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## **Food purchase for natural disaster relief: the case of Parmigiano-Reggiano sales in the aftermath of the 2012 earthquake waves**

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### **Summary**

*The May 2012 earthquake waves shaking the North-East part of Italy have caused 26 deaths and diffuse economic damage in the traditional production area of Parmigiano-Reggiano PDO, including several dairies warehouses where the cheese is produced and aged. It has been estimated that losses to the Parmigiano-Reggiano system exceeded 150 millions Euro. In the broad mobilization to help the stricken people, the agri-food system played a primary role, giving rise to the sales of “Parmigiano-Reggiano damaged by earthquake” (PR-T). This paper aims to investigate the main determinants of PR-T purchasing using the theory of planned behaviour (TPB) as a conceptual framework. A preliminary focus group and a survey on 200 consumers were performed for this purpose; data were collected with face-to-face interviews in stores and markets where the PR-T has been sold. The relative importance of attitude, descriptive norms and perceived behavioural control (PBC) in influencing the intention to purchase PR-T and the behaviour itself where investigated. Other concepts were added to the analysis, such as formal and informal trust, moral attitude, PDO perception, sense of belonging to the region, and other socio-economic variables. The revised TPB model predictors accounted for 70% of the variance of intentions to purchase PR-T in the future and 32% of the variance of behaviour. PBC, trust in formal communication sources and PDO quality warranty are the main predictors of intentions. Behaviour is positively affected by descriptive norms, sense of belonging, age and intentions, and negatively determined by food scare, past behaviour and educational level. These empirical findings provide evidence of the solidarity aspects of collective purchases of Parmigiano-Reggiano in the aftermath of the 2012 earthquake waves, as well as the importance of increasing people’s capability and trust to effectively reach the goal of facing dreadful food scares.*

Keywords: protected designation of origin (PDO), theory of planned behaviour (TPB), solidarity, trust, food scare.

JEL Classification codes: D12 - Consumer Economics: Empirical Analysis

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## **1. INTRODUCTION**

Emilia-Romagna region is well known for its production of traditional food products, and Parmigiano-Reggiano is one of the most recognized worldwide. Unfortunately, Emilia-Romagna gained widespread national and also world media coverage starting since May 2012 for a prolonged earthquake waves that caused 26 deaths and diffuse damage. The earthquakes have also damaged several dairies warehouses where Parmigiano-Reggiano is produced and aged; the Consortium has estimated that the loss to the Parmigiano-Reggiano system exceeded 150 million Euro. Damage to the product is certainly the most significant part, since 633,700 wheels fell off shelves (about 20% of annual production) and five dairies were declared unfit for use (Consorzio Parmigiano-Reggiano, 2012a). The damaged product, named “Parmigiano-Reggiano Terremotato” (PR-T, namely “Parmigiano-Reggiano damaged by earthquake”) referred to serious impairment of wheels either 1) below the minimum period of maturation defined by the Protected Designation of Origin (PDO) standards (12 months) that, therefore, were melted or grated, with a loss of about 6 €/kg, or 2) already rated as PDO which, due to the damage, were sold at discounted price, with an estimated 2 €/kg loss.

In the broad mobilization to help the stricken people, the Parmigiano-Reggiano system played a primary role. For instance, large retailers agreed with the Consortium that for each wedge of Parmigiano-Reggiano sold at the current prices, a contribution of 1 €/kg was devoted to the dairies hit by the earthquake (Consorzio Parmigiano-Reggiano, 2012b). Moreover, for those who wanted to buy cheese directly from the damaged dairies, the Consortium made available on the internet a list of the dairies concerned in order to avoid frauds or speculations, while maintaining a proper governance in crisis situation. The Consortium strategy was to sell this product as a generic cheese and not with PDO label.

In the meanwhile, Coldiretti, the major Italian Farmers' Union, managed Alternative Food Networks (AFN) and direct-selling channels, relying more on informal trust in the producers and on word-of-mouth mechanisms. This gave rise to the properly called “PR-T sales” (an expression never officially recognized by the Consortium) which entails aspects of bottom-up, self-organising approach, distant from the top-down, official governance model of the Consortium. Such sales were made both in farmers' markets, in Coldiretti's Farmers' Shops (“Botteghe di Campagna Amica”) and also on the internet (collective purchases) and were characterized by deep emotional participation by local consumers.

In many cases, evidence shown that environmental disasters can trigger dreadful food scares (e.g., buffalo mozzarella contaminated by dioxins in Campania in 2008, Tsunami and Fukushima accident in 2009, etc.). It is unclear why some disasters resulted in food scares and other didn't, even if there are interesting and promising clues on that (artificial vs. natural occurred, etc.). Consumption and purchasing of PR-T could

be seen as a way to help stricken communities in face of natural disasters, while strengthening social relations and the sense of being part of the same community. This implies a different but complementary reassurance framework with respect to more formalised, hierarchical actions stemming from the Consortium, which communication nevertheless acted as an umbrella on all the producers, regardless the sale channels used. Fears deriving from the natural phenomenon itself, and also from the food safety perception of Parmigiano-Reggiano, were hence not given ground to thrive.

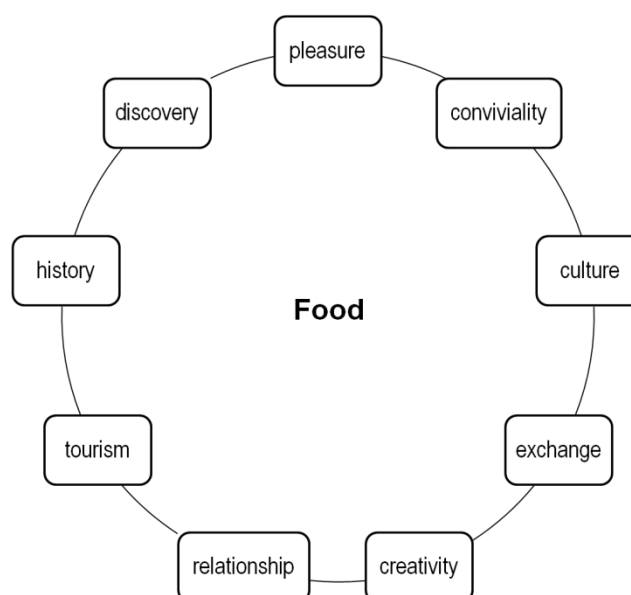
This paper aims to investigate the main determinants of “Parmigiano-Reggiano damaged by earthquake” (PR-T) purchasing; the theory of planned behaviour (TPB) (Ajzen, 1991) was used as a conceptual framework. Thus, the relative importance of attitude towards the behaviour, subjective norm and perceived behavioural control (PBC) in influencing the intention to purchase PR-T and the behaviour itself where investigated. Moreover, other concepts were added to the model analysis, such as formal and informal trust, moral attitude, PDO perception, sense of belonging to the region, as well as other socio-economic variables.

## 2. METHOD

### 2.1. Preliminary qualitative analysis

After a literature review, authors performed an initial focus group in November 2012, with ten consumers covering topics within food and Parmigiano-Reggiano purchases such as, among other things: risk perception, formal and informal reassurance mechanisms both in general and after the earthquake, as well as solidarity aspects involved.

**Figure 1:** Semantic map of food perception based on focus group results.



Source: own elaboration.

The focus group has been carried out with the help of visual and verbal stimuli (questions, statements to be commented, pictures of damaged Parmigiano-Reggiano wheels as appeared on newspapers, wasted

warehouses, sales in farmers' markets, etc.), going in-depth into the emotional aspects permeating the statu nascenti consumers' response (i.e. willingness to purchase). Apart of motivational aspects, traits linked to food safety and quality perception have been tested as well, along with the role of information sources in giving frame to the whole issue.

The semantic map surrounding the very concept of “food” allowed some broader reflections: common expectations regarding food include *relationships, friendship, conviviality and culture*. In turn, this reflects the *intrinsically social* background of food: out of 9 concepts expressed, 5 relate to social aspects (Figure 1). Sociological studies are well aware that consumption can be seen as a ritual, able to maintain the social structure of a society (Baudrillard, 1970; Levi Strauss, 1962). Furthermore, goods have a symbolic value more than value of use and can be conceived as instruments and tools *to think*. Consumption can also be framed also as activation of exchange among persons (Mauss, 1925), “by exchange of goods relations are established between individuals, clans: it creates the society”. Those aspects make interesting a deeper analysis on solidarity aspects during extraordinary conditions. Preliminary conclusion of the focus group are the following:

- Parmigiano-Reggiano resulted to be an everyday companion for the whole group, yet able to express its potential during special festivities and celebrations. This denotes its intrinsic perception of quality, confirmed also by the gift-status granted, and differently from similar cheeses of apparently similar quality/destination of use.
- Food safety has not be a key issue. Parmigiano-Reggiano is perceived as a solid, intrinsically “safe” product, not easily under attack for hygienic and food safety aspects: able to be stored and conserved for long time without perishability problems. This may have led to a different framing of risks perception after the earthquake. Regarding the search of information on food safety and quality aspects in the aftermath of the earthquakes, respondents agreed that they no focused rationally on these. Stressing an embryonic hierarchy of priorities, according to the principle: *first relief and solidarity to producers, then concerns on hygienic aspects*. Interestingly, it appears that a *multi-level risk-benefit assessment* has been conducted, coherently with assumptions emerged in literature (Hansen et al., 2003, Renn, 1999, Slovic, 2000).
- Parmigiano-Reggiano is considered as a “socially-embedded” product: being a “local”, “genuine” and handcrafted product, with a tacit intergenerational know-how transmitted along centuries. Its wide ways of consumption exalt its “public” dimension, and conviviality. It can be stated that it is a food with “high relational density” potential, able to activate social networks (the food chain, the territory, the consumers and gastronoms, etc), hence intrinsically able to express solidarity in its widest meaning.
- Consumers seemingly activated complex action schemes, and heuristics able to take into account a the same time different risks (e.g., food safety, jobs losses, warehouse wastes, etc.) and benefits (e.g., personal health, economic aid to producers affected by the earthquake, hedonistic pleasure, spiritual reward, participation, etc.).
- Spontaneous activation of social networks is a salient trait of the earthquake aftermaths. In particular, colleagues at worksites cooperated in collective solidarity purchases, mostly directly from the producers, and starting from internet-based messages of Parmigiano-Reggiano producers showing the images of their warehouse and asking for buyers of the cheese. This seems noticeable in particular because occurring during a prolonged stagnation of the Italian economy, which made probably the solidarity feeling more effective. Solidarity and social networks, via famers' market and direct sales-

acted as a trust reassurance mechanism better than traditional market channels (i.e., traditional shops, large scale retailers, etc.). In such cases, initiatives of solidarity from supermarkets were felt as not genuine and more as a marketing trick than a real commitment to relief.

## 2.2. Study design

Based on the literature review and focus group results, we have developed a questionnaire submitted to 200 consumers. Data were collected during January 2013 with face-to-face interviews performed in stores and markets where the Parmigiano-Reggiano damaged by earthquake has been sold by three trained interviewers. After removing incomplete questionnaires, the final sample consisted of 186 respondents, 62% of which were females, 50% had higher secondary and 37% tertiary education. The mean age was 37 (sd 13.5) years; mean family size was 3.3 members (sd 1.3), and children in household, with less than 12 years, were 0.3 on average (sd 0.7). 63% of respondents were born and 78% are living inside the traditional area of Parmigiano-Reggiano production. Mean distance from earthquake epicentre (i.e. kilometres from Mirandola, a village in Modena Province) is 54.6 km (sd 90.5) (Table 1).

**Table 1.** The sample.

	Freq. (%)	
<i>Gender</i>		
Males	37.6	
Females	62.4	
<i>Educational level</i>		
Primary or Lower secondary	12.4	
Higher secondary	50.5	
Tertiary	36.6	
<i>Past behaviour (frequency of purchase)</i>		
More than twice a day	10.2	
Twice a day	8.6	
Once a day	32.8	
More times a week	32.8	
Less than once a week	2.7	
Several times a month	8.6	
Less than once a month	3.8	
Never	0.5	
<i>Born inside the traditional area (%)</i>	63.4	
<i>Residence inside the traditional area (%)</i>	78.0	
<i>Did you purchase the Parmigiano-Reggiano damaged by earthquake (% yes)</i>	49.5	
<i>Where did you purchase the Parmigiano-Reggiano damaged by earthquake:</i>		
Supermarkets	30.4	
Traditional retail	12.0	
Farmers market	32.6	
Internet	6.5	
Other (e.g., friends, group of consumers, etc.)	18.5	
	Mean	Std
<i>Age</i>	37.17	13.54
<i>Family size</i>	3.27	1.29
<i>Children in household (&lt; 12 years)</i>	0.30	0.74
<i>Distance from epicentre (km)</i>	54.64	90.50

Source: own elaboration.

*Past behaviour* was measured as the frequency of consumption of Parmigiano-Reggiano (Honkanen et al., 2005). The participants were asked to state “How many times on average during the last year have you consumed Parmigiano-Reggiano”. More than a half of respondents (52%) stated to consume this PDO cheese

at least once a day, while 33% more times a week; thus, only 15% of respondents stated to consume Parmigiano-Reggiano less than once a week. This data is also confirmed by the high market penetration rate, i.e. the ratio between the number of families who buy Parmigiano-Reggiano vs the total number of monitored families, that in Italy is around 75% (C.R.P.A., 2013).

Almost half of survey respondents have purchased some Parmigiano-Reggiano damaged by earthquake during the last months. One third of those who purchased PR-T, have bought it in farmers' markets or in supermarkets; however, many people purchased it in traditional food shops or from other sources (e.g., friends, colleagues, groups of consumers, etc.). This high variability of purchasing sources shows the broad mobilization to help the stricken people, as well as the deep emotional participation by local consumers demonstrated by the run on damaged Parmigiano-Reggiano wheels.

### 2.3. Measures

The Theory of Planned Behaviour (TPB) considers intention as the central factor in performance of a given behaviour, e.g. to purchase the Parmigiano-Reggiano damaged by the earthquake, and is guided by attitudes, perceived pressure from social groups and perceived ability to perform the behaviour (Ajzen, 1991). Since one of the major critics of the TPB is that this framework is able to capture intentional and rational behaviour, while overlooking emotional variables such as fear, scare, and negative or positive feelings, other aspects have been tested in this study, such as the rationality behind the purchase (convenience or solidarity-driven), the role of food-scare "signals" (food safety or frauds concerns), the presence of a multi-level risk-benefit assessment able to balance-out the food scare and sustain PR-T consumption in spite of scaring images shown by the media (e.g., heavily damaged dairies and wheels, mould on the cheese, collapsed warehouses, etc.). The Cronbach's alpha was calculated to assess the internal consistency of these constructs (Table 2).

The *behaviour* was measured by the observed quantity (kg) of damaged Parmigiano-Reggiano purchased by the respondents (Table 2).

*Attitude* towards the behaviour refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991: 188), i.e. purchasing the damaged Parmigiano-Reggiano (PR-T). Attitude was assessed with five semantic differential scales, e.g. purchasing PR-T is bad-good, unhealthy-healthy, risky-safe, unpleasant-pleasant, expensive-cheap. All items were scored on a 5-point Likert scale (from 1 to 5), associating a more positive attitude with a higher score. An alpha coefficient of 0.88 indicates a very good internal consistency of the construct. We have also considered the positive *moral attitude* of consumers to help stricken people and companies by purchasing PR-T. This construct, adapted by Arvola et al. (2008), aims to measure favourable self-evaluations arising from anticipated compliance with moral principles. The applied two items were "Purchasing PR-T would help economically:" alternatively "stricken people" and "stricken industries and shops"; both items were scored on a 5-point Likert scale (1 = totally disagree, to 5 = totally agree). The internal consistency of these items, as revealed by the alpha coefficient (0.80), is also very good.

The second predictor considered by the TPB is the subjective norm, that is the perceived social pressure to perform or not to perform the behaviour (Ajzen, 1991: 188). A meta-analysis have shown that among the TPB components, subjective norms are the weakest predictor of intentions and behaviour (Armitage and Conner, 2001); this result was also found in the food consumption context, e.g. fruit consumption (De Bruijn, 2010; Menozzi and Mora, 2012). Another meta-analysis has provided evidence that

*descriptive norms*, that is what significant others themselves do in terms of the specific behaviour, significantly increased the variance explained in intention after other variables had been taken into account, in particular when health risk behaviours are considered (Rivis and Sheeran, 2003). For this reason, we have decided to consider three items designed to capture whether other people relevant for the respondents have purchased damaged Parmigiano-Reggiano. Respondents were asked to what extent they agreed (1 = totally disagree, 5 = totally agree) whether “people important to me (parents, friends, partner, etc.)”, “other people in my town” and “other people in the shops” have purchased PR-T. The internal consistency of the scales is very good (alpha 0.84).

The importance of actual behavioural control by individuals is stressed by the TPB. In this context, the *perceived behavioural control (PBC)* construct refers to the individual’s perception of the ease or, on the contrary, difficulty of performing the behaviour of interest (Ajzen, 1991: 183). In particular, we have asked respondents, on a 5-point Likert scale (1 = totally disagree, 5 = totally agree), whether they knew shops, groups of consumers and producers where they could buy PR-T. The PBC scale has very good internal consistency reliability (alpha 0.80).

*Intentions*, according to the TPB, are assumed to capture the motivational factors that influence a behaviour; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behaviour (Ajzen, 1991: 181). In general, the stronger the intention to engage in a behaviour, the more likely should be its occurrence. We asked participants whether they agreed or not (1 = totally disagree, 5 = totally agree) with the following two statements: “I intend to purchase PR-T in the future” and “I am sure I’ll purchase PR-T in the next weeks”. Internal consistency of these two items is clearly satisfactory (alpha 0.76).

Then we have also investigated the role of the media, institutions and peers information in shaping consumers trust and thus the behaviour, i.e. PR-T purchase. For instance, Lobb et al. (2007) have found that trust in food safety information as provided by media, alternative sources and independent authorities significantly impact the likelihood to purchase; in particular, when a food scare occurs, trust in information provided by formal bodies (such as the national or European Food Safety Authority), moderates the scare impact, especially for consumers with higher education levels (Lobb et al., 2007). Thus, formal communication (Parmigiano-Reggiano Consortium, Public Health local services, etc.) and informal communication sources (word of mouth, friend-of-a friend, social networks, etc.), were analyzed to assess the most effective trust-establishing mechanism. We have distinguished *trust in formal sources*, asking respondents if they were reassured about the hygienic and quality properties of damaged Parmigiano-Reggiano by sanitary authority, Parmigiano-Reggiano Consortium, mass media and supply chain actors (producers, traditional retailers and supermarkets) communications and, on the other hand, if they trusted more *informal channels*, such as “other people close to me, working in the PR supply chain”, and “other people making collective purchases”. These items were measured on a 5-points Likert scale with the end poles labelled “1 = totally disagree, to 5 = totally agree”. Both constructs, formal and informal trust, have shown a good internal reliability (respectively, alpha = 0.75 and 0.74).

With regard to *perceived food scare*, the assumption was to test if the messages and images –as shared by media and television- of damaged cheese in the warehouse could trigger an emotional expectations in terms of diminished food safety. Food scares are a recurrent and qualifying argument inside the present food discourse. Literature addressed aspects of media role in diminishing or increasing food scare impact (Beardsworth, 1990; Frewer et al., 1993; Frewer et al., 2002; Lobb et al., 2007; Mazzocchi et al., 2008), food chain players role and trust reassurance (Bocker et Hanf, 2000; Duffy et al., 2005; Miles and Frewer, 2001).



Scope of the current paper is to investigate both the positive or negative spin of the media framing versus the perceived food scare; as well as to assess the specific role of key-players along the food chain in granting trust (e.g., producers, retailers, wholesalers). Eventually, it has deemed useful to test if a wider environmental scare, like earthquake fear, was transmitted to food (scare), or not. In fact we do not know if there was a food scare mitigated at some level after, or if absolutely it didn't appear at the very starting point. This is also a new field of investigation, with no background. Fear can propagate in irrational ways, without even the most basic foundations. In particular, heuristics and cognitive shortcuts may be biased in condition of uncertainty, panic and stress (Mathews et al., 1995; Mathews and Mackintosh, 1998; Warda and Bryant, 1998; Smith and Bryant, 2000). Anecdotal, preliminary evidence (e.g., Tsunami and Fukushima event 2009; Chernobyl 1987, Avian flu and poultry consumption 2006; Buffalo mozzarella and dioxins in Campania region 2008, etc.) shows how in the past environmental scandals and incidents resulted also in food scares *when* proved established a degree of contamination (*from environment to food*). Thus, we have asked respondents if they were worried (1 = totally disagree, to 5 = totally agree) about 1) safety and 2) frauds of Parmigiano-Reggiano because of the earthquake. Internal consistency reliability of these two items is satisfactory (alpha 0.73).

Parmigiano-Reggiano is a PDO product with strong image and high brand awareness. We hypothesise that the *quality warranty* of the Parmigiano-Reggiano PDO label has distinctive effect on the rational intention to purchase the PR-T (van Ittersum et al., 2007). Consumers beliefs about the PDO label were measured on a 5-points Likert scale (with the end poles labelled 1 = totally disagree, to 5 = totally agree), by asking participants if they agreed that the PDO label for Parmigiano-Reggiano 1) guarantees the origin, 2) preserves a higher quality, 3) guarantees the traditional production method, and 4) protects the authenticity of the product. The PDO quality warranty scale has shown a very good internal consistency (alpha 0.81).

As we have seen before, 63% of respondents are born and 78% live inside the traditional area of production of Parmigiano-Reggiano. Van Ittersum (2001) found a positive relation between consumers' sense of belonging to a product's region of origin and his or her intention to purchase the regional product. Thus, we hypothesise that consumers' *sense of belonging* to the region of origin affects the intention (rational) and the PR-T purchase (behaviour). Adapting the scale proposed by van Ittersum (2001), respondents were asked if they agreed, on a 5-points Likert scale, with the following items: "I love my region", "My heart belongs to my region" and "I feel especially attached to my region". An alpha coefficient of 0.90 was reported showing a very good internal reliability. The high reliability demonstrated by the alpha coefficients, all above the generally considered cut-off value of 0.60, shows that the number of items included in the analysis provided an accurate measure of the constructs.

Finally, we have included three more items in the analysis. First we have assessed with two items the self-reported status of participants, asking the subjective evaluation of one's own *health* and *wealth* (1 = very bad health/wealth status, 5 = very good health/wealth status). Results shown a good self-reported health and a slightly satisfactory wealth status of participants (respectively mean = 4.26 and 3.36). Then, we have investigated if respondents found a *price advantage* in purchasing PR-T, asking whether or not purchasing PR-T allowed consumers to buy the PDO at lower prices (1 = completely disagree, to 5 = completely agree); the reported mean value of 3.60 (std dev 1.09) shown that participants envisaged some price advantage in buying PR-T.

## 2.4. Data analysis

We employed the one-way analysis of variance (ANOVA) to determine significant differences between the construct means dividing the sample between those who purchased the Parmigiano-Reggiano damaged by earthquake, and those who didn't buy it.

Then, we have applied structural equation modelling (SEM), using AMOS 20.0, to test for the relative importance of intention and behaviour determinants. SEM is a statistical methodology that takes a confirmatory (i.e. hypothesis testing) approach to the analysis of a structural theory on a specific phenomenon (Byrne, 2010). This technique allows the representation of theoretical constructs, such as attitude, subjective norm or intention, that cannot be observed directly (Menozzi and Mora, 2012). These latent variables can be inferred by observed variables, e.g. measured scores to a questionnaire item, that can serve as indicators of the underlying construct which they are presumed to represent (Byrne, 2010: 4). SEM allows for the specification of regression structure with both latent and observed variables, representing relationships among variables using path diagrams, where circles generally indicate latent variables, while rectangles represent observed or measured variables. This method allows to model relationships among latent and observed variables and statistically tests the hypothesized theoretical model and assumptions against empirical data by means of confirmatory factor analysis (CFA).

The primary task is to test the plausibility of the theoretical model based on sample data or, in other words, the goodness-of-fit between the hypothesized (restricted) model and the observed data (Byrne, 2010). It is generally recommended that this task considers various overall fit indices; in this case, model fit was assessed with  $\chi^2/\text{degrees of freedom}$  ( $\chi^2/\text{df}$ ), comparative fit index (CFI) and root mean square error of approximation (RMSEA). Values of  $\chi^2/\text{df} < 2$ , CFI  $> 0.90$  and RMSEA  $< 0.08$  indicate an adequate model fit, while a good model fit is obtained when the  $\chi^2/\text{df}$  is close to 1, the CFI is  $> 0.95$  and the RMSEA is  $< 0.05$  (Byrne, 2010). The  $R^2$  was used to measure the proportion of variance in the endogenous (dependent) variable accounted for by the set of exogenous (independent) variables.

The items were divided using the predefined categories specified in the TPB (attitudes, descriptive norm, PBC, intention) and other latent variables (i.e., food scare, PDO quality warranty, formal and informal trust, and sense of belonging). Principal component analysis, with varimax rotation, have supported the distinction among the variables. Other socio-economic determinants, such as age, educational level, health and wealth status, were also used as determinants of PR-T purchase. The TPB model was tested including other predictors, suggesting the following expectations. In accordance with the original TPB model (Ajzen, 1991), attitude towards behaviour, descriptive norms and perceived behavioural control (PBC) should be significant predictors of intention to purchase PR-T (H1). Behavioural intentions is also assumed to be positively affected by trust in formal and informal communication sources regarding the hygienic and quality properties of damaged Parmigiano-Reggiano (H2), PDO quality warranty (H3), consumers' sense of belonging to the region of origin and their moral attitude to help stricken people and companies (H4); intention is assumed to be negatively affected by food scare (H5), i.e. a higher food scare would result in a lower intention to purchase PR-T. PBC, descriptive norms and intention are also expected to be predictors of behaviour, i.e. PR-T purchase (H6). Behaviour is also expected to be influenced by formal and informal trust (H7), sense of belonging and moral attitude (H8). Past behaviour and price advantage (H9) should also emerge as a significant positive predictors of behaviour, since a stronger frequency of consumption of Parmigiano-Reggiano and a stronger perception to purchase a cheaper product should result in a higher quantity of purchased PR-T. Food scare is assumed to negatively affect behaviour (H10). On the other hand, we expect a positive effect of wealth and health status have on behaviour (H11), since a lower self-reported

health and wealth status could virtually discourage the purchase of a risky product such as PR-T. Finally, other socio-demographic variables are expected to be predictors of behaviour (H12), either positive, i.e. age and family size, and negative, i.e. education, children in household and distance from epicentre.

Three models have been tested to accept or reject the previous hypothesis. Model 1 considers the traditional TPB model, with attitude, descriptive norms and PBC determinants of intentions, and intentions, PBC and descriptive norms predicting behaviour. Model 2 adds formal and informal trust, and PDO quality as predictors of intention and formal and informal trust, health and wealth status as determinants of behaviour. Finally, Model 3 is the more complex one, including other variables predicting intention (sense of belonging, moral attitude and food scare) and behaviour (food scare, sense of belonging, moral attitude, past behaviour, price advantage, age, education, family size, children in household and distance from epicentre).

### 3. RESULTS

#### 3.1. Descriptive analysis

Descriptive statistics for the TPB and other constructs are shown in Table 2. We have already indicated that about half of survey respondents have purchased some Parmigiano-Reggiano damaged by earthquake, during the last months. The total quantity purchased by the respondents was 820 kg, with mean value of 4.4 kg (sd 24 kg). However, after having removed two outliers who purchased more than 100 kg of PR-T (in one case because it was used in a restaurant, and in another case since the respondent acted as a collective purchases leader), the mean purchase of PR-T was 2.2 kg (sd 5.2). For these reasons, we have decided to exclude these two cases from the following analysis.

Respondents shown a positive attitude towards purchasing PR-T; the mean value of these items is 4.06, showing a general agreement among respondents (Table 2). The moral attitude, that is the willingness to help economically stricken people and companies, was also favourable among participants (mean value 3.95). The descriptive norm, expressed by the social influence of important other people in performing the behaviour, is also positive, in particular the item indicating other people in respondents' town having purchased PR-T. Perceived behavioural control (PBC) shows a low value (2.57), with a quite significant variability (sd 1.16) indicating that not all consumers knew shops or other means to buy the damaged Parmigiano-Reggiano. Intention to purchase in the future PR-T is quite high (3.88), while not all consumers are sure to purchase PR-T in the following weeks (2.81).

Results show that respondents generally prefer formal communication sources (mean 3.34) than informal ones (mean 3.16); in particular, respondents were reassured about the hygienic and quality properties of damaged Parmigiano-Reggiano mostly by producers (3.88), Consortium communication (3.76) and traditional retailers (3.59), while being neutral by supermarkets (3.19), mass media (3.10) and, surprisingly, by sanitary authority (3.07). Informal sources were less appreciated by respondents, especially trust in other people working in the PR supply chain shows a neutral value (3.06), while trust in people making collective purchases has a slightly higher mean value (3.39).

The Parmigiano-Reggiano strong image and high brand awareness is implicitly recognised by respondents with a general strong agreement in the role of PDO label as a quality warranty (mean 4.35). At the same time results show that respondents' sense of belonging to the region of origin is positive (mean 3.51), whereas they are not worried or scared about the safety and frauds of Parmigiano-Reggiano because of the earthquake (mean 2.28). Parmigiano-Reggiano is generally perceived as a high quality and high priced

product; these two aspects emerged also from our survey, as it is quite generally recognised that purchasing PR-T would also lead to an economic advantage because of lower prices (3.60). This stands as a traditional economic explication, given the direct utility provided to the final consumers, and regardless of other apparent motivations.

**Table 2.** Construct items means and standard deviations, Cronbach's alpha.

	Mean	Std
<i>Behaviour</i>		
Quantity of purchased PR-T (kg)	4.41	24.00
Quantity of purchased PR-T (kg, excluding two outliers)	2.17	5.20
<i>Attitude (alpha = 0.88)</i>	4.06	0.93
Purchasing PR-T is bad/good	4.63	0.73
Purchasing PR-T is unhealthy/healthy	3.74	1.22
Purchasing PR-T is risky/safe	3.96	1.26
Purchasing PR-T is unpleasant/pleasant	4.15	1.19
Purchasing PR-T is expansive/cheap	3.86	1.18
<i>Moral Attitude (alpha = 0.80)</i>	3.95	0.97
Purchasing PR-T helps economically stricken people	3.77	1.16
Purchasing PR-T helps economically stricken industries and shops	4.15	0.96
<i>Descriptive Norm (alpha = 0.84)</i>	3.43	0.84
People important to me (parents, friends, partner, etc.) have purchased PR-T	3.54	1.27
Other people in my town have purchased PR-T	3.82	1.02
Other people in the shops have purchased PR-T	3.37	1.15
<i>Perceived Behavioural Control (PBC) (alpha = 0.80)</i>	2.57	1.16
I know shops where I can buy PR-T	2.75	1.49
I know groups of consumers that buy PR-T	2.57	1.48
I know producers that sell PR-T	2.21	1.40
<i>Intention (alpha = 0.76)</i>	3.31	1.06
I intend to purchase PR-T in the future	3.88	1.22
I am sure I'll purchase PR-T in the next weeks	2.81	1.32
<i>Formal Trust (alpha = 0.75)</i>	3.34	0.72
Trust in mass media communication	3.10	1.29
Trust in sanitary authority	3.07	1.26
Trust in Parmigiano-Reggiano Consortium	3.76	1.05
Trust in producers	3.85	1.14
Trust in traditional retailers	3.59	1.23
Trust in supermarkets	3.19	1.24
<i>Informal Trust (alpha = 0.74)</i>	3.16	1.06
Trust in other people close to me, working in the PR supply chain	3.06	1.48
Trust in other people making collective purchases	3.39	1.38
<i>Food Scare (alpha = 0.73)</i>	2.28	1.08
I was worried about the safety of PR because of the earthquake	2.10	1.15
I was worried about the frauds of PR because of the earthquake	2.42	1.30
<i>PDO Quality warranty (alpha = 0.81)</i>	4.35	0.66
PDO guarantees the origin	4.54	0.73
PDO preserves a higher quality	4.22	0.91
PDO guarantees the traditional production method	4.29	0.86
PDO protects the authenticity of the product	4.49	0.77
<i>Sense of Belonging (alpha = 0.90)</i>	3.51	0.91
I love my region	3.76	0.92
My heart belongs to my region	3.28	1.08
I feel especially attached to my region	3.55	1.02
<i>Health Status</i>		
Subjective evaluation of one's own health	4.26	0.68
<i>Wealth Status</i>		
Subjective evaluation of one's own wealth	3.36	0.87
<i>Price Advantage</i>		
Purchasing PR-T allows to buy PDO at lower prices	3.60	1.09

Source: own elaboration.

### 3.2. Profiling the consumer of the Parmigiano-Reggiano damaged by earthquake

The characteristics of consumers who have purchased the Parmigiano-Reggiano damaged by earthquake are reported in Table 3. A number of differences emerged between those who have purchased the PR-T and those who didn't buy it. TPB variables, i.e. attitude, descriptive norms, PBC and intention to purchase PR-T, score significantly higher for those who have actually purchased the Parmigiano-Reggiano damaged by earthquake. Results show that respondents who have purchased the PR-T have also a deeper sense of belonging to the region of origin, were more reassured by formal and informal communication sources and reported a lower health status than those who have not buy this product. Surprisingly, PR-T purchasers shown a slightly higher perception of frauds and safety problems in the product; this probably because respondents who didn't purchase PR-T even never think about the possible consequences of earthquake on Parmigiano-Reggiano safety and quality. This confirms the preliminary results of the focus group: respondents stated that food scare thoughts came to mind only after the purchase, and retrospectively.

**Table 3.** Mean scores differences between respondents who have purchased PR-T or not.

<i>Constructs</i>	<b>Have purchased PR-T?</b>		<b>Total</b>	<b>p value<sup>a</sup></b>
	<b>No</b>	<b>Yes</b>		
Attitude	3.87	4.26	4.06	0.004
Moral Attitude	3.86	4.04	3.95	0.200
Descriptive Norms	3.06	3.80	3.43	0.000
PBC	2.22	2.92	2.57	0.000
Intention	3.04	3.58	3.31	0.000
PDO Quality Warranty	4.27	4.44	4.35	0.069
Sense of Belonging	3.34	3.68	3.51	0.011
Formal Trust	3.17	3.52	3.34	0.001
Informal Trust	2.95	3.37	3.16	0.007
Food Scare	2.12	2.46	2.28	0.031
Health status	4.36	4.15	4.26	0.035
Wealth status	3.35	3.36	3.35	0.953
<i>Socio-demographic variables</i>				
Family size (number members)	3.36	3.17	3.27	0.321
Number of children	0.30	0.29	0.30	0.968
Age	33.91	40.50	37.17	0.001
Distance from epicentrum (km)	58.64	50.55	54.64	0.544
Gender: males	38.3%	37.0%	37.6%	0.485 <sup>b</sup>
Gender: females	61.7%	63.0%	62.4%	
Education: lower secondary	7.4%	18.5%	12.9%	0.010 <sup>b</sup>
Education: higher secondary	46.8%	54.3%	50.5%	
Education: tertiary	45.7%	27.2%	36.6%	
Born inside traditional area: No	35.1%	38.0%	36.6%	0.396 <sup>b</sup>
Born inside traditional area: Yes	64.9%	62.0%	63.4%	
Resident inside traditional area: No	18.1%	26.1%	22.0%	0.127 <sup>b</sup>
Resident inside traditional area: Yes	81.9%	73.9%	78.0%	
Damaged: Yes, serious without recover	4.3%	3.3%	3.8%	0.094 <sup>b</sup>
Damaged: Yes, serious with recover	0.0%	4.3%	2.2%	
Damaged: Yes, but not serious	8.5%	3.3%	5.9%	
Damaged: No major damages	87.2%	89.1%	88.2%	
Frequency: Less than once a week	17.0%	14.1%	15.6%	0.191 <sup>b</sup>
Frequency: At least once a week	26.6%	39.1%	32.8%	
Frequency: At least once a day	56.4%	46.7%	51.6%	

Source: own elaboration.

a: The p value indicates the significance of the ANOVA F ratio.

b: The p value indicates the Pearson's chi-squared test significance.

Consistent differences between purchasers and non-purchasers do emerge also considering the socio-demographic variables. Those who have purchased the PR-T were older (40.5 years old instead of 33.9) and

with lower formal education than those who have not purchased it. These results indicate that latent and observed variables may have influenced the behaviour under study, i.e. the quantity of PR-T purchased by the respondents.

### 3.3. Factors affecting the damaged Parmigiano-Reggiano purchase

Confirmatory factor analysis (CFA) has shown that the all items factor loadings were significant across the hypothesized theoretical framework (Table 4), and that the measurement structure is robust across the three models; this means that the latent variables keep the same meaning across the models.

**Table 4.** Factor loadings.

	Code	Model 1	Model 2	Model 3
<i>Attitude</i>				
Purchasing PR-T is bad/good	a1	0.48	0.50	0.51
Purchasing PR-T is unhealthy/healthy	a2	0.80	0.79	0.79
Purchasing PR-T is risky/safe	a3	0.89	0.90	0.90
Purchasing PR-T is unpleasant/pleasant	a4	0.87	0.87	0.88
Purchasing PR-T is expansive/cheap	a5	0.74	0.74	0.75
<i>Descriptive Norm</i>				
People important to me (parents, friends, partner, etc.) have purchased PR-T	dn1	0.74	0.73	0.74
Other people in my town have purchased PR-T	dn2	0.79	0.79	0.79
Other people in the shops have purchased PR-T	dn3	0.68	0.66	0.67
<i>Perceived Behavioural Control (PBC)</i>				
I know shops where I can buy PR-T	pbc1	0.78	0.75	0.74
I know groups of consumers that buy PR-T	pbc2	0.71	0.72	0.74
I know producers that sell PR-T	pbc3	0.75	0.77	0.78
<i>Intention</i>				
I intend to purchase PR-T in the future	int1	0.74	0.76	0.75
I am sure I'll purchase PR-T in the next weeks	int2	0.79	0.75	0.75
<i>Formal Trust</i>				
Trust in mass media communication	ft1		0.43	0.44
Trust in sanitary authority	ft2		0.30	0.30
Trust in Parmigiano-Reggiano Consortium	ft3		0.50	0.50
Trust in producers	ft4		0.79	0.78
Trust in traditional retailers	ft5		0.66	0.65
Trust in supermarkets	ft6		0.42	0.41
<i>Informal Trust</i>				
Trust in other people close to me, working in the PR supply chain	it1		0.67	0.68
Trust in other people making collective purchases	it2		0.81	0.81
<i>PDO Quality warranty</i>				
PDO guarantees the origin	pdo1		0.52	0.58
PDO preserves a higher quality	pdo2		0.67	0.69
PDO guarantees the traditional production method	pdo3		0.88	0.80
PDO protects the authenticity of the product	pdo4		0.65	0.70
<i>Food Scare</i>				
I was worried about the safety of PR because of the earthquake	fs1			0.79
I was worried about the frauds of PR because of the earthquake	fs2			0.73
<i>Sense of Belonging</i>				
I love my region	sb1			0.75
My heart belongs to my region	sb2			0.94
I feel especially attached to my region	sb3			0.91
<i>Moral Attitude</i>				
Purchasing PR-T helps economically stricken people	ma1			0.89
Purchasing PR-T helps economically stricken industries and shops	ma2			0.62

Source: own elaboration.

Note: factor loadings are all significant at 99.9% level ( $p < 0.001$ ).

The items related with factors attitude, descriptive norms, PBC and intention loaded high ( $>0.70$ , except for the item bad/good). The formal trust factor is mostly explained by trust in producers, traditional

retailers, and Parmigiano-Reggiano Consortium, while trust in sanitary authority loading is negligible (<0.40). Informal trust is highly explained by trust in other people making collective purchases. The items related with PDO Quality warranty, Food Scare and Sense of Belonging loaded generally high.

Table 5 shows the regression coefficients and the goodness-of-fit indices for the three tested models, whereas the correlations among the variables, as emerged by the analysis of Model 3, are reported in Table 6. Figures 2, 3 and 4 visually show the significant results of the three models. The goodness-of-fit indices  $\chi^2/df$ , between 1.27 and 1.67, comparative fit index (CFI) between 0.93 and 0.96, and RMSEA ranging from 0.04 to 0.06, shows that overall the hypothesized models fit the data well.

#### *Analysis predicting behavioural intentions*

Table 5 shows that the TPB variables alone are able to explain 51% of the variance of intentions to purchase PR-T in the future (Figure 2); however, the entry of additional variables in Models 2 and 3 significantly increased the amount of variance explained, up to 70% (Figure 4). PBC is the main predictor of intentions in the three models, while attitude is only significant predictor of intentions in Model 1; as long as other variables are considered, attitude doesn't remain a significant predictor. Descriptive norms are also not significant. Thus H1 is only partially confirmed. In Model 3, PBC is positively correlated with formal and informal trust, and with food scare (Table 6).

Trust in formal communication sources is significant predictor of intentions (Figure 4), while informal trust is not. This partially support H2. PDO Quality warranty is a significant predictor of intentions, thus confirming H3, and is negatively correlated with distance from epicentre (Table 6). In contrast to H4 and H5, consumers' sense of belonging to the region of origin and their moral attitude to help stricken people and companies are not significant predictors of intentions, as well as food scare.

To summarize, when consumers have a greater sense of control, i.e. know shops, groups of consumers or producers that sell PR-T, have more trust in formal communication sources in reassuring about the hygienic and quality properties of damaged Parmigiano-Reggiano, and have stronger perception about the quality warranty of PDO label, they are more likely to intend to purchase PR-T in the future. Aspects related to real-life factors and behavioural control of the external environment are expected to better predict the choices than declared values and intentions. This stands in line with recent learning from behavioural economics, whereas contingent aspects and contextual cues facilitating choices lead eventually to action. Furthermore, because trust acts like a substitute for knowledge (Hansen et al., 2003), our hypothesis that information didn't merely build trust, but that trust may activate parallel reassurance activities (community-oriented and socially established) able to mitigate fear has been partially confirmed (i.e., positively associated with intentions). In contrast, the passage from intention to behavior is not direct and clear.

#### *Analysis predicting actual behaviour (i.e., purchase of damaged Parmigiano-Reggiano)*

Descriptive norms emerged as the main significant predictor of reported behaviour in the three models. Intention is a marginally significant predictor of behaviour only after the inclusion of all variables in Model 3 (Figure 4). Perception of control is not a significant predictor of behaviour. Thus, H6 is only partially confirmed. Descriptive norms are positively correlated with PBC, formal and informal trust, ad food scare (Table 6).

**Table 5.** Regression coefficients and model fit.

	Model 1	Model 2	Model 3
Intention ( $R^2$ )	0.51	0.69	0.70
<i>Predictive variables</i>			
Attitude	0.13 *	0.04	0.03
Descriptive Norm	0.06	-0.18	-0.18
PBC	0.65 ***	0.56 ***	0.58 ***
Formal Trust		0.50 **	0.48 **
Informal Trust		-0.07	-0.13
PDO Quality warranty		0.29 **	0.28 **
Sense of Belonging			-0.06
Food Scare			-0.01
Moral Attitude			0.05
Behaviour ( $R^2$ )	0.22	0.23	0.32
<i>Predictive variables</i>			
Intention	0.10	0.11	0.23 §
Descriptive Norm	0.39 ***	0.38 ***	0.41 ***
PBC	0.04	0.04	0.04
Formal Trust		-0.04	-0.13
Informal Trust		0.06	0.05
Health status		-0.11 §	-0.06
Wealth status		-0.05	-0.06
Food Scare			-0.20 *
Sense of belonging			0.17 *
Moral Attitude			-0.08
Past behaviour			-0.15 *
Price advantage			-0.07
Age			0.18 **
Educational level			-0.11 §
Family Size			0.09
Children in household			0.01
Distance from epicentre			0.08
<i>Model fit</i>			
$\chi^2/df$	1.69	1.29	1.27
CFI	0.96	0.95	0.93
RMSEA	0.06	0.04	0.04

Source: own elaboration.

Note: \*\*\* indicate significant positive and negative relationships between variables at 99.9% level ( $p < 0.001$ ), \*\* at 95% level ( $p < 0.01$ ), \* at 95% level ( $p < 0.05$ ), § at 90% level ( $p < 0.1$ ).

In contrast to H7, trust in formal and informal communication sources are not significant predictors of behaviour. Sense of belonging has resulted in a significant positive effect on behaviour in Model 3, whereas moral attitude didn't, partially confirming H8. Sense of belonging is also negatively correlated with distance from epicentre (Table 6). Price advantage is not envisaged to be a significant predictor of behaviour, in contrast to H9. Past behaviour, that is the frequency of consumption of Parmigiano-Reggiano PDO, has a negative significant effect on behaviour in Model 3, also contrasting with H9. In support of H10, food scare has a significant negative effect on behaviour (Figure 4). Wealth status doesn't affect behaviour; self-reported health status has a marginal negative effect on behaviour in Model 2, then becomes non significant when other socio-demographics are considered (Model 3). Thus H11 is rejected. Few socio-demographic variables resulted to be predictors of behaviour, i.e. age having as expected a positive effect, and education, that has a marginal negative effect on behaviour, while other variables, that is family size, children in household and distance from epicentre, are not significant predictors. Thus, H12 is only partially supported.

Thus, consumers have purchased a larger quantity of PR-T if they were older and with lower formal education, if other people important to them did purchase PR-T, if they perceived a stronger sense of belonging to the region of origin, if they indicated stronger intentions to buy PR-T again in the future and if they were less worried about the safety and frauds of Parmigiano-Reggiano because of earthquake.

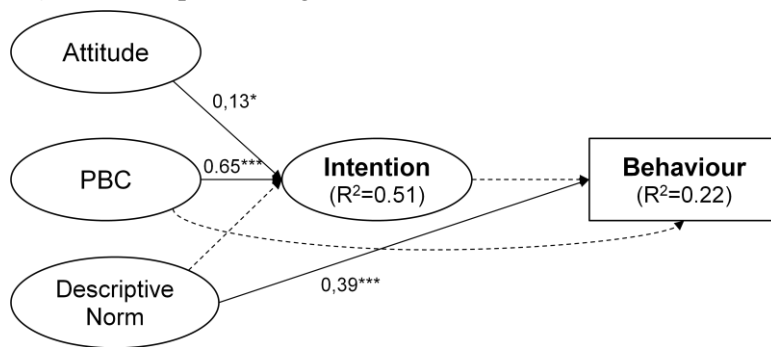


**Table 6.** Correlations between variables in Model 3, p-values.

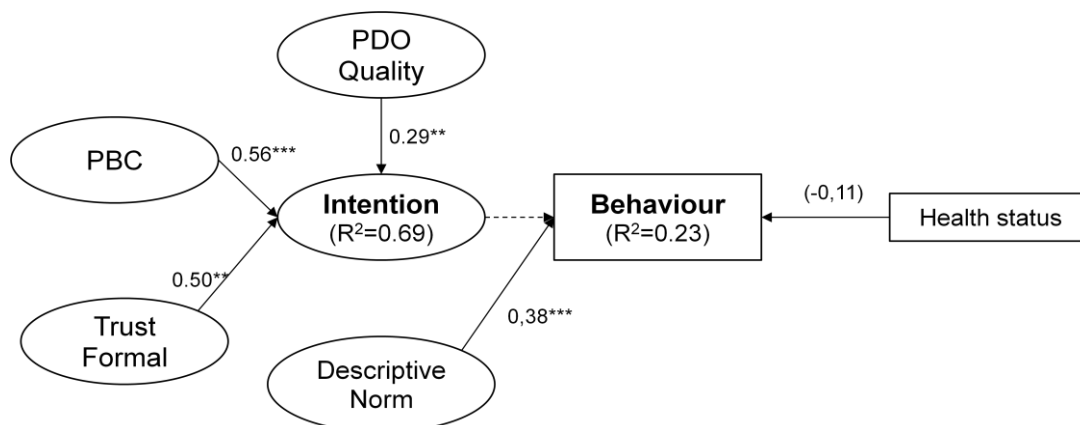
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Attitude	0.23 0.003		0.31 0.001					0.20 0.012	0.27 0.001				0.16 0.029			0.16 0.025	
2 Descriptive Norm		0.48 0.001	0.55 0.001	0.32 0.002	0.13 0.096	0.34 0.001											
3 PBC			0.36 0.001	0.48 0.001		0.46 0.001								-0.20 0.006			-0.17 0.013
4 Formal Trust				0.58 0.001	0.23 0.011	0.16 0.073		0.30 0.004	0.22 0.002								
5 Informal Trust					0.27 0.003	0.20 0.030											
6 PDO Quality warranty							0.20 0.013	0.21 0.013	0.17 0.003					0.19 0.013			-0.30 0.001
7 Food Scare							0.25 0.002										
8 Sense of Belonging												0.17 0.013					-0.19 0.006
9 Moral Attitude									0.19 0.010						0.15 0.024		
10 Price Advantage																	
11 Past behaviour															-0.16 0.017		-0.13 0.014
12 Health Status												0.27 0.001	-0.25 0.001			0.20 0.006	
13 Wealth Status																	
14 Age																-0.17 0.023	
15 Family size															0.27 0.001		-0.21 0.022
16 Children in household																	
17 Educational level																	
18 Distance from epicentre																	

Source: own elaboration.

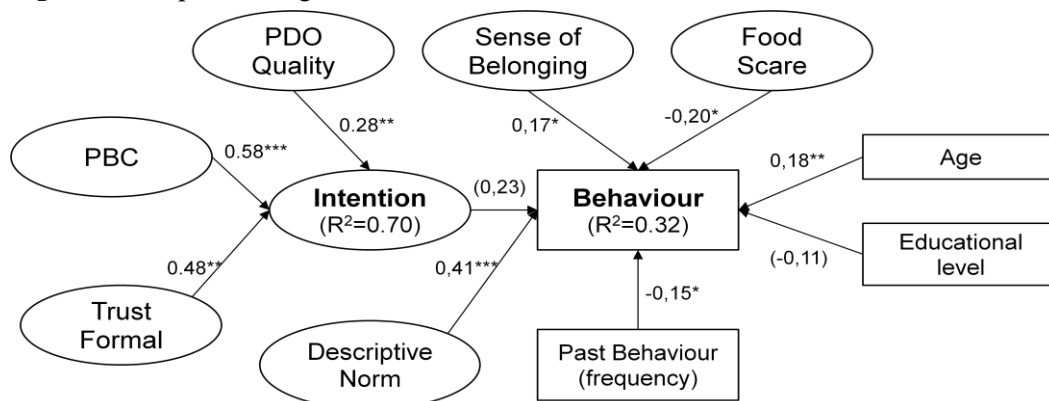
Note: correlations not shown in the table are not significant at 90% level.

**Figure 2:** Simplified diagram of Model 1 results.

Note: \*\*\* indicate significant positive and negative relationships between variables at 99.9% level ( $p < 0.001$ ), \*\* at 95% level ( $p < 0.01$ ), \* at 95% level ( $p < 0.05$ ), values between brackets indicate significant relationships at 90% level ( $p < 0.1$ ). To make it visually understandable, the diagram does not display correlations between variables and non-significant relationships between variables, relative to the full results (Table 5).

**Figure 3:** Simplified diagram of Model 2 results.

Note: \*\*\* indicate significant positive and negative relationships between variables at 99.9% level ( $p < 0.001$ ), \*\* at 95% level ( $p < 0.01$ ), \* at 95% level ( $p < 0.05$ ), values between brackets indicate significant relationships at 90% level ( $p < 0.1$ ). To make it visually understandable, the diagram does not display correlations between variables and non-significant relationships between variables, relative to the full results (Table 5).

**Figure 4:** Simplified diagram of Model 3 results.

Note: \*\*\* indicate significant positive and negative relationships between variables at 99.9% level ( $p < 0.001$ ), \*\* at 95% level ( $p < 0.01$ ), \* at 95% level ( $p < 0.05$ ), values between brackets indicate significant relationships at 90% level ( $p < 0.1$ ). To make it visually understandable, the diagram does not display correlations between variables (reported in Table 6) and non-significant relationships between variables, relative to the full results (Table 5).

#### 4. DISCUSSION AND CONCLUSIONS

The revised TPB model predictors accounted for 70% of the variance of intentions to purchase “Parmigiano-Reggiano Terremotato” (PR-T, namely “Parmigiano-Reggiano damaged by earthquake”) in the future and 32% of the variance of behaviour (i.e. actual PR-T purchase). These findings are very encouraging and consistent with the meta-analysis of previous TPB studies by Armitage and Conner (2001). The study confirmed preliminary assumption of the solidarity expressed in the aftermath of the earthquake waves in Emilia Romagna region in 2012. However, new elements emerged giving a rounder vision of the phenomenon of the run on damaged Parmigiano-Reggiano wheels.

Firstly, the role of *social networks* and *gate-keepers* in facilitating and transmitting a (desirable and expected) behaviour is once again confirmed, coherently with previous research on social marketing and food marketing (Wansink, 2005). Key people (relatives, friends, but also colleagues on the worksite) made moral pressure to contribute to collective purchases of Parmigiano-Reggiano, in the spirit of giving relief to affected producers having lost their productive sites and manufactures. This feature, well recognised inside marketing, should be considered for similar, future food crisis whereas food-scare aspects and solidarity need to match.

Similarly, the role of environmental, contextual facilities and clues allowing for a perceived behavioural control (PBC) were positively associated with intention. This is another confirmation from behavioural economics which has to be considered as a stable argument for future social marketing investigations and actions (community oriented interventions, policy making, etc.). Making easier the access to key resources (e.g., improving information, etc.) and increasing people’s capability seems a major aspect to effectively reach the intended goals.

Another relevant aspect: among the key players able to reassure trust producers, more than retailers and wholesalers-distributors, were able to capitalize equity. It may mean that in case of crisis communication, people less “marketing oriented” are perceived more trustable and genuine than professionals from marketing. Interestingly, despite one of the major argument of retailers is about “fidelity” and “trust” accorded by the end-consumers to them, dairy producers were considered as more trustworthy. In any case, trust in different communication channels was only partially and indirectly related to the final behaviour of purchasing Parmigiano-Reggiano damaged by earthquake. It seems here that social motivations took the prevalence on official sources and rational information processing as determinant of purchase.

This allows insightful reflections. In particular, despite people are motivated to comply with expectations from relatives and friends (descriptive norm), rationally they trust more formal channels. Interestingly, this is in line with the Elaboration Likelihood Model (ELM) of the information, whereas *central-route* of decision making as opposed to the *peripheral one* (Petty and Cacioppo, 1986): persons are emotionally motivated to act by relatives and friends, relying on cognitive shortcuts and simplified heuristics; but then they rationally process information under more aware pathways and following more robust and accountable sources (e.g., Health authorities, media, press, Consortium of Parmigiano-Reggiano, etc.). Eventually, the direct link between descriptive norm (compliance with social expectations) and behavior (purchase of damaged Parmigiano-Reggiano) means this was truly and ultimately a “socially driven event”, whereas emotional aspects had a positive role, coming up in a “solidarity run”.

The PDO brand seemingly deploys its task to reassure people locally more than people from the “outside”. This positive “local” bias has been addressed in food literature, whereas being a food *local* grants inferentially it a safer perception. Slovic et al. (1988) included familiarity as one of three primary factors that

affect people's risk perception. Murdoch et al. (2000) underline how the perception of “natural”, “traditional” and “local” foods” marks the revamped turn to quality food products as more able to provide safety perception. In parallel, studies on environmental pollution stress how persons perceive their territory as less polluted than the reality (Bickerstaff, 2004), and hence intrinsically safer.

Food scare perception was negatively correlated with purchase intention, as expected. However, persons having made the purchase of damaged Parmigiano-Reggiano were the most concerned about food scare aspects (hygienic conditions and storage aspects). This probably stresses that food scare was not a reason impeding purchasing PR-T, and the persons not buying probably never thought about possible consequences on Parmigiano-Reggiano safety and quality in the aftermath of the 2012 earthquake waves. As expected, other socially embedded features such as sense of belonging to the territory, that decreases with the increasing distance from epicentre, positively affects purchase of Parmigiano-Reggiano damaged by earthquake. These results are also in line with previous outcomes from the focus group: persons making PR-T purchases were firstly motivated by emotional and solidarity reasons and only after, mirroring priorities relevance, gave ground food safety concerns to emerge. This confirms complex decision-making and cognitive processes, as the multi-level risk benefit assessment (Hansen, 2003), and that rationality is not a future focused-screening to orient action, but rather an “ex post” discourse – in the vein of a “narrative” –, able to retrospectively justify actions happened. It confirms baseline assumptions of the bounded-rationality paradigm (Simon, 1957), and of “cognitive dissonance” (Festinger, 1957).

Price advantage for purchasing PR-T, although found as quite important factor for respondents, didn't result to be a significant predictor of behaviour. For this there are 2 possible explanations. Firstly, the questionnaire consisted of stated preferences. So respondents may have dismissed (masked) the role of price as frequently may happen, and given the revealed assumptions of the study (i.e., to measure aspects of solidarity, which makes morally questionable to focus on prices). Secondly, the price for Parmigiano-Reggiano cheese is expected to be rigid (due to the particular demand of high quality food products and difficult substitution). It means consumers expect to pay virtually the same price and are less prone to promotional-offer logic.

We can conclude that a number of variables contribute to explain and give shape to the solidarity dimension in its widest meaning. Formal trust guaranteed by producers, the perception of the local annexed to the PDO label, as well as the sense of belonging to the territory, the compliance to social expectations and the recognition of being useful to stricken people and producers, the role of these all addresses a social dimension, inside which the food is produced, stored, sold and more broadly, conceived. It reflects an even wider and more dense, pregnant idea of the significance of *solidarity*: including more than a concept of external relief and economic aid, the willingness of the members of community to act in the same direction, for shared values: in order to maintain prospectively the material and cultural basis of the same society, with an eye onto the past and another into the future.

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