)	,890 (1) / ,892 (2)
<b>Trust in independent certification bodies</b>		2/2	86,797 % (1) / 87,306% (2)	,847 (1) / ,855 (2)
<b>Trust in government</b>		2/2	78,447 % (1) / 81,020 % (2)	,725 (1) / ,766 (2)
<b>Perceived quality of rice that have brands</b>	(Chameroy 2013)	3/3	82,369 % (1) / 83,054 % (2)	,889 (1) / ,892 (2)
<b>Perceived quality of rice that have certification labels</b>		3/3	84,916 % (1) / 83,499% (2)	,908 (1) / ,898 (2)
<b>Intention to buy rice that have brands</b>	Vo & Nguyen (2015), Dodds W. B. (2002), Grewal& al. (1998)	3/3	83,008 % (1) / 83,353 % (2)	,895 (1) / ,898 (2)
<b>Intention to buy rice that have certification labels</b>		3/3	82,159 % (1) / 83,498% (2)	,891 (1) / ,901 (2)

Results of factor analysis show that final measurement scales used for this research largely explain variables of this research, and items on these scales also have good internal consistency. Brands and certification labels, considered here as two types of quality signals, were separately studied.

The final data is analyzed using Macro PROCESS algorithm of Hayes (2012, 2013). Thus, descriptive statistics has been used in analyzing the data, and the relationships between the variables were examined using the Pearson correlation coefficient. Statistical significance of the tested models is studied through the software developed by Hayes (2012, 2013), the approach based on ordinary least-squares regression and the bootstrap method. 5000 Bootstrap analyses is



conducted through PROCESS Macro based Multiple Mediation Model 6. The significance level is set at 0.5.

## RESULTS

### Relationship related to brands

Findings obtained about the relationship between brands credibility, trust in food system actors-issuers of brands, perceived quality and intention to buy food products that have this type of quality signal are presented in figure 2.

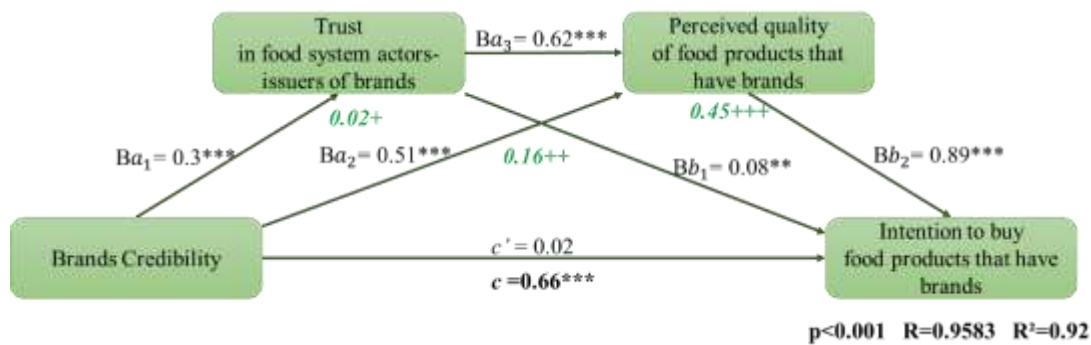
Pearson correlation analysis is carried out to define the relationships between brands credibility, trust in food system actors– issuers of brands (farmers, agrifood producers and distributors), perceived quality and intention to buy food products (rice) that have brands. Findings obtained are found in Table 2.

**Table 2: Values of the Pearson correlation coefficient for the variables in the study**

Variables	1	2	3	4
1. Brands credibility	---			
2. Trust in brands issuers	,362**	---		
3. Perceived quality of rice that have brands	,613**	,614**	---	
4. Intention to buy rice that have brands	,595**	,625**	,957**	---
Note. N=317 ** $p < .01$ (bilateral).				

Results of the correlation analysis indicates a positive low-level significant relationship between brands credibility and trust in brands issuers. In addition, significant positive relationships at an average level is observed between credibility of brands and perceived quality as well as intention to buy rice that have brands.

To determine the serial multiple mediation of trust in food system actors – issuers of brands and perceived quality of food products that have brands in the relationship between brands credibility and intention to buy the above food products, the regression – based approach and bootstrap method as recommended by Hayes (2012, 2013) is used. In this approach, non-standardized Beta coefficients are calculated in order to reduce Type 1 errors due to distribution. However, through the bootstrap method used for examining indirect effects, values obtained upon re-sampling and problems that may be due to distribution can be controlled.



**Figure 2: Serial multiple mediation of trust in brands issuers and perceived quality in the relationship between brands credibility and intention to buy, with non-standardized beta values. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$**

Figure 2 presents the results associated with the serial multiple mediation of trust in brands issuers and perceived quality in the relationship between brands credibility and intention to buy. As can be seen in Figure 2, total effect (without mediation) ( $c = 0.66$ ,  $SE = 0.05$ ,  $t = 13.12$ ,  $p < 0.001$ ) of brands credibility on intention to buy is at a significant level (Step 1). The direct effects of brands credibility on trust in brands issuers ( $B = 0.3$ ;  $SE = 0.04$ ,  $t = 6.88$ ,  $p < 0.001$ ) and perceived quality of rice that have brands ( $B = 0.51$ ;  $SE = 0.04$ ;  $t = 11.10$ ;  $p < 0.001$ ) is at significant levels. The direct effect of trust in brand issuers (first mediating variable) on perceived quality of products with brands (second mediating variable) ( $B = 0.62$ ;  $SE = 0.05$ ;  $t = 11.15$ ;  $p < 0.001$ ) is at a significant level (step 2). An examination of the direct effects of mediating variables on intention to buy rice that have brands, on the other hand, showed that the effects of trust in issuers of brands ( $B = 0.08$ ,  $SE = 0.03$ ;  $t = 2.98$ ;  $p < 0.01$ ), and perceived quality of branded rice ( $B = 0.89$ ;  $SE = 0.02$ ;  $t = 37.70$ ;  $p < 0.001$ ) is at significant levels (step 3). When the credibility of brands and the mediating variables are simultaneously entered into the equation (step 4), the relationship between brands credibility and intention to buy rice that have brands, in relation to direct effect, is not at a significant level ( $c' = 0.02$ ;  $SE = 0.02$ ;  $t = 0.71$ ;  $p > 0.05$ ). This results indicate that mediating variables mediate the influence of brands credibility on intention to buy. Moreover, the model as a whole is at a very significant level ( $F(3,13) = 1172.84$ ;  $p < 0.001$ ) and explains 92% of the total variance in intention to buy branded rice.

Furthermore, the statistical significance of the indirect effects within the tested model is examined on 5000 bootstrap samples. Estimates are taken at a 95% confidence interval and results with corrected and accelerated bias (BCa CI) shows that total indirect effect (difference between total and direct effects/ $c - c'$ ) of brands credibility on intention to buy, through trust in issuers of brands and perceived quality is statistically significant (estimation point = 0.6426; 95% BCa CI [0.5138 \_ 0.7828]).

In the tested model, when we consider the mediating variables separately and together in relation to the mediating indirect effects of brands credibility on intention to buy rice that have brands, we observe that the single mediation of trust in brand issuers (estimation point = 0.0245; 95% BCa CI [0.0050 - 0.0494]), single mediation of perceived quality of rice that have brands (estimate point = 0.4534; 95% BCa CI [0.3263 - 0.5933]), and serial multiple mediation of trust in brand issuers and perceived quality of branded products (estimate point = 0.1647; 95% BCa CI [0.0789, - 0.2783]) are statistically significant.

In addition, contrasting findings presented in pairs are included in the current research in order to determine whether specific indirect effects of mediating variables are stronger than others. Based on the current study results, three separate contrasting pairs are obtained. Results show that none of the contrasting pairs are at a zero-point estimate interval within the 95% BCa confidence interval. Thus, the said variables are found to be statistically different from each other in relation to mediating power. Indeed, considering the distinct mediations of trust in the issuers of brands or of perceived quality in the relationship between brands credibility and intention to buy, perceived quality statistically has better mediating power than trust in brands issuers. On the basis of contrasting pairs of specific direct effects, trust in brands issuers is observed to have a weaker mediation than the serial multiple mediation of trust in brands issuers and perceived quality. In another comparison, perceived quality is observed to have a stronger mediation than the serial multiple mediation of trust and perceived quality.

### Relationship related to certification labels

Findings obtained about the relationship between certification labels credibility, trust in food system actors—issuers of certification labels, perceived quality and intention to buy food products that have this type of quality signal are presented in figure 3.

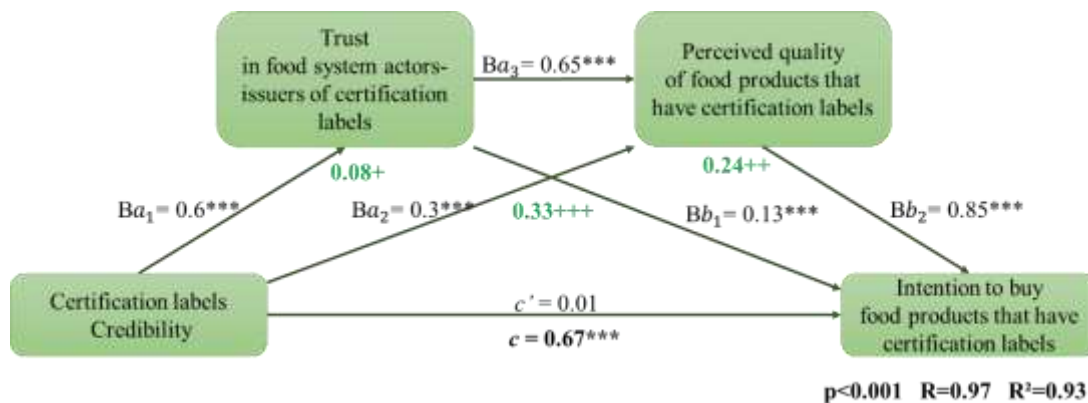
Pearson correlation analysis was carried out to define the relationships between the credibility of certification labels, trust in issuers of certification labels (government and independent certification body), perceived quality and intention to buy rice that have certification labels. Results obtained are shown in Table 3.

**Table 3: Values of Pearson correlation coefficient for studied variables**

Variables	1	2	3	4
1. Certification labels credibility	---			
2. Trust in issuers of certification labels	,466**	---		
3. Perceived quality of rice that have certification labels	,585**	,835**	---	
4. Intention to buy rice that have certification labels	,569**	,846**	,962**	---

Note. N=317 \*\*  $p < .01$  (bilateral).

Results of the correlation analysis indicate a positive low-level significant relationship between the credibility of certification labels and trust in issuers of certification labels. In addition, significant positive relationships at an average level are observed between the credibility of certification labels and perceived quality as well as intention to buy rice that have certification labels. On the other hand, significant positive relationships at a high level are observed between trust in issuers of certification labels and perceived quality as well as intention to buy food products (rice) that have certification labels. Finally, a significant positive relationship at a very high level between perceived quality and intention to buy is highlighted.



**Figure 3: Serial multiple mediation of trust in certification labels issuers and perceived quality in the relationship between certification labels credibility and intention to buy, with non-standardized beta values. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$**

Figure 3 presents results associated with serial multiple mediation of trust in issuers of certification labels and perceived quality in the relationship between certification labels credibility and intention to buy. Figure 3 shows that the total effect (direct effect without mediation) ( $c = 0.67$ ;  $SE = 0.05$ ;  $t = 12.26$ ;  $p < 0.001$ ) of the credibility of certification labels on intention to buy is at a significant level (Step 1). In addition, the direct effects of certification labels credibility on trust in issuers of certification labels ( $B = 0.6$ ;  $SE = 0.06$ ;  $t = 9.35$ ;  $p < 0.001$ ) and perceived quality of rice that have certification labels ( $B = 0.29$ ;  $SE = 0.04$ ;  $t = 7.76$ ;  $p < 0.001$ ) is at significant levels. The direct effect of trust in issuers of certification labels (first mediating variable) on perceived quality of rice that have certification labels (second mediating variable) ( $B = 0.65$ ;  $SE = 0.03$ ;  $t = 22.33$ ;  $p < 0.001$ ) is at a significant level (step 2). The direct effects of the mediating variables on intention to buy rice that have certification labels shows that the effects of trust in issuers of certification labels ( $B = 0.13$ ;  $SE = 0.02$ ;  $t = 5.29$ ;  $p < 0.001$ ) and perceived quality ( $B = 0.85$ ;  $SE = 0.03$ ;  $t = 28.46$ ;  $p < 0.001$ ) are at significant levels (step 3). When the credibility of certification labels and all the other mediating variables are simultaneously entered into the equation (step 4), the relationship between certification labels credibility and intention to buy rice that have certification labels, in relation to direct effect without mediations (total effect), is not significant ( $c' = 0.02$ ;  $SE = 0.02$ ;  $t = 0.76$ ;  $p = 0.45 > 0.05$ ). Results indicate that the mediating variables effectively mediate the relationship between certification labels credibility and intention to buy food products that have certification labels. In addition, the model as a whole is at a very significant level ( $F(3,13) = 1418.35$ ;  $p < 0.001$ ) and explains 93% of the total variance intention to buy rice that have certification labels.

The statistical significance of the indirect effects within the tested model is examined on 5000 bootstrap samples. Estimates are taken at a 95% confidence interval and results with corrected and accelerated bias (BCa CI) shows that total indirect effect of certification labels credibility on intention to buy, through trust in issuers of certification labels and perceived quality of rice that have certification labels was statistically significant (point of estimation = 0.6571; 95% BCa CI [0.5470 \_ 0, 7488]).

In this last model, when we consider mediating variables separately and together in relation to indirect mediating effects of certification labels credibility on intention to buy, we observe that single mediation of trust in issuers of certification labels (estimation point = 0.0787; 95% BCaCI

[0.0248-0.1483]), single mediation of perceived quality of rice that have certification labels (estimation point = 0.2471; 95% BCa CI [0.1777, - 0.3202]) and serial multiple mediation of trust in issuers of certification labels and perceived quality of rice that have certification labels (estimation point = 0.3314; 95% BCa CI [0.2474, - 0.4162]) are statistically significant.

Furthermore, when the mediations of trust and perceived quality were made separately in the relationship between credibility of certification labels and intention to buy, it emerged from the contrast that perceived quality of rice that have certification labels statistically has better mediating power than trust in issuers of certification labels. Contrasts made at the level of serial multiple mediation shows that trust alone had a weak mediating power than serial multiple mediation through trust and perceived quality. Likewise, perceived quality alone had less power of mediation than serial multiple mediation. Results showed that none of the contrasting pairs are at a zero-point estimate interval within the 95% BCa confidence interval; thus, these contrasts is statistically significant.

## **DISCUSSION**

In some studies it has been found that brand credibility has a direct positive and significant effect on intention to buy (Başgöze & Özer 2012; Sheeraz & al. 2012). Similarly, our results agree with those of Moussa & Touzani (2008) who found that label credibility has a direct positive and significant effect on intention to buy. Furthermore, our results are in line with those of Baek & al. (2010) and Moussa & Touzani (2008) respectively who found that perceived quality of products that have brand and label explains the intention to buy these products following the perceived credibility of these signals. Findings of this paper shows that the effect of trust on perceived quality is positive and highly significant. Thus, findings agree with those of Jazi (2003) who made the link between trust in point of sale and product perceived quality. Our results on the mediating role of trust in signal issuers (brands and certification labels) in the relationship between the credibility of these signals and purchase intention agree with the results of Nowak & McGloin (2014) in a superficial manner, because the relationship between the two studies is much more accentuated in the meaning and significance of the variables than in the objective of the studies.

### **Implication to research and practice**

Results highlight the value of using product branding strategy and product certification strategy. Results also encourages food system actors to gain consumers' trust because of its influence on products perceived quality and intention to buy. It is also recommended to food system actors - issuers of brands and operating as businesses, not only to focus on promoting the credibility of their brand as "intellectual property", but on promoting the credibility of brands as "a type of credible quality signal". Doubtful brands should be denounced, sanctioned and removed from the market, for them not to reduce consumers' trust in these actors; which could have a negative effect on products perceived quality and intention to buy. The same recommendation also goes for certification labels.

## **CONCLUSION**

Based on the current research findings, there exist a positive relationship between all variables in this research. The serial multiple mediation of trust and perceived quality and the separate

mediation of single mediating variables is found statistically significant in the relationship of brands and certification labels credibility with intention to buy. Based on the contrasting pairs of specific indirect effects, the sizes of mediating effects of trust and perceived quality is found to statistically differ from each other in relation to brands and certification labels credibility in each of the tested models. On the other hand, separate single mediations of trust and perceived quality is found not to be stronger than their serial multiple mediation together. Given the comparative effects between certification labels and brands, our results seem to suggest that in Senegal, certification labels are more important to consumers than brands when it comes to the credibility of quality signals and trust in issuers of these signals. On the other hand, perceived quality of products which have brands seems slightly more important than that of products which have certification labels. This situation is probably justified by the fact that in Senegal, compared to certification labels, brands are the most used quality signals by actors supplying agricultural food products, while the use of certification labels for signaling quality is still in its embryonic stages.

### Future research

Relationships found in this paper should be tested in different contexts - with different products - using different types of sample - over time, so as to test their generalization. Indeed, in our results, we find that trust in food system actors has a very small influence on intention to buy, although it is positive and significant. The reason for this may be that in Senegal, when data was being collected, there was no major risk situation concerning rice sold in the market. However, according to Dierk (2005), trust has a better effect on intention to buy when there is a situation of risk. Future research could lead the study into a high-risk situation with regard to rice in Senegal, and compare their results to the current study's result.

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