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CONSUMERS' CONSCIOUSNESS AND WILLINGNESS TO PAY FOR FISHERY PRODUCTS WITH ECOLABELS: AN EMPIRICAL STUDY ON UNIVERSITY STUDENTS IN ITALY

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Abstract: This research concerns ecolabels in the fishery sector and its main objectives are to verify: 1) whether they are recognized and their meaning is known by culturally qualified young consumers and 2) whether it is possible to quantify these consumers' "willingness to pay" (WTP) for fish products bearing ecolabels. Literature review has shown that even though over the years many studies on Corporate Social Responsibility (CSR) labelling were carried out, only few focused exclusively on the fishery sector, analysing the young consumers' point of view. Following literature review, a questionnaire was designed. The measurement scale used in this study was adapted from scales validated in previous papers and double checked against field literature. The final part of this research investigates the sentiment of 411 students of the University of Turin (Italy), employing multivariate statistical methods. The results of this analysis point out that most of the investigated students (39.41%) on the one hand are very poorly informed about this topic but on the other hand have a medium WTP. Familiarity with ecolabels may improve consumers' sustainability awareness, enabling purchasers to make informed choices. Ecolabels can also support the sea environment avoiding overfishing and the risk of depletion of certain fish stock.

Keywords: consumer attitude, willingness to pay (WTP), ecolabels, fishery products, cluster analysis, multivariate analysis

Introduction

The understanding and consciousness of issues related to Corporate Social Responsibility (CSR), sustainability, and ethical consumption are nowadays becoming increasingly fundamental for producers' supply chains and for consumers (García-Martín *et al*., 2020). CSR and sustainability are topics which arose nearly 50 years ago and even if the origin and development of their concepts are different, they may reflect complementary aspects. Sustainability was developed after CSR, which may be considered as a way to pursue sustainability (Oliwa, 2021). Companies are therefore requested by stakeholders to attain sustainability by means and strategies related to the triple-bottom line model, which considers all businesses in the perspective of economic, environmental and social aspects (Tate *et al*., 2010; Petrescu *et al*., 2020). Furthermore, over the years many authors (Porter and Van Der Linde, 1995; Zadek, 2007; Zeng *et al*., 2010; Alos-Simo *et al*., 2020) have stated that business revenue is positively influenced by a cleaner production.

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With reference to ethical consumption, already 20 years ago some scholars (e.g. Shaw and Clarke, 1999; Follows and Jobber, 2000) stated that an ethical and sensitive consumer feels a direct link between what is consumed and the environmental/social implications of his/her consumption. Since the 1960s, per capita global fishery and aquaculture (F&A) consumption has doubled (FAO, 2018), mostly because health benefits of fish consumption were revealed (Verbeke *et al*., 2007). These products, in fact, offer more benefits than harm for a variety of health outcomes: it has been stated that every 20 grams per day (approximately one serving/week) increment «could decrease by 2%-7% the risk of coronary heart disease mortality, cardiovascular disease mortality, all-cause mortality, stroke, myocardial infarction, acute coronary syndrome, heart failure, gastrointestinal cancer, metabolic syndrome, dementia and Alzheimer's disease. Beneficial associations were also found for cancers, atopic, musculoskeletal, gastrointestinal and ophthalmologic outcomes» (Li *et al*., 2020).

F&A products also provide high quality proteins, they have a low-fat content and, at the same time, they are characterized by many micro-nutrients such as vitamins and minerals (Yaktine and Nesheim, 2007). Eating fish also depends on other factors such as i) country; ii) socio-demographic characteristics; iii) cultural traditions, which have been changing over time (Almeida *et al*., 2014); iv) marketing, communication and information provisioning (Jacobs *et al*., 2018). The above-mentioned demand growth confirms the significant and increasing role of F&A in providing healthy food for human consumption and in the rapid development of their international trade. Fish and fish products are nowadays among the most merchandised commodities in the world (totally estimated USD 145 billion in 2017) and fisheries have to be properly managed to avoid overfishing (Verbeke *et al*., 2007), which is considered biologically unsustainable. (FAO, 2020). Maxwell *et al*. (2015) provide an interesting definition of "dynamic ocean management" which implies a sustainable approach: this management fluctuates in space and time and acts upon the instable «nature of the ocean and its users», built «on the integration of new biological, oceanographic, social and/or economic data in near real-time». The last report edited by FAO (2020) on "The State of World F&A" reveals that «total fish production (excluding aquatic plants) is expected to expand from 179 million tonnes in 2018 to 204 million tonnes in 2030». This production, in per capita terms, reveals that world fish consumption is projected to touch kg 21.5 in 2030, up from kg 20.5 in 2018. According to Assoittica Italia (Associazione Nazionale delle Aziende Ittiche - Italian National Association of Fish Farms), fishery products represent an important portion of the annual diet intake: Italians consume about kg 28 a year per capita, the highest level of consumption in the European Union (EU). (ANSA, 2018). In the past, consumers were incapable to make conscious choices related to F&A products, as it was quite difficult to recognize whence the fish originated, how it was caught (Jaffry *et al*., 2004) or the production methods. In order to enable consumers to enjoy safe use of food and to make informed choices, Regulation (EU) n° 1169/2011 on the provision of Food Information to Consumers (FIC) and Regulation (EU) n° 1379/2013 on the Common Organization of the Markets in F&A products (CMO) have provided accurate and wide-ranging rules on, inter alia, the method of production and the origin of products. These provisions shall be indicated in labelling. The general objective of FIC is to accomplish free movement of legally produced and marketed food in the EU and, at the same time, a high level of consumer health protection. CMO, without prejudice to FIC, establishes that F&A products listed in points (a), (b), (c) and (e) of Annex I (in short, all unprocessed and some processed products – e.g. salted, smoked products, cooked shrimps in their shells) which are marketed within the EU, regardless of their origin or their marketing method, may be offered for sale to the final consumer or to a large retailer only if appropriate marking or labelling includes the required indications. Article

35 of the CMO Regulation specifies how the production method, the catch area/farmed area and the category of fishing gear may be indicated in prepacked and non-prepacked F&A products. The production method, for example, must be displayed using the following designations: "caught ..."; or "caught in freshwater ..."; or "farmed ...". Mixed products of the same species and different production methods must display the method of production for each batch. According to the FIC regulation, food business operators may provide food information even voluntarily but, in any case, the latter shall not misinform the purchaser, shall not be ambiguous or confusing and, where appropriate, shall be founded on relevant scientific records. Voluntary food information shall not be shown to the detriment of the space available for mandatory food information.

Nowadays, ecolabels have become very widespread for a wide range of products and, at international level, up to 455 voluntary ecolabel schemes can be found in the markets of 199 countries, referring to 25 food and non-food industry sectors (Ecolabel Index, 2021). Such a high number of ecolabels can trigger the effect that consumers do not understand and perceive them (Taufique *et al*., 2019) and, therefore, that they are not conscious of their differences (Carrero and Valor, 2012; Eldesouky *et al*., 2020). If this happens, it is very difficult and sometimes impossible for them to make aware choices (OECD, 2009, D'Souza *et al*., 2007, Annunziata *et al*., 2011). It has to be said that some of these labels can also look similar (Ecolabel and ISO 14001) even if the standard is very different (Fliess *et al*., 2007). However, if consumers have the capability to distinguish these ecolabels from and among the others and to understand their correct meaning, they can be driven towards sustainable products (Asioli *et al*., 2020) even if this decision is obviously induced also by other drivers such as familiarity, price of the product and willingness to pay for it as a percentage of the base price (WTP), promotion, traceability (Katt and Meixner, 2020), packaging and brand (Grunert and Aachmann, 2016; Schäufele and Hamm, 2017). With reference to the above mentioned 455 voluntary ecolabels, only 6 are related to the fishery sector and just 3 are found in the Italian market (Table 1).

Table 1: Ecolabels for fishery products: logo and countries where they can be found

Logo	Countries
Dolphin safe / Dolphin friendly	American Samoa, Argentina, Australia, Austria, Belgium, Brazil, Canada, Colombia, Costa Rica, Ecuador, Egypt, France, Germany, Indonesia, Ireland, Israel, Italy, Japan, Liechtenstein, Luxembourg, Maldives, Mauritania, Mauritius, Monaco, Netherlands, Nicaragua, Norway, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russian Federation, Samoa, Seychelles, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, United States, United States Minor Outlying Islands, Venezuela.
Friend of the Sea	Germany, Italy, Spain, Switzerland, United Kingdom.

Marine Stewardship Council	Argentina, Australia, Austria, Bahrain, Belarus, Belgium, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Ghana, Greece, Hungary, Ireland, Italy, Japan, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Malaysia, Malta, Mauritius, Moldova (Republic of), Namibia, Netherlands, New Zealand, Norway, Paraguay, Poland, Portugal, Qatar, Romania, Russian Federation, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Spain, Suriname, Sweden, Switzerland, Taiwan, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States, Uruguay, Venezuela, Vietnam.
Naturland e.V.	Germany, Mexico, Sri Lanka.
Salmon-Safe	United States.
SeaChoice	Canada.

Source: Adapted by the authors from Ecolabelindex (2021).

This study analyses only ecolabels available in the Italian market. These labels may be found by consumers on very popular fish products such as, for example, tuna, cod and salmon. The prices of these products are obviously related to various aspects such as type of fish, net quantity of the food, brand, sort of packaging, kind and amount of liquid medium in which eventually the solid food is presented, distribution channel, special offers etc. Just to give an idea of the price, Table 2 shows the different prices of 80 grams and 160 grams cans of tuna (with and without the Dolphin Safe/Dolphin Friendly logo) sold at a very popular supermarket in Turin, which trades also on line (prices on line are the same as those in the supermarket). Products on special offer have not been considered.

Table 2: prices of cans of tuna with and without the Dolphin Safe/Dolphin Friendly logo (the items are presented by rising prices per kind of liquid medium)

Brand	Tuna in … liquid medium	N° cansxg	Drained weight grams total amount (N° cansxg)	Price euro/kg	
Brand 2	In olive oil	3x80g	g 156 (3x52g)	9.63	No
Private label	In olive oil	4x80g	g 208 (4x52g)	10.91	No
Brand 1	In olive oil	4x80g	g 208 (4x52g)	17.47	Yes

Brand 5	In brine	3x80g	g 158 (3x56g)	10.78	Yes
Private label	In brine	3x80g	g 168 (3x56g)	15.42	No
Brand 3	In brine	4x80g	g 224 (4x56g)	17.80	Yes
Brand 2	In extra virgin olive oil	4x80g	g 208 (4x52g)	18.44	No
Brand 1	In extra virgin olive oil	4x80g	g 208 (4x52g)	21.67	Yes
Brand 4	In extra virgin olive oil	2x80g	g 104 (2x52g)	31.14	Yes
Private label	In olive oil	4x160g	g 416 (4x104)	10.93	No
Brand 1	In olive oil	2x160g	g 208 (2x104g)	17.16	Yes
Brand 5	In olive oil	3x160g	g 312 (3x104g)	21.70	Yes

Source: Esselunga a casa (2021).

The price for this kind of fish product, at the considered supermarket, is between 9.63 euro/kilo (3 cans of 80 grams of tuna in olive oil without the ecolabel logo) and 31.14 euro/kilo (2 cans of 80 grams of tuna in extra virgin olive oil with the Dolphin Safe logo). Further consideration about the data provided in this table will be presented in the discussion and conclusions section.

In Italy, 0.3 million tonnes of fish (including molluscs and crustaceans) were produced in 2018, with a corresponding value of USD 1658.4 million. 68% of this value come from fisheries (that is, capture of wild resources) and 32% from aquaculture. Italy is a net importer of fish and fish products. Between 2008 and 2018, the quantity produced decreased by 10%, while its value decreased by 15%. Exports decreased by a total of 1%, while imports increased by 16% (OECD, 2021). As stated above (ANSA, 2018), Italians consume about kg 28 of fish per capita a year; 28 percent of respondents taking part in a recent survey (Ipsos, 2019) stated that it is very important to them that the fish they consume is not on a list of species at risk of disappearing. Just over half of the participants said this was somewhat important to them.

This study was carried out in the above-mentioned Italian context. It aims at presenting the second part of an empirical study on ecolabels in the fishery sector, carried out at the University of Turin (Italy), among University students (the first part of the research is at present in press, Varese *et al*., 2022).

Literature review

CSR labels declare that a product has achieved or is about to attain a certain level of social or environmental performance. Thanks to these labels, credence attributes which are impossible to evaluate before consumption are turned into search ones, which can be assessed prior to purchase (Carrero and Valor, 2012). It is possible to classify CSR labels into three main groups. The first one may relate to a wide variety of aspects, e.g. specific products such as seafood (Jaffry *et al*., 2004; Honkanen and Young, 2015), meat (Van Loo *et al*., 2014), coffee (Van Loo *et al*., 2015; Vlaeminck *et al*., 2016), and wine (Schäufele and Hamm, 2017); geographic indication and organic production (Zander *et al*., 2015; Drexler *et al*., 2017; Bazzani *et al*., 2017); social responsibility labels, e.g. fair trade (Panico *et al*., 2014); animal well-being (Honkanen and Ottar Olsen, 2009; Velarde *et al*., 2015; Grunert *et al*., 2018); and climate friendly food consumption (Feucht and Zander, 2018; Leach *et al*., 2016). In brief, according to Hartlieb and Jones (2009), following the topic criterion, CSR labels may

be classified as "planet" (environmental), "people" (social justice) or "animals" (animal well-being). The second group consists in three different types of voluntary environmental labels, identified by the International Organisation for Standardization (ISO). Type I labels are centred on a pass-fail multicriteria approach designed to indicate the overall environmental performance of a product which will not be eligible for the label if even one of the criteria is not satisfied (e.g. eco-labels which are third-party verified). Type II labels are self-declared, generally communicated by means of a claim (e.g. "made from x% recycled material") made by business operators who state the environmental quality of their goods. These labels appear in a written and/or figurative (symbolic) form and are not verified by a third party. These declarations should not be ambiguous, misleading or vague, and should be demonstrable. Type III labels include a variety of information on different aspects of the product supply chain; they are performance-based, and they are verified by a third party (e.g. Fairtrade International) (D'Souza *et al*., 2007; Carrero and Valor, 2012). Finally, the third group refers to the awarding competent body, e.g. self-declared labels, industry body, non-governmental organization (Zadek *et al*., 1998), public authorities and multi-stakeholder organisations. Scholars have analysed all or some of the above-mentioned CSR labels one by one or jointly (D'Souza *et al*., 2006; Annunziata and Scarpato, 2014; Grunert *et al*., 2014; Sidali *et al*., 2016; Hoek *et al*., 2017; Asioli *et al*., 2017).

Sustainable management may require consumers to be willing to pay a premium price for products bearing CSR attributes (for the fishery sector see: Smith *et al*., 2010). When this occurs, some authors claim that consumers are not ready to spend more money for these products (Padel and Foster, 2005; Vermeir and Verbeke, 2006; Grunert *et al*., 2014; Vlaeminck *et al*., 2016), while others underline the willingness of consumers to pay a premium price (Laroche *et al*., 2001; Loureiro and Lotale, 2005; Sammer and Wüstenhagen, 2006; D'Souza *et al*., 2007; Kotler, 2011; Tully *et al*., 2014). Focusing on the fishery sector, over the years, some scholars (Teisl *et al*., 2002; Roheim *et al*., 2007; Roheim *et al*., 2011; Asche and Guillen, 2012; Hammarlund, 2015) have concentrated their research on fishery attributes (e.g. green sustainability, country of origin, fishing gear option, and fishing technique).

This empirical study aims at verifying whether the above-mentioned Italian fishery ecolabels are recognized and their meaning is known by culturally qualified young consumers. Its goal is also to ascertain whether it is possible to quantify these consumers' WTP for fish products bearing these attributes.

To the authors' evidence, researches which investigate the attitudes of young consumers towards ecolabels are limited (Vermeir and Verbeke, 2008; Mäkiniemi *et al*., 2011; Lee, 2014; Li *et al*., 2015; Savelli *et al*., 2017; Sidiropoulos, 2018; Bollani *et al*., 2017; Bollani *et al*., 2018) and a few have studied only fishery ecolabels (e.g., Varese *et al*., 2022 in press). The authors also presume that this research will contribute to filling a gap in literature because, beside investigating the perception by young people, it explores the WTP for fishery products characterised by ecolabels. Companies will be confronted with CSR strategies more and more, and since University students will be the consumers of the future, the information inferable from this study can be useful for them.

Aims of the study

As stated above, the objective of this study is to test the comprehension of fishery ecolabels by University students and to verify the possibility of quantifying their WTP as a percentage of the base

price for food products bearing the related ecolabels. With reference to the classification of CSR labels proposed in the literature review, the selected fishery ecolabels deal with specific products (fish) and refer to animal well-being and environmental protection. They belong to Type III ISO classification and are acknowledged by international organisations.

The meaning of these 3 logos and the differences among them are briefly described hereafter. Dolphin safe/Dolphin friendly (black and white logo) is awarded by the Earth Island Institute which monitors tuna companies worldwide to ensure tuna fish are caught without any dolphin mortality and by protecting the marine ecosystem. Friend of the Sea (red, blue and white logo) aims to improve the global sustainability of seafood by developing international certification schemes for sustainable fisheries and aquaculture products. The Marine Stewardship Council (blue-and-white logo) is a mark that sets standards for sustainable fishing, certifying that fisheries minimise their impacts on the whole marine environment in order to ensure healthy, thriving oceans for the future.

This research investigates University students because they present similar characteristics (a high school diploma and the same age bracket), and as they have probably attended commodity science, social science, and/or economics classes they may have some awareness of the concept of sustainability, which is a key aspect for the aim of this research. According to Vermeir and Verbeke (2008), young people attending University are in a crucial step of the development of their personal identity, which also includes beliefs and values. If sustainability is a relevant concept for them, they will probably take this consciousness into their older age and therefore they will encourage policy makers to improve food consumption habits within the population.

In order to pursuit the aim of this study, two research questions were asked:

Q1) Are University culturally qualified students conscious of the meaning of ecolabels related to the fishery sector?

Q2) Is it possible to quantify their WTP for fishery products with QMs?

In order to answer these questions, first of all an in-depth literature analysis on ecolabels was performed. Thereafter, an anonymous questionnaire was structured, also taking into consideration previous relevant research emerged from the literature analysis (D'Souza *et al*., 2006; Grunert *et al*., 2014; Sidali *et al*., 2016; Hoek *et al*., 2017; Cerri *et al*., 2018). The study investigated both Bachelor and Master students, and considered three fishery ecolabels: Dolphin Safe; Friend of the Sea; and Marine Stewardship Council (Table 1). These ecolabels were drawn from the Ecolabel Index directory, considering only the ones available in the Italian market.

In order to check the validity of the questionnaire, so as to discover any imprecision and any structural limitation (Clonan *et al*., 2010; Vecchio and Annunziata, 2013), a preliminary version of the survey was submitted to about 20 students of the University of Turin. After a few amendments, a definitive version was defined and submitted through "Computer-assisted personal interviewing" (CAPI); a trained interviewer was always available to help and guide respondents. The three above mentioned ecolabels were verified for knowledge ("Have you ever seen these ecolabels?") and respondents were asked to rate their familiarity with each ecolabel on a 7-point Likert scale (Likert, 1932) with endpoints 1="Never" and 7="Always".

Statistical methods

Multivariate statistical techniques were used to investigate the responses. As they can be traced back to both quantitative (Likert scales) and qualitative variables, two different techniques were used to reduce dimensionality and explore the relationships among them. Principal Component Analysis (PCA) was employed to summarize the responses proposed in the Likert scales, and Multiple Correspondence Analysis (MCA) to show the relationships among qualitative variables. Moreover, Hierarchical Cluster Analysis (HCA) was used to group respondents; it was computed using the main PCA or MCA dimensions as inputs, and for this aim a PCA-HCA process or a MCA-HCA process were used.

In particular, a first synthesis of quantitative variables was carried out through the PCA-HCA process, dividing respondents into levels of a new qualitative variable; it was then added to the other qualitative variables available in the questionnaire to produce the input of an MCA-HCA process. Finally, the groups of respondents, thus constituted using all information conveyed by the responses, became the object of study regarding their opinions and behaviours.

R software, FactoMineR (Escofier and Pagès, 2005) and CA (Greenacre, 2007) packages were used for the analyses.

Results

The results refer to 411 persons who are 59.37% male and 40.63% female. As to age, they are divided into the following groups: 18-20 (65.69%), 21-23 (28.95%), and >23 years-old (5.35%).

A preliminary synthesis of the variables expressed in Likert scales, through the PCA-HCA process, produced the qualitative variable named "Environmental and economic features" in Table 3. Its levels are identified in the following clusters: the first cluster (24.82% of the sample) considers brand very important, but has low confidence in the seller; the second one (22%) judges both confidence in the seller and information acquired through labels very significant, and on the other hand gives low importance to product safety and to ethical and social aspects; the third and final cluster (52.80%) gives average importance to ethical and social aspects, but low significance to brand and information acquired through labels.

Table 3 shows the complete set of qualitative variables used in this research and considered in the MCA analysis.

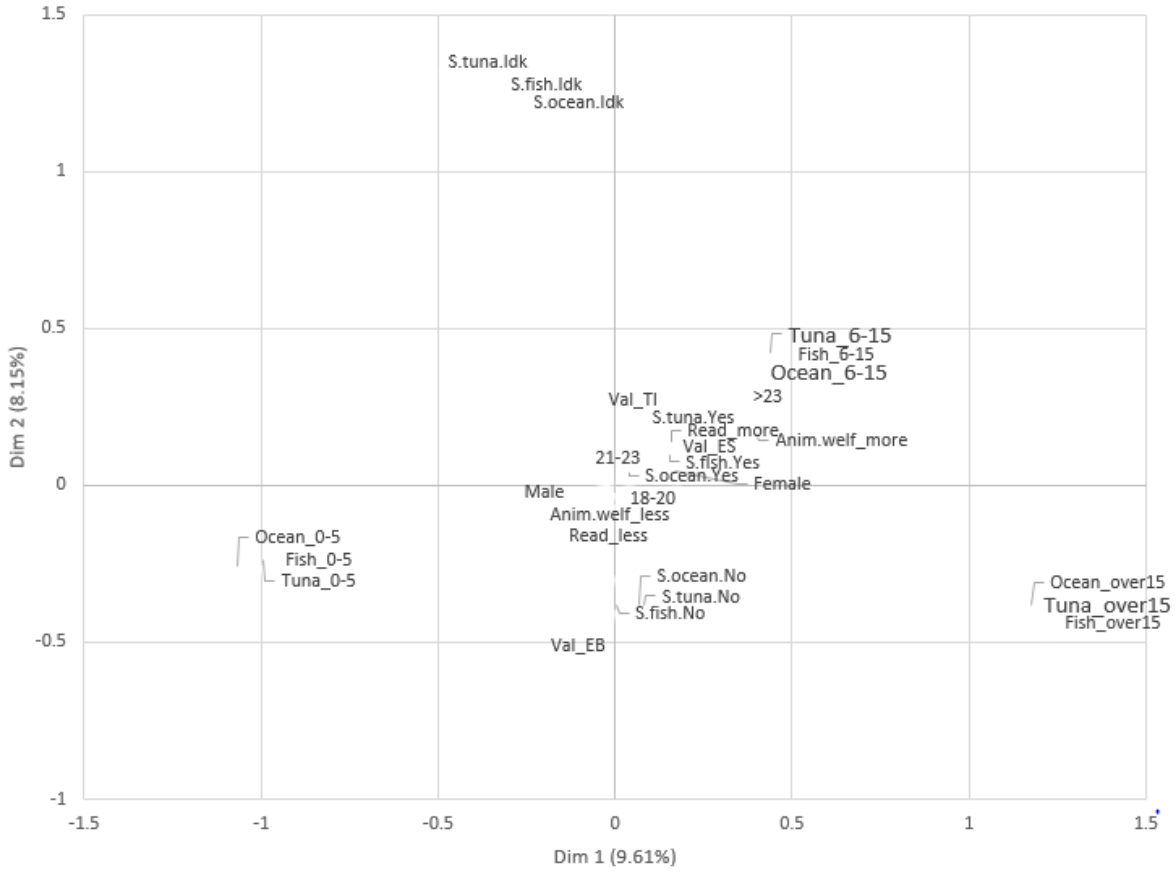
Table 3: Variables and items considered in multivariate analyses

Variables	Items	Descriptions
Cruelty free information check	Anim.welf_more	Attention to animal welfare
	Anim.welf_less	Indifference to animal welfare
Label reading frequency	Read_more	High label reading frequency
	Read_less	Low label reading frequency
Sustainable fishery symbol	S.fish.Yes	Symbol recognized as seen
	S.fish.No	Symbol recognized as not seen

	S.fish.Idk	Symbol not remembered
Sustainable tuna fishing symbol	S.tuna.Yes	Symbol recognized as seen
	S.tuna.No	Symbol recognized as not seen
	S.tuna.Idk	Symbol not remembered
Ocean protection symbol	S.ocean.Yes	Symbol recognized as seen
	S.ocean.No	Symbol recognized as not seen
	S.ocean.Idk	Symbol not remembered
Willingness to pay (WTP) - Fish	Fish_0-5	From 0 to 5% more
	Fish_6-15	From 6 to 15% more
	Fish_over15	Over 15% more
Willingness to pay (WTP) - Tuna	Tuna_0-5	From 0 to 5% more
	Tuna_6-15	From 6 to 15% more
	Tuna_over15	Over 15% more
Willingness to pay (WTP) - Ocean	Ocean_0-5	From 0 to 5% more
	Ocean_6-15	From 6 to 15% more
	Ocean_over15	Over 15% more
Environmental and economic features	Val_ES	High value given to ethics and safety
	Val_EB	High value given to ethics and brand
	Val_TI	High value given to trust and information
Gender	Female	Female
	Male	Male
Age	18-20	18-20
	21-23	21-23
	>23	>23

Graph 1 represents the output of the MCA.

As can be perceived from Graph 1, the upper part of the map shows – far from the others – the respondents who do not remember to have seen the symbols considered in the analysis, but even those who do not know the correct meaning associated with QMs. Following the first dimension, starting from the left side, low WTP levels (0-5% more) can be found for the presence of each symbol printed on the label; moving to the right side of the graph, a medium WTP can be observed (6-15% more) for all QMs; and the elements on the far-right side mark a high WTP (>15%). Following the second dimension, the respondents collected in the group sensitive to ethics and brand importance (Val_EB) are placed at the bottom of the chart. Moving from the bottom up, the group sensitive to ethics and safety (Val_ES) can be found first, while the group sensitive to trust and information (Val_TI) is shown higher in the graph. On the same path, those who did not recognize the three assessed QMs (any of them) are placed in the lower part of the chart, while those who recognized them are positioned higher in the graph. Female respondents are placed more to the right/top side of the graph, due to their greater WTP for the presence of each symbol printed on the label (right side) and to a greater ability in recognizing QMs and confidence in the seller (higher, on the side). In the same way, those who read more information on labels and those who are more sensitive to animal welfare are placed in a far-right and higher region. As far as respondents' age is concerned, 21-23 and 18-20-year-olds show similar behaviour, while the smaller share of >23 years olds seems to be slightly more focused on sustainable practices.

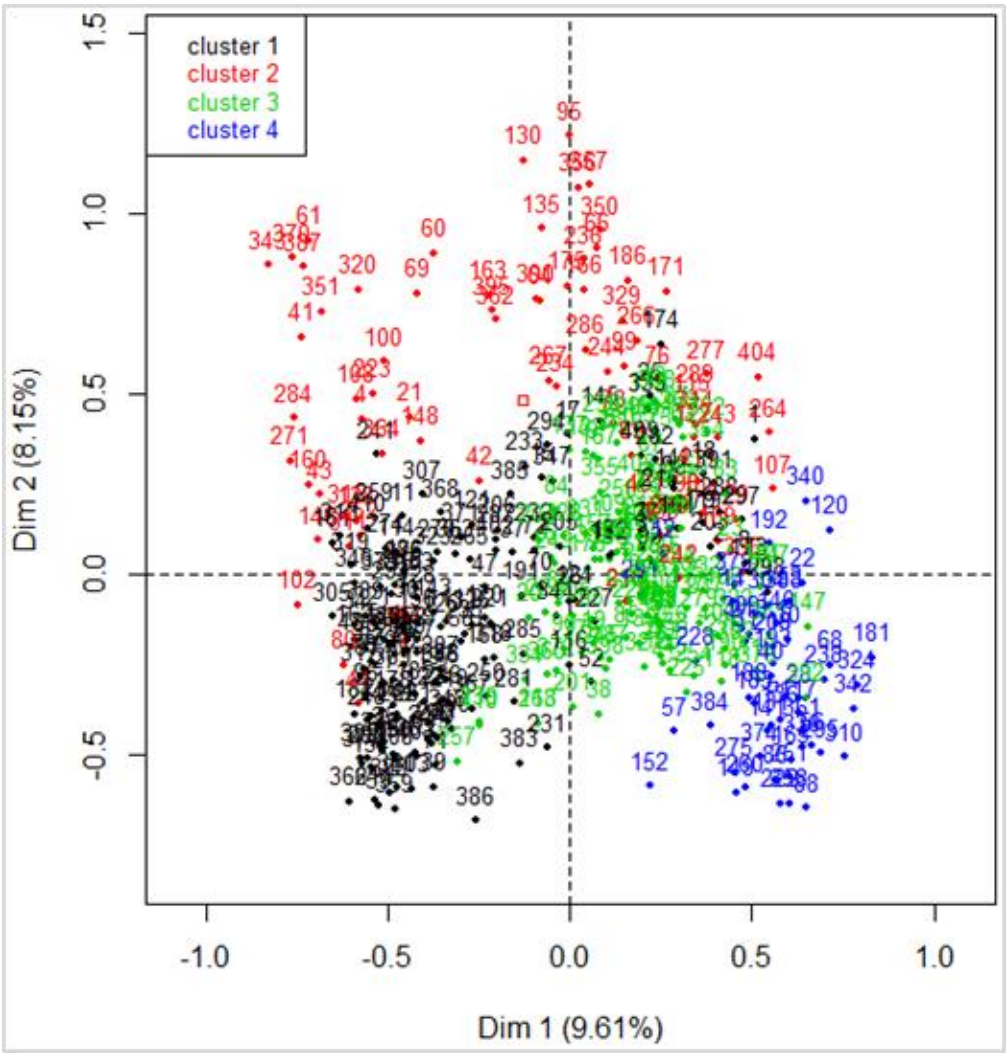


Graph 1: Relationships among all the items considered (MCA)

N.B. By applying Greenacre's re-evaluation (2007) of the inertia referred to the first two dimensions in both Graphs 1 and 2 (in consideration of the artificial inflation of the inertia produced by the MCA coding scheme), 27.64% was obtained for the first dimension and 15.70% for the second.

Finally, HCA was performed, based on the main dimensions of the MCA, obtaining four clusters of University students which are represented in Graph 2.

The first cluster (including 18.73% of respondents) is characterized by a very low WTP (0-5%): it groups male respondents – more than in other cases – who are not interested in reading and checking product labels. The second cluster (39.41%) stands out because it is very uninformed about all questions asked throughout the questionnaire; it consists in 21-23 and >23 years old respondents – older than in the other cases – and it is characterized by a medium WTP (6-15%). The students of the third cluster (12.40%) show a medium tendency regarding their WTP, and they do not recognise QMs. The remaining respondents on the left side of the graph (29.44%) have a greater WTP than the others (more than 15%) and they are very interested in ocean protection.



Graph 2: Cluster of individuals with respect to the characteristics obtained through the MCA

Discussion and Conclusions

According to Thilsted *et al*. (2016) the fish intake has increased in the last decades but the recommended per-capita fish is not generally reached. It has been demonstrated (FAO, 2021) that fish consumption offers human beings unique health and nutritional benefits (high value proteins, source of micronutrients and long chain omega-3 fatty acids) and fish and fishery products are considered key elements in a healthy diet.

CSR plans and policies which involve ecolabels have been implemented over the years by many companies worldwide because there is a very high demand for them from both consumers and markets (Carrero and Valor, 2012).

Even if the above-mentioned fishery ecolabels have been chosen by a wide range of fisheries, it has to be pointed out that some critical aspects regarding these certifications can be identified. These limits are basically due to the cost of the certification which allows fisheries to display the ecolabel and therefore to assure consumers of the respect of the specific standard. These costs can therefore be

difficult to bear by smaller fisheries which would thus not be able to apply for such certification schemes (Hadjimichael and Hegland, 2016). Furthermore, according to Mori Junior *et al*. (2016), in some countries the absence of such certifications also acts as a trade barrier. Another constraint of these three fishery ecolabels is related to the elements taken into consideration for achieving the certification, which, in the absence of an appropriate regulation on ethical concerns on the production side, may contribute to a risk of unethical behaviour by food manufacturers (Del Giudice *et al*., 2018).

It is in this context that this research has been carried out, in order to answer the two research questions concerned with 1) how University students perceive fishery ecolabels and 2) the percentage of their WTP.

Authors are aware that the chosen sample is a culturally qualified one and does not represent all young consumers, but they have decided that for the aim of this research it seems crucial to consider young people who may have some knowledge of the notion of sustainability. Young people who do not attend University may have learnt CSR and sustainability issues from outside the classroom as well; however, in order to verify their level of knowledge, authors should have made a previous screening to certify their awareness of these topics before submitting the questionnaire. University students, on the other hand, should have this knowledge.

Even if the examined sample focuses on young students, authors believe that this does not interfere with their possibility to purchase products with ecolabels because, as shown in Table 2, the prices of a can of tuna are sometimes very similar for products with or without ecolabel. It may even happen that a branded can of tuna in brine with CSR ecolabel is cheaper (Brand 5, euro/kg 10.78) than a private label one without the CSR logo (Private label, euro/kg 15.42).

The sustainability concept is generally recognised by consumers as relevant, but they do not always have the appropriate skills to recognise the implications and value of ecolabels and, even if they may be able to perceive the meaning of the sign, they may not have the WTP for it.

The results of this research identify four categories of respondents. The first one (including 18.73% of respondents) is characterized by a very low WTP (0-5%); it groups male respondents, who are not interested in reading and checking the presence of ecolabels. The second one (39.41%) stands out because it is very uninformed: it mainly consists in 21-23 and >23-year-olds and it is characterized by a medium WTP (6-15%). The third category (12.40%) shows a medium tendency regarding WTP, without recognition of ecolabels. The last category (29.44%) is willing to pay more than the others (over 15% more) and is very interested in ocean protection. The findings of a recent paper published by Maesano *et al*. (2020) confirm the positive trend above mentioned in this research, as overall consumers have demonstrated a confident perception about sustainable fish products and show a WTP a premium price for sustainability aspects.

Since most of the investigated students (39.41%) are on the one hand very poorly informed about this topic, but on the other hand have a medium WTP, these findings may encourage all fishery stakeholders to stimulate young consumers with better information and promotion of these ecolabels, so as to increase consumers' sustainability consciousness for greater awareness in purchases.

Future studies including aquaculture ecolabels, focusing on university students also from other Italian and European Universities and only on consumers eating fish (wild or farmed) seem necessary.

Declaration of Interest Statement

The authors declare that they have no conflicts of interests.

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