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Strategic Communication and Neuromarketing in the Fisheries Sector: Generating Ideas From the Territory

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Background: Globalization and technological progress has changed the relationships among fisheries, society and markets. The industrial primacy has led, among others, to the marginalization of fishermen and the deletion of local culture. It followed a loss of the conventional link between territory and traditions, with a change in consumer behavior.

Aim: The purpose of this study is to investigate the way through which the communication of territoriality of fish products influences the consumers' quality perception, their willingness to pay and the exploration of packaging, in the Italian context.

Method: In order to obtain quantitative and qualitative data on visual paths (the series of fixations and saccades) and areas of interest (AOI) of the analyzed packaging, gaze data were recorded. AOI permits to define regions of a visual stimulus and to link eye-movement measures to parts of the used stimulus. This study used AOI in order to measure Spent Time (the amount of time that consumers have spent looking at a particular AOI) and Entry Time (the time passed from the moment of the first fixation in a particular AOI) on brands and on products.

Results: The results of the drivers identified crucial points for the future communication of fish products and the promotion of the territory. In particular, the analysis lays the foundations for a reorganization of the approach to the creation of product packaging, through greater attention to detail and the intrinsic values that this can express.

Conclusion: The use of neuromarketing techniques has proved to be valid in identifying what is the main information that is processed for the evaluation of the product also considering the role played by emotions.

Keywords: neuromarketing, territory, fisheries sector, packaging, communication/eye tracker

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INTRODUCTION

Globalization and technological progress have changed the relationships among agriculture, fisheries, society and markets. The industrial primacy of consumption styles, supported by advertising, has led to the marginalization of farmer-fishermen, the loss of agricultural and maritime biodiversity, the deletion of history/memory/culture, and the belief that food is produced

in factories. It followed a food homologation and the loss of the conventional link between territory and traditions, with a change in consumer behavior (Philippidis and Sanjuán, 2003).

On the one side, consumers appreciate sobriety and social values both in consumption and communication, giving up the sensorial over excitation, typical of the period preceding the crisis. On the other side, organizations moved from profit-oriented to profit/social-value-oriented strategies: as a matter of fact, the corporate social responsibility has been transformed into a constituent value of the organizational culture, from a tool for the construction of its Corporate Image to the essence of its Organizational Identity (Dahlsrud, 2008). One of the main elements depicting this change and renewed identity is the regional marketing, which is linked to the country image and its development contributes to the regional economic progress (Bagautdinova et al., 2012).

Generally, the marketing literature has focused on the concept of authenticity, considered as one of the main drivers in the consumers' attitude toward brands and products (Holt, 2002; Napoli et al., 2014). The concept of authenticity is closely related to the origin of products (Tregear et al., 1998; Philippidis and Sanjuán, 2006), so that emphasizing the regional origin of food is becoming an alternative marketing model to the traditional one that focuses on homogeneous production and mass consumption (Domański and Bryła, 2013; Bryła, 2015). Indeed, the sense of tradition and authenticity conveyed by any reference to the region of origin are considered effective drivers to purchase (Bell and Valentine, 1997; Cacciolatti et al., 2015).

In this view, the use of tradition is growing in marketing: it refers to the consumers' need to trust and to have a point of reference; moreover, it overcomes manufacturing and relates to the regional characteristics building products image and perception on tradition and localization (Bryła, 2015). Therefore, it is important to understand those characteristics supporting the solidity of products. Territoriality is suggested to be the most appropriate characteristic due to the cultural relation between food and context and it can be applied to regional and local contexts (Sonnino, 2007). In this view, the territorial issue can be considered itself a potential product, since territories become an element of competition attracting consumers (Anholt, 2007).

Specifically, the packaging and labels are two essential instruments of the marketing strategy that can be applied to the communication of territoriality and tradition. In fact, both ensure that consumers have the essential information to make an informed food choice; moreover, they are touch points, that is moments of contact between company and consumers influencing their experiences and perceptions (De Oliveira et al., 2015).

A constantly growing interest in the fields of label, packaging and consumer neuromarketing has been occurring in recent years. With reference to these consumer studies, it is essential to note that in the last few decades, an overcoming of the traditional model based on the *homo economicus*, due to the extension of the concept of "unconscious" to the economy, has been occurring (Plassmann et al., 2007). In fact, the current complexity of the food market requires a marketing approach integrating traditional and neuroscience techniques. Traditional techniques are based on a rationalistic consumer conception model and are limited to collecting information mediated by the cognitive filter. Whereas, the neuroscientific approach makes possible to grasp the complexity of consumer's decision-making and attentive processes measuring implicit and emotional responses to marketing messages (Damasio, 2000).

Therefore, the use of the neuromarketing techniques would allow a better understanding of this complex phenomenon since it detects the underlying cognitive and affective processes. In fact, neuromarketing adapts neuroscientific models and theories to the marketing objectives, integrating behavioral models deriving from the consumer psychology (Plassmann et al., 2012). The main research areas of this discipline are the perceptive and cognitive consumers' processes; it investigates neural correlates of human behavior related, among others, to consumption attitude, emotion and behavior. Through this interdisciplinary approach, it is possible to obtain more detailed information on cortical processes that occur during the consumer's exposition to marketing stimuli (Martinez, 2011). Neurophysiological and biological processes, which are responsible for consumer decision making and behavior, can thus be investigated and provide more accurate information underlying consumer preferences, values and emotions (Meyerding and Mehlhose, 2020). This is especially true for the hidden processes that are difficult to investigate because they are below the level of consumer awareness or difficult to verbalize (Plassmann et al., 2012).

The importance of using these innovative techniques, even together with those of traditional marketing research, lies in directly detecting the involuntary activities of consumers, thus permitting researchers to elude a relevant obstacle: the cognitive dimension that predominates in responses to marketing stimuli.

One of the most used instruments is the eye tracker, which precisely tracks the location and duration of visual attention. The overabundance of images and sensory stimuli makes the eye tracking an effective tool for understanding the mechanisms underlying the consumer choice to gaze specific points in the label (De Oliveira et al., 2015). Despite the eye tracker's usefulness in identifying ways in which labels and packaging can be modified to refine consumers' capacity to detect and effectively utilize information, research mainly focuses on the nutritional labels (Graham et al., 2012).

The purpose of this study is to investigate the way through which the communication of territoriality influences the quality perception, the willingness to pay and the exploration of packaging, among the fisheries sector in the Italian context. Improving the communication of aspects such as the products' territoriality and sustainability could be a way for the regions, in particular for those in the South of Italy, to bridge the economic gap with the Northern regions, and raising for the benefit of an entire nation markets. Indeed, advantages in emphasizing the territorial origins of a product are not only limited to producers but can also results in a distribution of the economic rents for a large group of stakeholders (Pecqueur, 2001; Tregear et al., 2004). As stated by Bagautdinova et al. (2012, p. 179), "regional marketing is a tool for shaping the internal advantages of the region, investment and economic development factors, increasing attractiveness of the area as a whole." Indeed,

the economic regional progress is also linked to the tourism promotion and development, fostering each other in virtuous circle, since local/regional tourism uses local food or beverages both to enhance the tourism experience, and to support the tradition of local food/beverage production (Boyne et al., 2003).

On this basis, this study is focused on the detection of the potential of a product strictly linked to the territory, considering also that the area of origin of a product is a crucial characteristic for food products (Bryła, 2015). In this view, a role of territoriality is expected in the evaluation of the product, both from a subjective and from the visual behavior standpoints.

An important point is related to the fact that a large amount of literature on fish marketing has focused on Asian (e.g., Alam et al., 2010; Goon et al., 2012) and African markets (e.g., Abbott et al., 2015; Baba et al., 2015). In addition, much research reported greater visual attention to requests for the food origin (Van Loo et al., 2015; Drexler et al., 2018). To the best of our knowledge, the seafood marketing in Italy has never been addressed; in addition, the quantitative evaluation of the effectiveness of communication in the context of fish market in Sicily, and in general in Italy, is an unexplored field of research. More investigations in this direction could provide useful insights to companies operating in this sector and in the territoriality issues.

In these views, this study represents an additional contribution for both the literature and the applicative sides, considering a different market, such as the Italian one, contributing also in the European research in this area, bringing a contribution for the products and territorial promotions.

MATERIALS AND METHODS

Instrumentation

In order to obtain quantitative and qualitative data on visual paths (the series of fixations and saccades) and areas of interest (AOI) of the analyzed packaging, gaze data were recorded using the SMI-RED 250 eye-tracker bar (SensoMotoric Instruments GmbH) and the iView X (SensoMotoric Instruments GmbH) software, with a sample frequency of 250 Hz. iView X served also as a stimuli presentation tool. SMI-RED was attached to a 22" LCD monitor, with a pixel resolution of 1680 × 1050.

More in deep, AOI permits to define regions of a stimulus that the researcher is interested in gathering data about (Holmqvist and Andersson, 2017), and to link eye-movement measures to parts of the used stimulus. This study used AOI in order to measure Spent Time (the amount of time that consumers have spent looking at a particular AOI) and Entry Time (the time passed from the moment of the first fixation in a particular AOI) on brands and on products.

Sample and Procedures

The study involved 20 Italian university students with an average age of 23.9 (± 2.3), equally grouped for gender (10 males). The experimental station was placed in a laboratory room where the internal and external luminosity was controlled in order to standardize the environment in which the stimuli were displayed. Each subject sat on a chair placed in front of the 22" LCD monitor previously motioned. The distance between the subject and the monitor, as well as the angle of inclination between the subject's visual horizon and the eye tracker bar was controlled by the experimental operator. Once the control operations were complete, the operator started the calibration of the eye tracker. It consisted of a colored dot moving across the screen that the subject had to follow just with the gaze, keeping the head as still as possible. The recorded positions of both the dot and the subject's gaze serves to build the calibrated projection matrix, namely the mapping between the face and the monitor plane. Before presenting the experimental stimuli, the subject displayed a white sphere in the center of a black screen. The stimulus duration was about 60 s and was implemented in order to relax as much as possible once the calibration operation was finished and before the start of the experiment. During the 60 s the subject was asked to observe the white sphere and relax as much as possible.

After the preliminary calibration and baseline phase, subjects displayed the 24 stimuli. The subjects were explained that a series of images would be administered on the monitor and their task was to observe them freely. Each stimulus was consisting of the image of a single packaging, displayed for 6 s, in order to allow participants a comfortable observation of the packaging (Zhang and Seo, 2015).

In order to respect the with-in methodology of the research design, all participating subjects visualized all the stimuli, which were randomized between subjects. All the 24 stimuli have been presented in Italian. In order to collect data on the rational elaboration of the experience at the end of each visualized stimulus, three questions were proposed to the subjects. The nature of the questions and their evaluation scales will be discussed in more detail in the following paragraphs.

Packaging Stimuli

In order to optimize the collection of data without burdening the cognitive load of participants, 24 stimuli for packaging of fish products were selected from 12 Sicilian companies. The companies included in the research have been selected by the fisheries department of the Sicilian region "Dipartimento della pesca mediterranea dell'Assessorato regionale dell'agricoltura, dello sviluppo rurale e della pesca mediterranea" [*Department of Mediterranean Fisheries of the Regional Department of Agriculture, Rural Development and Mediterranean Fisheries*], which supported the present study. For each company two packaging were selected.

A further criterion for the selection of the stimuli concerned one of the fundamental drivers of the whole experiment: territoriality. Twelve stimuli presented clear references to the origin from Sicily of the displayed packaging, such as images of the island or texts referring to the place of origin of the product (see **Appendix** for examples). The products that had graphic and textual elements related to their territorial origin were not all part of the same brands. In order not to create a univocal association between the brand and the presence of territorial elements, half brands presented both a product with territorial connotation and a product without territorial connotation.

The selected packaging had very different characteristics both in terms of fish contained and in terms of shape and material.

This choice allowed us not to limit the study to specific types of packaging, but to conduct an analysis that included a wide range of characteristics from an exploratory point of view. The presence of references to Sicily therefore represents one of the major discriminating features of the whole research, as reported in the results.

Rational Evaluation

At the end of the visualization of each stimulus, the subject was asked to answer three questions to evaluate the experience. The three questions evaluated three different areas: perceived quality, economic evaluation of the product, willingness to pay. The three dimensions were asked in chronological order as previously presented. The perceived quality (Quality) was expressed on a Likert scale 1-7, whose extremes were represented by 1 = "very low quality"; 7 = "very high quality." The economic evaluation (Price) of the product and the willingness to pay (WTP) were investigated by asking subjects to select a price range. Both ranges of willingness to pay and estimated price, discretized within six categories, have been adapted to the product presented and its market price. More in dept, the six categories were the identified as the points of a price interval, created according to the minimum (MIN), maximum (MAX) and range (R = MAX – MIN) market prices of each product, provided by the fisheries department of the Sicilian region:

1. price < MIN
2. MIN < price < MIN + R/4
3. MIN + R/4 < price < MIN + R/2
4. MIN + R/2 < price < MAX – R/4
5. MAX – R/4 < price < MAX
6. price > MAX

The Quality was assessed trough the question "What is the quality of this product?", while Price and WTP were assessed trough "What is the economic value of this product?" and "How much would you be willing to pay for this product?," respectively.

The global means ± standard deviations of MIN, MAX, and R, expressed in €, were: MIN = 3.075 ± 3.957, MAX = 15.375 ± 19.787, R = 12.300 ± 15.830.

The collection of data on these three dimensions allowed to conduct correlations and statistical analysis between the emerged results and the metrics of visual and perceptual behavior extracted through the eye tracker tool.

TABLE 1 | Descriptive statistics of quality, price, and WTP in relation to territoriality.

	Territoriality	Mean	SD
Quality	N	3.733	1.655
	Y	4.729	1.584
Price	N	2.775	1.234
	Y	3.263	1.268
WTP	N	2.337	1.196
	Y	2.725	1.199

Y = presence of reference to territoriality on packaging; N = absence of reference to territoriality on packaging.

DATA ANALYSIS

The statistical analyses were performed using JASP 0.12.2 (JASP Team), an open-source R-based graphical software package (Love et al., 2019). In order to identify comparable sections in quantitative terms, the analysis of the Eye Tracker data has provided for the creation of three AOI on packaging. For all packaging, an area of interest on the brand and on the product name has been created. For packaging with characteristics related to territoriality (the Sicilian origin), an area has been created on the characterizing element. From each AOI two metrics have been extracted: Time Spent and Entry Time.

RESULTS

The results obtained from the questionnaire, eye tracker metrics (AOI metrics) and heatmaps (where spots indicate how many subjects were looking at the same time at a specific position) highlighted the importance of territoriality in the product evaluation and perception. Further insights underlined the gender difference in the packaging exploration and a relationships between the product name and the three dimensions detected in the questionnaire (Quality, WTP,

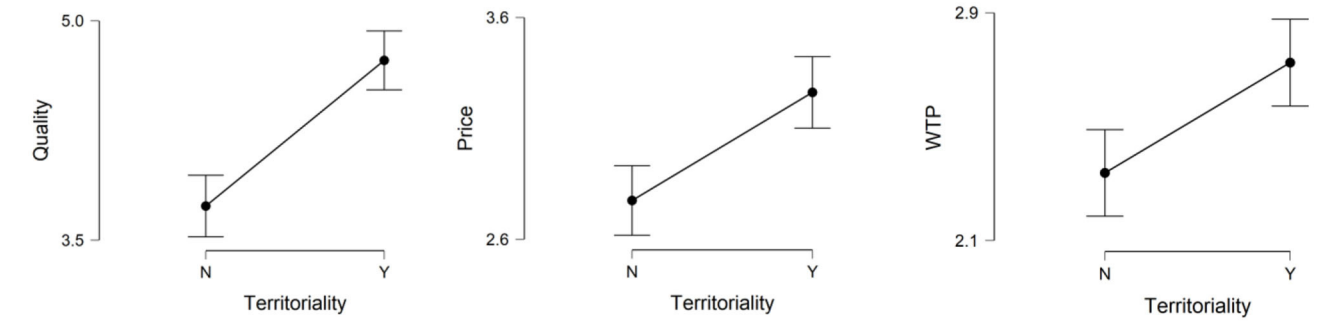

FIGURE 1 | Plot 1 – quality, price, and WTP /territoriality relation.

Price). All the results are discussed in more detail in the following paragraphs.

Effect of the Territoriality on Subjective Evaluation

The effect of territoriality on WTP, Quality and Price was assessed. Since the assumptions of normality (verified using the Shapiro-Wilk's test) and homoschedasticity (verified using the Levene's test) were not met, non-parametric Mann-Whinley's *U*-tests were performed. Additionally, the effect size was estimated by means of the Rank-Biserial Correlation coefficient r.

We found a significant and small-medium increases in Quality ($U = 19{,}733, p < 0.001, r = -0.315$) Price ($U = 22{,}680, p < 0.001$, $r = 0.212$) and WTP ($U = 23488.5$, $p < 0.001$, $r = -0.184$) for stimulus with territoriality.

Table 1 shows the descriptive statistics (mean and standard deviation) of the metrics and the following plots (**Figure 1**) show the means with the 95% confidence intervals.

All three dimensions of the questionnaire (Quality, WTP, Price) are statistically significant in relation to territoriality. In particular, all have a significantly higher average in those products that have elements of reference to Sicily. The results suggest how the presence of references to the territory influences the evaluation of the product, improving it when they are present.

Effect of the Territoriality on Eye Tracker Data

The effect of territoriality on Eye Tracker metrics was assessed. Since the assumptions of normality (verified using the Shapiro-Wilk's test) and homoschedasticity (verified using the Levene's test) were not met, non-parametric Mann-Whinley's *U*-tests were performed. Additionally, the effect size was estimated by means of the Rank-Biserial Correlation coefficient *r*.

We found significant and small increases in Product_TimeSpent ($U = 18451.5$, $p = 0.009$, $r = -0.148$) for stimulus with territoriality.

Table 2 shows the descriptive statistics (mean and standard deviation) of the metrics and the **Figure 2** contains the plot showing the mean with the 95% confidence intervals.

Eye Tracker Output on Territoriality

In order to appreciate the effective perception of territorial characteristics, the AOI metrics and heatmaps on packaging have been considered. The heatmaps shown in the **Appendix** are examples of the phenomenon on three of the analyzed products. The heatmaps were extracted from the BeGaze software of SMI (SensoMotoric Instruments GmbH). All the heatmaps confirm a similar phenomenon: the presence of elements evoking the Sicilian origin has a perceptive impact on the packaging's view. All the areas with clear references to Sicily are actually displayed. The phenomenon has therefore also been investigated at a quantitative level, through the percentage of Hit Ratio and average Time Spent of the overall sample. **Table 3** shows the average value of the AOI created in the areas of the territorial reference. It has to be noted that 75.6% of the sample actually displays the elements (Hit Rato). The average time spent on the area is about 593.6 ms (± 324.9). This data seems to confirm the results that emerged from the previously exposed data on the difference in Product_TimeSpent, Quality, WTP and Price averages. In addition to a significant difference, it is possible to suggest that this difference probably originates from the effective visualization of the territorial connotation.

TABLE 2 | Descriptive statistics of Product Time Spent in relation to territoriality.

	Territoriality	Mean	SD
Product_TimeSpent	N	1276.438	865.120
	Y	1525.543	979.288

Y = presence of reference to territoriality on packaging; N = absence of reference to territoriality on packaging.

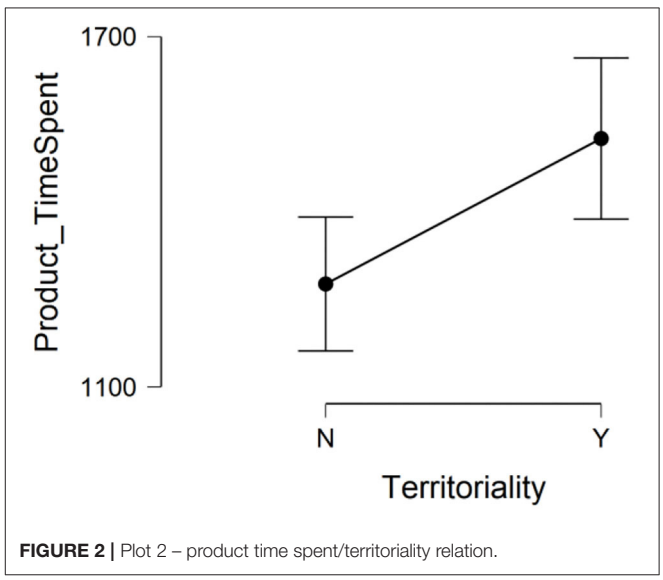

FIGURE 2 | Plot 2 – product time spent/territoriality relation.

TABLE 3 | Average value of AOI related to territoriality.

	AOI with references to territoriality (Overall Sample)
Time spent	593,5 ms
Hit ratio	75,60%

TABLE 4 | Descriptive statistics of Brand Time Spent, Brand Entry Time, Product Time Spent, and Product Entry Time in relation to gender.

	Group	Mean	SD
Brand_TimeSpent	F	1246.057	767.705
	M	919.933	720.270
Brand_EntryTime	F	845.623	979.168
	M	1572.285	1594.931
Product_TimeSpent	F	1533.048	872.921
	M	1237.710	964.063
Product_EntryTime	F	1039.887	978.423
	M	1314.530	1180.318

F = Female; M = Male.

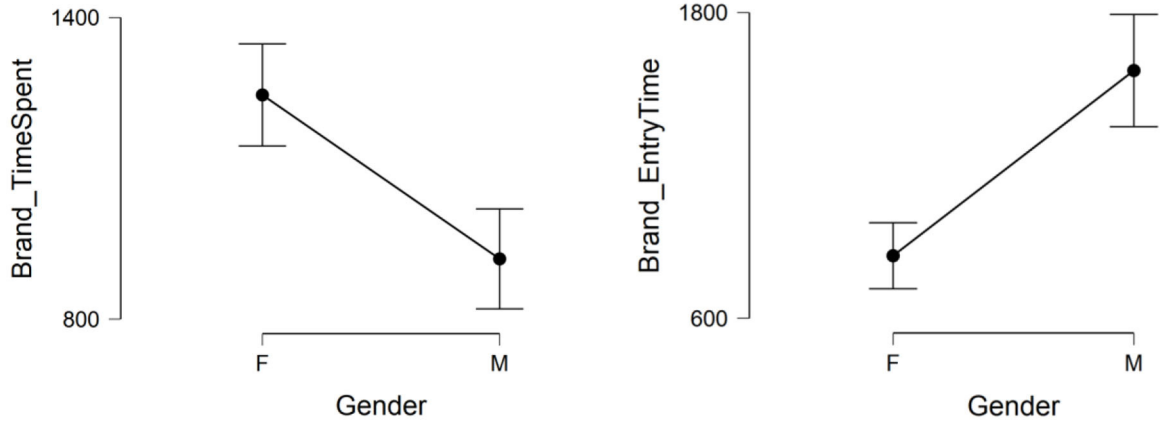

FIGURE 3 | Plot 3 – brand time spent, brand entry time/gender relation.

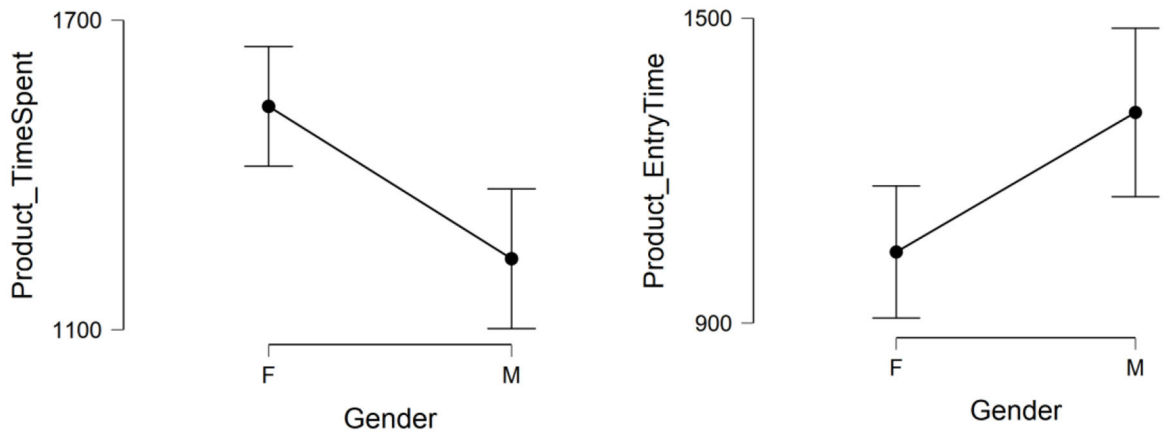

FIGURE 4 | Plot 4 – product time spent, product entry time/gender relation.

Effect of the Gender on Eye Tracker Data

In order to obtain a research that would cover as many drivers as possible in the optimization of fish communication, a possible gender difference in the exploration of stimuli was considered. Since the assumptions of normality (verified using the Shapiro-Wilk's test) and homoschedasticity (verified using the Levene's test) were not met, non-parametric Mann-Whinley's *U*-tests were performed. Additionally, the effect size was estimated by means of the Rank-Biserial Correlation coefficient r.

A small increase of Brand_TimeSpent ($W = 28779.5$, $p < 0.001$, $r = 0.0271$) and Product_TimeSpent ($W = 2{,}6625$, $p < 0.001$, $r = 0.229$) as well as a small decrease of Brand_EntryTimes ($W = 15929.5$, $p < 0.001$, $r = -0.297$) and Product_EntryTime ($W = 18592.5$, $p = 0.012$, $r = -0.142$) was found for the Females.

Table 4 shows the descriptive statistics (mean and standard deviation) of the metrics and the following plots (**Figures 3**, **4**) show the means with the 95% confidence intervals.

Effect of the Gender on Subjective Evaluation

The effect of the gender on WTP, Quality and Price was assessed. Since the assumptions of normality (verified using the Shapiro-Wilk's test) and homoschedasticity (verified using the Levene's test) were not met, non-parametric Mann-Whinley's *U*-tests were performed. Additionally, the effect size was estimated by means of the Rank-Biserial Correlation coefficient *r*.

No statistical difference was found for WTP, Quality, and Price between Males and Females.

Effect of Subjective Evaluation on Eye Tracker Metrics

Within an exploratory perspective, a relation between the Eye Tracker metrics and the data obtained from the three items of the questionnaire (Quality, WTP, Price) has been searched. Since the assumptions of normality of the residuals (verified by the Q-Q plot) and homoschedasticity (verified using the Levene's test) were not met, for each Eye Tracker metric, three non-parametric Kurskal-Wallis tests (one for each Subjective Evaluation) were performed, considering as factor, respectively, WTP (six levels) Quality (seven levels) and Price (six levels).

Significant effect of Quality on Product_TimeSpent was found ($\chi^2(6) = 24.846$, $p < 0.001$). Dunn's *post-hoc* comparison (Bonferroni-corrected) confirmed a significant difference between levels 1–4 ($z = -4.475$, $p < 0.001$), 1–5 ($z = -4.131$,

TABLE 5 | Descriptive statistics for the evaluation levels of the Quality dimension.

Quality	Mean	SD
1	755.937	504.910
2	1282.685	848.816
3	1233.767	806.552
4	1594.302	970.524
5	1527.717	981.541
6	1493.322	956.454
7	1415.748	1011.290

TABLE 6 | Descriptive statistics for the evaluation levels of the Price dimension.

Price	Mean	SD
1	1052.357	866.959
2	1208.583	778.633
3	1397.779	903.143
4	1593.933	947.039
5	1902.606	1132.705
6	1502.400	1109.201

TABLE 7 | Descriptive statistics for the evaluation levels of the WTP dimension.

WTP	Mean	SD
1	1163.142	804.263
2	1281.409	851.111
3	1517.974	982.546
4	1693.370	1061.087
5	1766.441	805.824
6	1168.888	1110.447

$p < 0.001$), 1–6 ($z = -3.746$, $p = 0.002$), and 1–7 ($z = -2.864$, $p = 0.044$).

Table 5 shows the descriptive statistics (mean and standard deviation) of each level.

Significant effect of Price on Product_TimeSpent was found ($\chi^2(5) = 22.655$, $p < 0.001$). Dunn's *post-hoc* comparison (Bonferroni-corrected) confirmed a significant difference between levels 1–4 ($z = -3.465$, $p = 0.004$), 1–5 ($z = -3.794$, $p = 0.001$), 2–4 ($z = -2.826$, $p = 0.035$), and 2–5 ($z = -3.215$, $p = 0.010$).

Table 6 shows the descriptive statistics (mean and standard deviation) of each level.

Significant effect of WTP on Product_TimeSpent was found ($\chi^2(5) = 17.449$, $p = 0.004$). Dunn's *post-hoc* comparison (Bonferroni-corrected) confirmed a significant difference between levels 1–4 ($z = -2.973$, $p = 0.022$).

Table 7 shows the descriptive statistics (mean and standard deviation) of each level.

The following figure with the plots (**Figure 5**) shows the means with the 95% confidence intervals.

The analysis seems to suggest a possible relationship between the time spent by consumers on the name of the product, the perceived quality, the willingness to pay and the estimated price on the market. In particular, a better overall perception of the product seems to be linked to a greater interest in the product's name.

Correlation Between Eye Tracker Metrics and Subjective Evaluation

A correlation analysis between Eye Tracker metrics, Subjective Evaluations, Gender and Territoriality was performed. Territoriality and Gender were codified respectively, as Y (Yes) =1; N (No) = 0, and as M (Male) =0; F (Female) =1. Since the assumption of bivariate normality (verified using the Shapiro-Wilk's Test) was not met, a non-parametric Spearman coefficient was computed.

Significant correlations were found for Price-Quality ($\rho_{(478)} = 0.646$, $p < 0.001$), WTP-Quality ($\rho_{(478)} = 0.649$, $p < 0.001$), WTP-Price ($\rho_{(478)} = 0.865$, $p < 0.001$), Brand_TimeSpent-Quality ($\rho_{(424)} = -0.148$, $p = 0.002$), Brand_TimeSpent-WTP ($\rho_{(424)} = -0.098$, $p < 0.042$), Brand_EntryTime-Quality ($\rho_{(424)} = 0.153$, $p = 0.002$), Brand_EntryTime-Brand_TimeSpent ($\rho_{(424)} = -0.427$, $p < 0.001$), Product_TimeSpent-Quality ($\rho_{(415)} = 0.157$, $p = 0.001$), Product_TimeSpent-Price ($\rho_{(415)} = 0.221$, $p < 0.001$), Product_TimeSpent-WTP ($\rho_{(415)} = 0.179$, $p < 0.001$), Product_TimeSpent-Brand_EntryTime ($\rho_{(375)} = -0.190$, $p < 0.001$), Product_EntryTime-Product_TimeSpent ($\rho_{(415)} = -0.202$, $p < 0.001$), Territoriality-Quality ($\rho_{(478)} = -0.277$, $p < 0.001$), Territoriality-Price ($\rho_{(478)} = -0.189$, $p < 0.001$), Territoriality-WTP ($\rho_{(478)} = 0.165$, $p < 0.001$), Territoriality-Brand_EntryTime ($\rho_{(424)} = 0.101$, $p = 0.038$), Territoriality-Product_TimeSpent ($\rho_{(415)} = 0.128$, $p = 0.009$), Gender-Brand_TimeSpent ($\rho_{(424)} = 0.234$, $p < 0.001$), Gender-Brand_EntryTime ($\rho_{(424)} = -0.257$, $p < 0.001$), Gender-Product_TimeSpent ($\rho_{(415)} = 0.198$, $p < 0.001$), and Gender-Product_EntryTime ($\rho_{(415)} = -0.123$, $p = 0.012$).

Figure 6 shows the heatmap of the correlation coefficients, with the related significances marked ($^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$).

DISCUSSION AND CONCLUSION

The purpose of this article was to investigate the way in which the communication of territoriality can influence the quality perception, the willingness to pay and the exploration of packaging.

This study is proposed as pioneering, for the used techniques, in the research and experimental study of the communication of fish products. The study of the visual behavior of consumers has allowed the correlation and analysis of strictly perceptual metrics such as those related to AOI on brand and product, with those resulting from the rational elaboration of the experience. The results of the drivers identified crucial points for the future communication of fish products and the promotion of the territory. In particular, the analysis lays the foundations for a reorganization of the approach to the creation of product packaging, through greater attention to detail and the intrinsic values that this can express. Among these, the importance

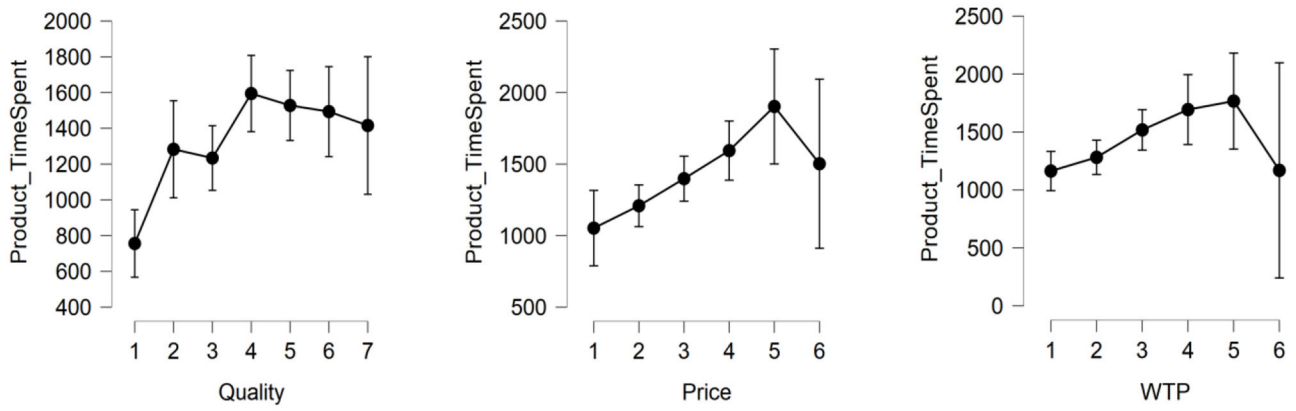

FIGURE 5 | Plots for the product time spent for quality, price, and WTP.

of territorial origin in the impact on product evaluation has been found.

As for the eye tracker data, the effect of territoriality on eye tracker metrics has been considered. Data suggests that an Eye Tracker variable seems to be linked to the territoriality. In actual fact, the time spent by participants on the product, named Product_TimeSpent is significantly higher in stimuli that have a territorial characterization. The attention paid to the name of the product and its characteristics seems to increase if there is a reference to the Sicilian origin. As shown in the correlation table (**Figure 6**) it is possible to consider other phenomena that need further study. The perceptive data on the brand, probably related to the more or less attractive characteristics of the fonts and their size, do not seem to be particularly relevant. Also the Product_EntryTime does not seem to be affected by the presence of territorial characterizations. Also in this case, the possible presence of other elements and characteristics could influence the non-significance of the data. In a pioneering study such as the one presented, these considerations represent the starting point for further investigation.

Moreover, to deepen the role of the territoriality, it has been detected through the consideration of AOI metrics and heatmaps on packaging. The analysis of the heatmaps and AOI of the elements characterizing the territory (the Sicilian origin) has highlighted how these are displayed, triggering the perceptive interest of consumers. In fact, all areas in the packaging with a clear reference to the territory of Sicily have been seen by the participants. These data are important evidence confirming the attractiveness of the regional origin of food products, that is increasing over the mass production (Domański and Bryła, 2013). Moreover, the visual impact of the elements characterizing the Sicilian origin is related to a greater interest in the product and its characteristics (Product_TimeSpent), as well as the perceived quality, the willingness to pay and the estimated price. Taking together, all these data are in line with studies suggesting that the area of origin is an important element when considering the food product (Bryła, 2015), and suggesting that, within different elements, territoriality and typicity are crucial elements of the origin of the products determining their credibility (van der Meulen, 2007).

In order to better assess the visual behavior to deepen the applicative side of fish communication, the study detected gender differences in visual attention while exploring packaging, showing some significant differences. In particular, females have a greater focus on the identity aspects of the product, the brand and the product name. The results showed that females actively seek this information more than male (Brand_EntryTime; Product_EntryTime) and pay more attention on it (Brand_TimeSpent; Product_TimeSpent). These differences in visual attention seem to be in line with a study by Darley and Smith (1995). Their study, indeed, showed that women are more sensitive to details and have a more complete visual processing of the stimulus. However, the differences found in visual attention did not show to have a significant effect on the self-report evaluations of the products.

As for correlation, the study has highlighted significant correlations on the role of the territory as a perceptive guide in the evaluation of the product. In fact, the territoriality variable is highly and positively associated with Quality, in line with studies suggesting that the region of origin of one product is an indicator of quality (Philippidis and Sanjuán, 2003). Moreover, territoriality shows positive correlations also with Price and WTP. These data are important since they are consistent with literature showing that the perception of the origin of a product and of quality are linked to the willing to pay a higher price for a product (Loureiro and McCluskey, 2000; Scarpa et al., 2005). Moreover, these data give further value to the importance of the composition and layout of the packaging of fish products, suggesting that the presence of the origin of a product, is a key factor for the product communication and attractiveness for consumers. Indeed, attention paid to the product name (Product_TimeSpent) has shown a high and positive correlation with Price, followed by other positive correlations with WTP, Quality and territoriality. This suggests that both information, territoriality and the name of the product, requires greater visibility on the label as it increases the value attributed to the

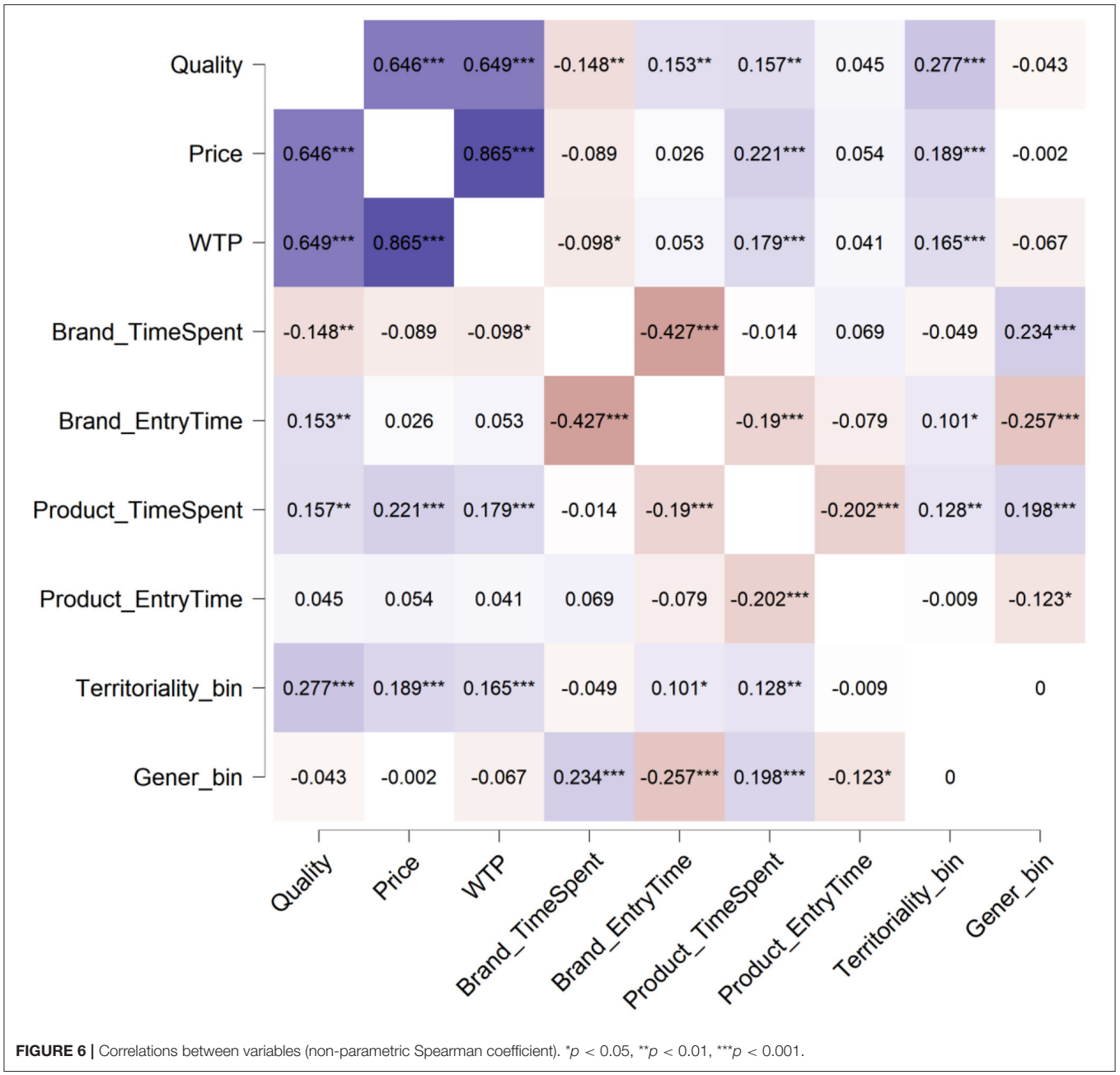

FIGURE 6 | Correlations between variables (non-parametric Spearman coefficient). $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

product. The role of territoriality has been therefore confirmed in this study, as expected. Moreover, the same trend of previous analyses, was found in the analyses related to the subjective evaluation of Quality, Price and WTP in relation to territoriality. When stimulus showed the link to territoriality, that is the region of origin of the product, Quality, Price, and WTP were evaluated as higher, in particular as for Quality. This data is in line with the results of the analyses of the effect of subjective evaluation on eye tracker metrics. With reference to the Product_Time spent, Quality, and Price, indeed, showed significant effect particularly between the lowest levels of the evaluation scale and the highest, suggesting a possible relationship between the perceived quality and WTP and the estimated price with the time spent by consumers on the specific name of a product. This is a very interesting issue that has to be considered in the promotion and in the communication of a product. The possibility to attract the attention and to make the consumer engaged in spending time on a product name, with positive association with Quality and WTP, seems to be linked to the presence of the origin of the product. From an application point of view, this would represent an important key factor to promote a product a and its territory. For the specific Sicilian region, to which products and stimuli of this study are referred, adding the origin of a product could be the best solution for the fisheries regional market. It has

to be underlined that these important results can be useful for considering the role of territoriality also for other products and brand, in order to better communicate this as a value and to promote products and territories also among other categories.

This study, shows an innovative perspective based not only on the subjective evaluation by consumers on the product and its characteristics. In fact, the use of neuromarketing techniques has proved valid in identifying what is the main information that is processed for the evaluation of the product. Neuroscience techniques, indeed, give an added value that is the possibility to study the processing of information considering the role played by emotions (Passyn and Sujan, 2006). According to studies on consumers behaviors and decision processes, measurements based on the registration of neuro-physiological parameters, could give an accurate and reliable results due to the fact that lacks the mediation of the cognitive processes (Poels and DeWitte, 2006; Missaglia et al., 2017). Neuroscience applied to marketing issues, indeed, has the aim to discover what is happening in the brain in response of some stimuli from products, brain or advertising to discover which strategy lead to the buying process. This study used one of the main tool used in neuromarketing, that is the eye tracker, giving a new perspective through a neuroscientific approach. The importance of Neuromarketing techniques in assessing the perceptive and emotional experience of consumers when approaching the product could be a key asset for the consumption of fish products in the future.

For this reason, a limitation of this study is represented by the use of a unique neuromarketing tools. Future studies should focus also on the neuro and psychophysiological signals, in order to measure the consumers' emotional reaction to products, that is a spontaneous aspect of emotional reaction in real time, and to investigate communication strategies focused on food packaging (Russo et al., 2020a). Moreover, future studies should verify the effect of cross-media exposure in the communication strategy, which could help in the detection of the most effect of combination on media, improving the communication performance (Russo et al., 2020b). This aspect would be very functional and helpful to deepen the relationship between the territoriality and the exposure to the product.

Another limitation of this study is the use of a small group of participants. Within neuromarketing literature, this is not a very small sample, but it could be enlarged in order to have more generalizable data, read in the light of a different source of knowledge (Ferguson et al., 2014). Moreover, future studies could consider also a specific sample composed by regular fish consumers, in order to better capture their attitude and behavior toward this specific packaging and territoriality characteristics. For this reason, this research can be considered a first exploratory and pilot study for the detection of fish consumers behaviors, a model which can be also extended to other products, brand and territories.

However, this study highlights a specific element, the territoriality, to optimize the communication of fish products in a circular and continuously improving vision. In addition, further analysis may be conducted on the role of some variables and the correlations highlighted. The study, although it had a clear initial hypothesis, highlighted further phenomena that could be investigated later, opening a new line of research.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee of the IULM University. The participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

MZ, LM, and VR designed the research. AF, RC, FR, and MBi collected the data and carried out data analysis and interpretation. MZ, AF, RC, MBi, and VR wrote the manuscript. FR, MBe, and VR edited the final version. VR, LM, RC, and MZ supervised the project and the paper writing. All authors contributed to the present study and the final version of the manuscript has been approved for submission by all authors: they are accountable for the whole work.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcomm.2021.659484/full#supplementary-material

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Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.