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Analysis of the customer experience in digital social networks: Restaurants in the city of Ibagué-Colombia

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Abstract

This study analyzes the customer experience in digital social networks within the restaurant sector in Ibagué, Colombia, assessing how engagement and implicit attitudes shape consumer perceptions. Using a mixed-methods approach, the research selected top-rated restaurants on TripAdvisor and collected engagement metrics from their Instagram and Facebook accounts. Additionally, an Implicit Association Test (IAT) was applied to measure unconscious consumer attitudes toward visual content. Findings indicate that engagement does not always correlate with follower count; restaurants with fewer but highly interactive followers demonstrated stronger engagement. The IAT results showed mild but significant associations between implicit attitudes and engagement, suggesting that consumer perceptions are influenced by subconscious responses to digital content. The study highlights the role of digital engagement in shaping customer experiences and emphasizes the need for strategic content creation to foster meaningful interactions. These insights can help restaurant owners and marketers optimize their social media strategies by prioritizing visually compelling content and encouraging active consumer participation to enhance digital engagement and strengthen brand perception.

Keywords: Consumer experience, engagement, Implicit Association Test (IAT), restaurants, social media.

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1. Introduction (First-Order Epigraph Arial 11 Bold)

Nowadays, digital social media has become indispensable for both individuals and businesses. This medium not only acts as a means of communication but also as a platform for interaction where people can express their opinions and preferences, while businesses can collect this information to improve customer experience, both online and in real life.

Unlike previous times, where communication was mostly one-way, with organizations broadcasting their message without receiving immediate feedback from their audiences, social media has revolutionized this process. Now, businesses can receive direct and almost instant feedback from their customers, allowing them to improve their processes and adapt to their needs more efficiently.

This research focused on analyzing the relationship between customers and restaurants through social media, exploring the customer experience in this context. The research process began by identifying the restaurants with the highest user ratings on the TripAdvisor platform. Data was then collected from these restaurants' social media accounts, and the engagement level was calculated, allowing us to determine which generated the most interest and commitment among their audience. In addition, a tool called the Implicit Association Test (TAI) was applied to understand users' unconscious attitudes toward the content posted by these restaurants on their social media accounts. The aim was to identify both the positive and negative associations that users had towards each restaurant.

This research focused on the restaurant sector for several reasons. First, this sector was one of the most affected by the pandemic, with a high number of establishment closures in Colombia. According to the Colombian Association of the Gastronomic Industry (Acodres), around 27,600 establishments were closed, which represented a great challenge for the industry. Second, restaurants are one of the most active sectors on social media, as they have had to generate more content to attract the public and maintain their sales during the pandemic [1]. Virtuality has become an important resource for the sector.

Finally, it was considered essential to improve the quality of the online offer based on the customer experience [2]. Virtuality now appears as the lifeline of the industry. Although in Colombia, the sale of food at home was already quite developed, many high-end restaurants did not offer this option. COVID-19 forced them to reinvent themselves [3]. Due to the global situation at that time, the home delivery service experienced a significant increase. Therefore, it was vitally important for restaurants to carry out digital marketing strategies to adapt to this new reality. In Colombia, a clear change in consumer preferences was observed, as the majority chose to order food from nearby local restaurants, that is, those that were in their neighborhood or were small chains. This represented approximately 5% of the total orders [4]. However, the telephone remains the main channel of contact between users and restaurants since 64% of people who order directly from the establishment do so through these means, followed by WhatsApp, the website, an application, or social networks [5].

The research was carried out in the city of Ibagué, capital of the department of Tolima in Colombia, which has many gastronomic establishments, according to the TripAdvisor portal, which reports a total of 232 establishments in the city.

1.1. Customer Experience

Meyer and Schwager [6] define customer experience as the internal, subjective response customers have to any contact (direct or indirect) with a company. Customer experience is a holistic concept that encompasses all aspects of a company's offering [7]. Direct contact typically occurs during purchase, use, and service and is initiated by the customer. Indirect contact typically involves unplanned encounters with representatives of a company's products, services, or brands and takes the form of word-of-mouth recommendations or reviews, advertising, news reports, reviews, etc. [6].

Customer experience originates from a set of interactions between a customer and a product, a company, or part of its organization, which provokes a reaction. This experience is strictly personal and involves the customer's participation at different levels (rational, emotional, sensory, physical, and spiritual) [8].

However, researchers have focused on measuring customer satisfaction and service quality [9, 10]. However, it is not that customer experience has never been considered, as both satisfaction and service are part of the customer experience. Most notably, Hirschman and Holbrook [11] theorized that consumption has experiential aspects. Schmitt [12] has explored how companies create experiential marketing by making customers feel, think, act, and relate to a company and its brands.

Companies have embraced customer experience to gain a sustainable competitive advantage [13], leading some authors to claim that customer experience will be the next competitive battlefield [14].

1.2. Social Media

A social network is a structure formed by a group of people or organizations connected by certain interests that benefit them [15]. In the research carried out by the International Bureau of Advertising on social networks, social networks that exist on the Internet are also defined as "digital communication platforms that allow users to generate content and share information through private or public files" [15]. Another definition clearly states that a social network is a series of applications, including social platforms, blogs, photo blogs, Weibo, or any support that allows users to generate shared content [16].

In social media, marketing consists of a series of multidirectional dialogues; it is participatory and part (or most) of its content is generated by consumers themselves [17].

1.3. The Digital Consumer and the Customer Experience

In the past five years, the marketing of products and services on the Internet has been one of the most important developments in the information systems industry. The growth of digital marketing presents unique challenges for marketing and information systems managers [18]. In recent years, with the rapid changes in the media landscape, the business has embraced social media to interact with customers. The business report shows that the total global spending on social media advertising has increased (US$17.74 billion in 2014 and US$11.36 billion in 2013, an increase of 56.2%), which is reflected in the social media engagement driving sales [19]. In this regard, customer satisfaction (CS) is a key factor in measuring online customer loyalty [20].

Some researchers have recognized the multidimensional nature of trust. In the field of social psychology, Rempel et al. [21] discussed predictability, reliability, and belief as the three components of interpersonal trust. McAllister [22] believes that interpersonal trust has both cognitive and emotional dimensions. Similarly, Johnson and Grayson [23] proposed that trust in service relationships at the consumer level has both cognitive and emotional levels. Another axis to consider is research in the field of social media. These studies focus on the impact of user-generated content (UGC) on market outcomes in various situations, such as book sales [24] and movie box office revenues [25], and music album sales [26]. For example, some studies examine people's motivations for deciding to contribute content on social media [27] while other studies focus on how UGC interacts with traditional media marketing [28]. Since UGC is a source of effective word-of-mouth communication [29] and an indicator of product quality [30], it is understandable that the role of UGC in previous research is important.

1.4. Engagement and Social Media

Engagement for marketing can be approached as a succession of consumer experiences associated with digital communication technologies or Internet applications (web pages, social networks, blogs, etc.) that are available to a brand's audiences so that they interact, create content, and share it through their online social media [31]. From this perspective, digital consumers act as an active entity in the production of content for communication, expressing their experiences through publications that aim to serve as guidance to their peers in the purchasing and consumption processes of a product, service, or brand [32, 33]. By relating engagement to marketing, we find that the role of users is especially focused on knowing what others are commenting on in online applications. These users also demonstrate their interest in devoting time and energy to interacting with other users and presenting their opinions on various situations [34, 35]. This shows that users committed to brands understand that within the digital platforms of these brands, there is valuable content for their personal or professional lives.

One of the drawbacks of social media management for companies and their managers is the existence of multiple channels where they can communicate their brand and create communities, which makes it difficult to fully integrate and analyze these networks. This occasionally leads consumers to be more selective in the way they view and interact [36].

Despite their social nature and dynamics, social media platforms have been used as a sales promotion and delivery channel, which can have an impact on brand equity [37].

2. Materials and Methods

In the development of the research, a mixed methodology was chosen that had a mainly quantitative approach. This was because information related to the generation of content on social networks was collected, an implicit association test was used and the correlations between the variables were evaluated, specifically between the results of the test and the calculation of engagement on social networks.

Correlation coefficient played a key role in this study as it is an important statistical tool for analyzing bivariate linear relationships. This analysis was applied to cross-sectional or time series data, thus allowing the exploration of connections between the different variables involved in the research [38].

2.1. Choice of Restaurants

In the first stage of the research, the thirty restaurants with the highest user ratings in the city of Ibagué were initially selected, according to the ratings available on the TripAdvisor portal. It is worth mentioning that a total of 232 restaurants in the city are registered on this platform.

This sample was then analyzed on social media, with the aim of establishing a relationship between the ratings obtained on TripAdvisor and the level of engagement observed on social media platforms. Based on this analysis, the five best-positioned restaurants were selected using a previously defined selection rubric.

A more in-depth investigation was then carried out, focusing on the relationship between interactions generated on social media and the impact of posts. This analysis addressed various aspects, such as the brand's visual identity and the emotions that its posts aroused among its followers

2.2. Sample Size

An Implicit Association Test (TAI) was applied to a group of 30 people residing in the city of Ibagué. This group consisted of individuals ranging in age from 19 to 66 years, composed equally of 50% men and 50% women. The selection of participants was done randomly to ensure the representativeness of the sample.

The TAI was used to identify product hierarchies, using comparisons between the five best-performing brands and the five worst-performing brands in the study. This approach allowed for the assessment of participants' associations with brands and to determine how they ranked in their perceptions. De Houwer and De Bruycker [39] argue that implicit measures may be less biased by deliberate attempts to conceal attitudes and may even reflect attitudes of which the respondent is unaware.

2.3. Choosing Social Media

In the research, data was collected from the social media platforms Instagram and Facebook, as these were the most used by Colombians, especially during the pandemic. According to a report by the newspaper La República, it was noted that 66% of Colombians used Facebook, while 58% preferred Instagram. These social media became important channels for online communication and interaction during that period [40].

2.4. Choosing Social Media

In the development of the research, information was collected from the restaurants' social networks. These data sources were considered as the main source of information. During this process, various aspects were evaluated, including the number of followers, the number of "likes," the number of comments, and the number of times the posts were shared. It is worth mentioning that this data collection was carried out within a previously established time to ensure the consistency of the results [41]. To measure engagement, the following formulas will be used [42]:

$$ER=\frac{(n°\ likes+n°shares+n°comments)over\ period\ of\ time}{\frac{Number\ of\ posts\ over\ period\ of\ time}{Number\ of\ fans}}X100$$

$$ER=\frac{(n°\ likes+n°comments)over\ period\ of\ time}{\frac{Number\ of\ posts\ over\ period\ of\ time}{Number\ of\ fans}}X100$$

Figure 1.
Engagement formulas rate for Facebook and Instagram.
Source: Human Level Communications.

These formulas were chosen because the tool used to collect the data, Metricool, provided each of the elements needed to calculate engagement. This simplified the process by allowing data to be entered directly to obtain the engagement result. An additional reason for choosing these specific formulas was that Metricool considered the differences between each social network. It recognized that the way of interaction varies significantly from one platform to another. In addition, many companies valued the calculation of engagement based on the number of followers, arguing that it provided a more accurate and realistic representation compared to using views or other metrics [43].

To evaluate the level of user interaction with the restaurants on social networks, specific Facebook and Instagram metrics were used. These metrics made it possible to calculate engagement, a fundamental measure for analyzing the active participation of followers. The variables considered for this analysis are presented below:

Table 1.
Key Metrics for Social Media Engagement Calculation.

Restaurant	Social Network	Likes	Posts	Reactions	Comments	Shared	Followers	Engagement
Augurio	Facebook		17	89	5	5	6509	0.09%
	Instagram	4265	99		1167		7340	0.75%
El Carnaval del Pollo	Facebook		23	253	13	30	5715	0.23%
	Instagram	234	27		7		672	0.36%
La Table de Michel	Facebook		16	94	12	6	1191	0.59%
	Instagram	2661	100		88		1784	1.56%
Encanto del mar gourmet	Facebook		4	45	4	9	3610	0.40%
	Instagram	7142	100		125		6603	1.11%
Tutto Gelato	Facebook		0	0	0	0	2210	0.00%
	Instagram	724	12		23		1613	0.47%
Puerto Madero	Facebook		65	320	26	52	2115	0.29%
	Instagram	1037	100		36		758	1.43%
La Parrilla de Marcos	Facebook		40	400	10	30	9553	0.12%
	Instagram	2734	99		74		3664	0.77%
La Comarca	Facebook		12	52	0	12	14382	0.04%
	Instagram	857	53		220		537	2.03%

La Ricotta Tratoria	Facebook		1	0	0	0	853	0.00%
	Instagram	1097	20		14		5407	0.21%
Kioto	Facebook		18	63	0	3	4844	0.08%
	Instagram	2475	35		29		8618	0.29%
Fervor Restaurante	Facebook		64	1743	64	255	2041	1.58%
	Instagram	3640	99		1146		5780	0.84%
London House	Facebook		5	55	1	7	14961	0.08%
	Instagram	3545	96		107		8186	0.45%
Barzal Café	Facebook		26	141	9	7	1026	0.59%
	Instagram	3182	80		114		2911	1.14%
Fauna Restaurante	Facebook		3	9	1	7	2348	0.24%
	Instagram	2111	39		119		5410	0.42%
Tango burger shop Pasión por la Carne Ibague	Facebook		10	57	0	23	10015	0.08%
	Instagram	4959	25		265		7812	0.68%
DeRegio	Facebook		26	115	3	10	9386	0.05%
	Instagram	3017	99		5492		3683	2.33%
Asadero Don Pedro	Facebook		207	9636	507	855	27493	0.19%
	Instagram	4830	85		85		14700	0.34%
Budablues restaurante comida india	Facebook		18	103	11	6	2534	0.26%
	Instagram	3017	99		89		4588	0.68%
Asadero Coma Carne	Facebook		3	13	1	8	1799	0.41%
	Instagram	484	29		435		630	1.47%
el churrasco	Facebook		120	5008	278	2653	9672	0.68%
	Instagram	3066	100		61		3842	0.82%
Restaurante Perú Pisco	Facebook		1	6	1	0	1933	0.36%
	Instagram	39	3		0		1375	0.03%
República Cevicheria	Facebook		0	0	0	0	1198	0.00%
	Instagram	48	2		1		1362	0.04%
Steakhouse Madero	Facebook		29	235	7	33	8345	0.11%
	Instagram	2206	98		55		7953	0.29%
Sonata Café Lounge	Facebook		60	273	3	191	4499	0.17%
	Instagram	98	24		1		657	0.15%
Yerbabuena Restaurante y Café Lounge	Facebook		1	4	0	53	11501	0.50%
	Instagram	442	27		7		1490	0.30%
Riso	Facebook		1	73	9	19	728	13.87%
	Instagram	392	7		12		1063	0.38%
Biagio Braceria Italiana	Facebook		36	143	2	7	4179	0.10%
	Instagram	1410	62		21		1816	0.80%
El Gran Camaron Killero	Facebook		17	329	16	29	15772	0.14%
	Instagram	4050	100		90		7046	0.59%

mantel restaurante	Facebook		3	17	3	3	772	0.99%
	Instagram	942	17		36		3974	0.25%
plaza express	Facebook		39	72	1	6	9915	0.02%
	Instagram	870	100		6		8968	0.10%

Source: Elaboration own based in the proposal to calculate the engagement of Núñez [43].

2.5. Implicit Association Test (IAT)

Once the results were obtained, the five restaurants with the best and worst engagement were selected. Then, the images that had been published on the social networks of these restaurants were downloaded. These images were used in the development of the test designed to measure the interest of the people who were part of the research sample.

Table 2.
Emotional words applied in the TAI.

Positive	Negative
Enjoy	Disgusting
Happiness	Stinky
Satisfaction	Repulsive
Pleasant	Disgusting
Delicious	Lapsed
Get excited	Bad Smell
Rich	Awful
Appetizing	Fatty

Source: Hinojosa [44].

Implicit Association Test (IAT) was applied following the methodology proposed in Houwer [45]. This measurement approach had certain key attributes that had to be met. These attributes implicitly included the ability to measure attitudes even when participants had no conscious knowledge of them (ignorance), the fact that participants used these attitudes unconsciously, and/or had no conscious control over the test results (uncontrollability). For these reasons, these measures are commonly referred to as indirect measures or automatic measures. This approach was based on the idea that functional factors determine the results of the IAT. After careful analysis of these attributes and characteristics, the IAT was applied to the research. De Houwer and Moors [46] defined implicit measurement as "the measurement result based on an uncontrolled, unintentional, autonomous and goal-independent process, which is determined by unconscious, effective or rapid stimulus impulse."

2.6. Linear Regression and Correlations

To explore the relationship between interaction in social networks and implicit consumer attitudes, a correlation analysis was performed between engagement and the results of the Implicit Association Test (IAT). The following table summarizes the value study obtained in this study:

Table 3.
Relationship between engagement and TAI results.

Restaurant	Facebook Engagement	Instagram Engagement	TAI Results	Facebook correlation	Instagram correlation
Riso	0.1387	0.0038	0.21	0.59	-0.301
Fervor	0.0158	0.0084	0.03		
DeRegio	0.0005	0.0233	0.02		
La Table de Michel	0.0059	0.0156	-0.04		
La Comarca	0.0004	0.0203	0.06		
Kioto	0.0008	0.0029	0.06		
Sonata Café Lounge	0.0017	0.0015	-0.04		
La ricotta	0.0000	0.0021	0.02		
plaza express	0.0002	0.0010	0.03		
República Cevicheria	0.0000	0.0004	0.21		

The correlation coefficient measures the degree of linear association between any two variables and can be calculated by dividing the covariance of both by the product of the standard deviations of the two variables [47] and regression models allow the evaluation of the relationship between a variable (dependent) with respect to other variables as a whole (independent). Regression models are expressed as follows: $Y= f(x1, x2, \ldots) + \varepsilon$ [48].
The concepts of correlation and regression are expanded in the results section.

3. Results and Discussion

Below are the restaurants selected according to the TripAdvisor platform, which are shown in the following table in order of popularity.

Table 4.
TripAdvisor restaurant rankings.

Restaurant	Qualification	# Of opinions
Augury	4.5	84
The Chicken Carnival	4.5	178
Michel's Table	4.5	149
Charm of the Gourmet Sea	4.5	106
Everything Gelato	4	132
Puerto Madero	4	166
Marcos' Grill	4	171
The Shire	4.5	68
Ricotta	4	90
Kyoto	4	91
Fervor Restaurant	4.5	27
London House	4	51
Barzal Café	5	17
Fauna Restaurant	4.5	27
Tango Burger Shop	4.5	32
DeRegio	4.5	69
Don Pedro Grill	4	46
Budablues Indian Food Restaurant	5	23
Eat Meat Grill	4	29
The barbecue	4.5	5
Peru Pisco Restaurant	4.5	48
Cevicheria Republic	5	9
Steakhouse Madero	4.5	14
Sonata Café Lounge	5	10
Yerbabuena Restaurant	4	25
Riso	4.5	8
Biagio Braceria Italian	3.2	14
The Great Killer Shrimp	4	14
Tablecloth Restaurants	5	5
Plaza Express	4	24

Tripadvisor's Popularity Ranking, through an algorithm, is based on the quality, quantity, and currency of the opinions that a business receives from the users and the consistency of those opinions over time [49]; therefore, the greater the number of positive opinions, the better the position in the ranking.

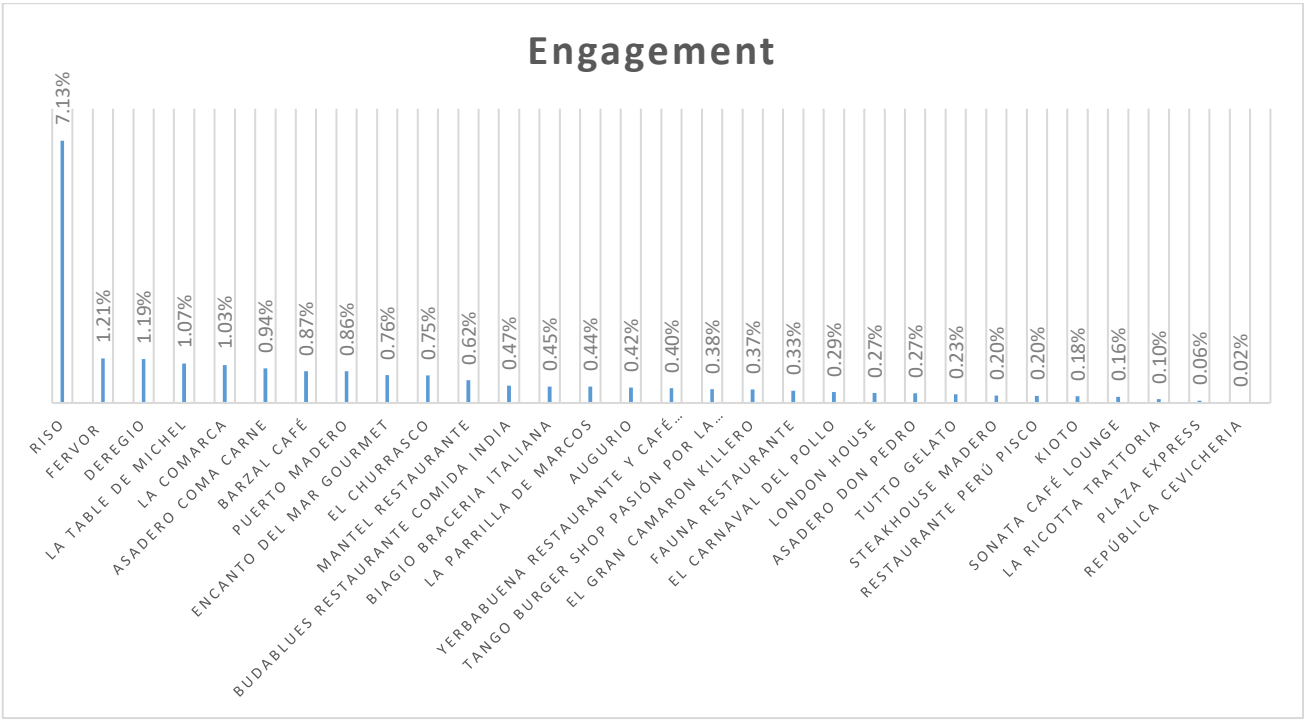

Figure 2.
Engagement results of the restaurants on social networks.

We immediately obtained social media data from the restaurants, and the engagement formula was applied to present a homogeneous level of engagement, except for Riso, which occupied the first place on the list. This restaurant was highlighted as an atypical case because it had a minor number of publications, but its achievements generated a greater number of interactions in comparison with the others. In addition, the average of each was calculated. This item is related to content generation on social networks. These location measures were used to provide the quantitative analytical values that represented the central location or some other characteristic of the data in the sample. A fundamental and very important measure useful in this context was the meaning of the sample, which was defined as an average numeric value of the collected data [50].

Table 5.
Average data of restaurants on networks.

# Facebook Posts	# Instagram Posts	Likes	Reactions	Facebook Comments	Instagram Comments	Shared	Facebook Followers	Instagram followers
29	61	2186	645	33	331	144	6370	4341

Calculating the average of the data on social networks had as its aim to determine, yeah, those Restaurants that exceeded the average were the same ones that were among those with the best engagement, that is, if there existed a descriptive relationship between both factors.

Those restaurants that outperformed the average in publications on Facebook were Puerto Madero, La Parrilla de Marcos, Fervor, Asadero Don Pedro, El Churrasco, Steak House Madero, Sonata, Biagio, and Plaza Express. On Instagram, they surpassed the average: Augurio, La Table de Michel, Encanto del Mar, Puerto Madero, La Parrilla de Marcos, Fervor, London, Barzal, De Regio, Don Pedro, Buda Blues, El Churrasco, Steak House Madero, Biagio, El Camarón Killero, and Plaza Express. As for the likes on Instagram, they exceeded the average: Augurio, La Table de Michel, Encanto del Mar, La Parrilla de Marcos, Kioto, Fervor, London, Barzal, De Regio, Don Pedro, Buda Blues, El Churrasco, Steak House Madero, and El Camarón Killero. Regarding the reactions on Facebook, the following restaurants surpassed the average: Fervor, Asadero Don Pedro, and El Churrasco. Regarding the comments on Facebook, the following restaurants surpassed the average: Fervor, Asadero Don Pedro, and El Churrasco. As for the comments on Instagram, the following outperformed the average: Augurio, Fervor, Asadero Don Pedro, and El Churrasco. Finally, as far as shares are concerned, on Facebook, the following restaurants outperformed the average: Fervor, Asadero Don Pedro, and Sonata.

To assess the relationship between some key indicators, correlation coefficients were applied. These coefficients measure the strength of the linear relationship between two variables, taking into account their units of measurement and expressing the deviation in standard deviation terms.

It is important to highlight that the sample correlation coefficient is simply the quotient between the covariance sample and the standard deviation sample of each variable. The correlation coefficient sample, except independent of the unit, is a measure of a variable, which is characterized by taking the value in an interval closed $-1 \leq r \leq 1$ or equivalently: $| r | \leq 1$

Interpretation of the correlation coefficient sample depends on the value and the sign that is taken and analyzes the characteristics of the sample. For now, assume that the number of observations in the sample (sample size) is like this, as the sample that is representative presents the same characteristics of the population. Therefore, the conclusions that can be drawn from the analysis of the correlation coefficients are valid for the general relationship.

A correlation coefficient with an absolute value very close to 1 indicates that the relationship between the variables is very strong, and if it is very close to zero, it indicates that the relationship is very weak [38].

Next, we obtain correlation data of some indicators that are of great importance:

Table 6.
Correlation coefficient of social network indicators.

Correlation	Results
Likes - Post	0.83
Likes - Followers	0.48
Likes /Post Ratio	0.25
Likes /Followers Ratio	0.17
Followers/ Engagement	-0.2

Below are the results of the TAI applied to the five restaurants with the best engagement:

Table 7.
Results TAI.

Restaurant	TAI
Michel's Table	-0.04
The Shire	0.06
Ricotta	0.02
Kyoto	0.06
Fervor Restaurant	0.03
DeRegio	0.02
Cevicheria Republic	0.21
Sonata Café Lounge	-0.04
Riso	0.21
Plaza Express	0.03

Researchers who are familiar with the Implicit test often use an algorithm acquaintance like TAI-D, which is related to Cohen's d. This metric allows measure the difference in the reaction rates of each participant in milliseconds during the tests in the blocks critics. Cohen's d dimensions he effects size as a standardized mean difference [51].

There is a slight association between Riso and positive and between Republica Cevichería and negative; a slight association between Fervor and positive and between Plaza Express and negative; a slight association between Deregio and positive and between La Ricotta and negative; a slight association between La Comarca and positive and between Kyoto and negative; association light between Michel's Table and sonata, in this, In this case, it must be noted that when a result is given negative, the association between these two is inverse, that is the users associate sonata in a way positive while the Table de Michel is negatively associated [52].

We proceed immediately to obtain the relationship between engagement and the TAI results with the data in the following table through a linear regression:

Table 8.
Engagement and TAI results.

Restaurant	TAI	Engagement
Michel's Table	-0.04	0.0107
The Shire	0.06	0.0103
Ricotta	0.02	0.0010
Kyoto	0.06	0.06
Fervor Restaurant	0.03	0.03
DeRegio	0.02	0.02
Cevicheria Republic	0.21	0.21
Sonata Café Lounge	-0.04	0.0016
Riso	0.21	0.0713
Plaza Express	0.03	0.0006

Table 9.
Engagement results for each social network and TAI.

Restaurant	Facebook Engagement	Instagram Engagement	TAI
Michel's Table	0.0059	0.0156	-0.04
The Shire	0.0004	0.0203	0.06
Ricotta	0.0000	0.0021	0.02
Kyoto	0.0008	0.0029	0.06
Fervor Restaurant	0.0158	0.0084	0.03
DeRegio	0.0005	0.0233	0.02
Cevicheria Republic	0.0000	0.0004	0.21
Sonata Café Lounge	0.0017	0.0015	-0.04
Riso	0.1387	0.0038	0.21
Plaza Express	0.0002	0.0010	0.03

Linear regression is an analysis of the relationship between X and Y that requires the approach of a model statistician. A statistician often uses a model as a representation of an ideal that, in essence, defines how we perceive the system in question and the gender of the data. The model must include the data set that involves n pairs of (x, y) values. We should not forget that the value of y I depends on x I by means of a linear structure that also includes the random component. The basis for the use of a model statistician relates to the way in which the random variable Y changes with X and the component random variables. The model also includes what is assumed to be the properties component statistics randomly. The model statistic for simple linear regression is presented below.

The graphics are intended to show the relationship statistics through linear regression between the average engagement and TAI results, Facebook engagement and TAI, and Instagram engagement and TAI, which will be analyzed in the conclusions section.

Table 10.
Identification of restaurants in the graph.

Nomenclature	Restaurant
n1	Riso
n2	Fervor Restaurant
n3	DeRegio
n4	Michel's Table
n5	The Shire
n6	Kyoto
n7	Sonata Café Lounge
n8	Ricotta
n9	Plaza Express
n10	Cevicheria Republic

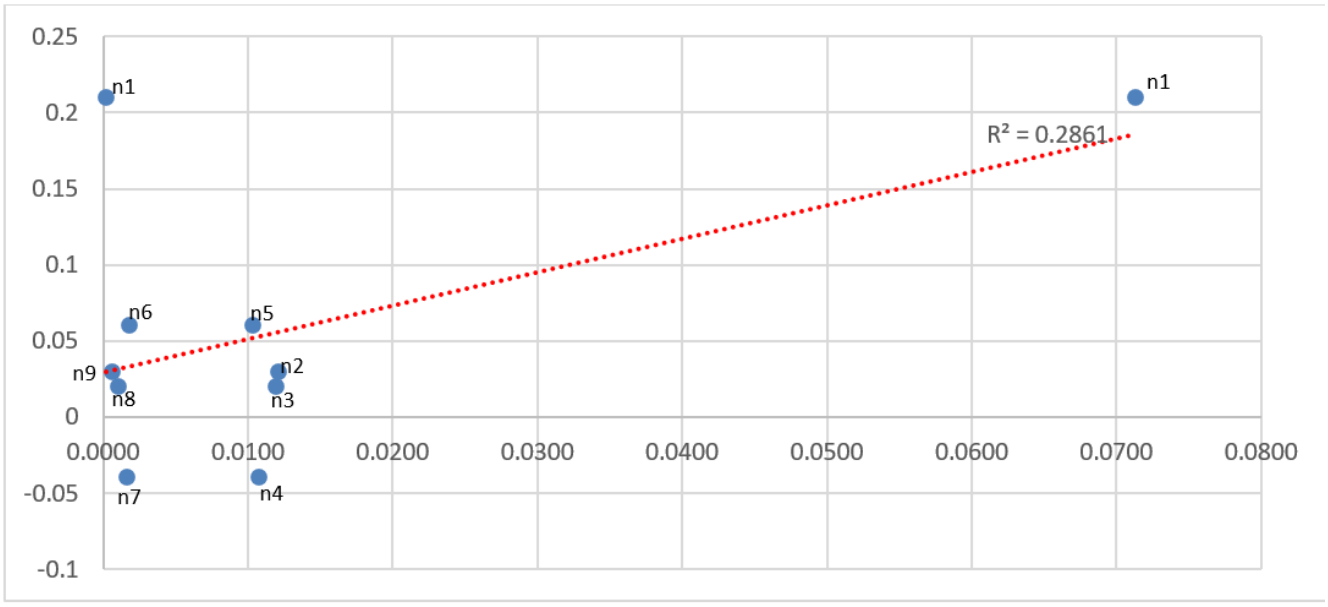

Figure 3.
Average linear regression Engagement and TAI.

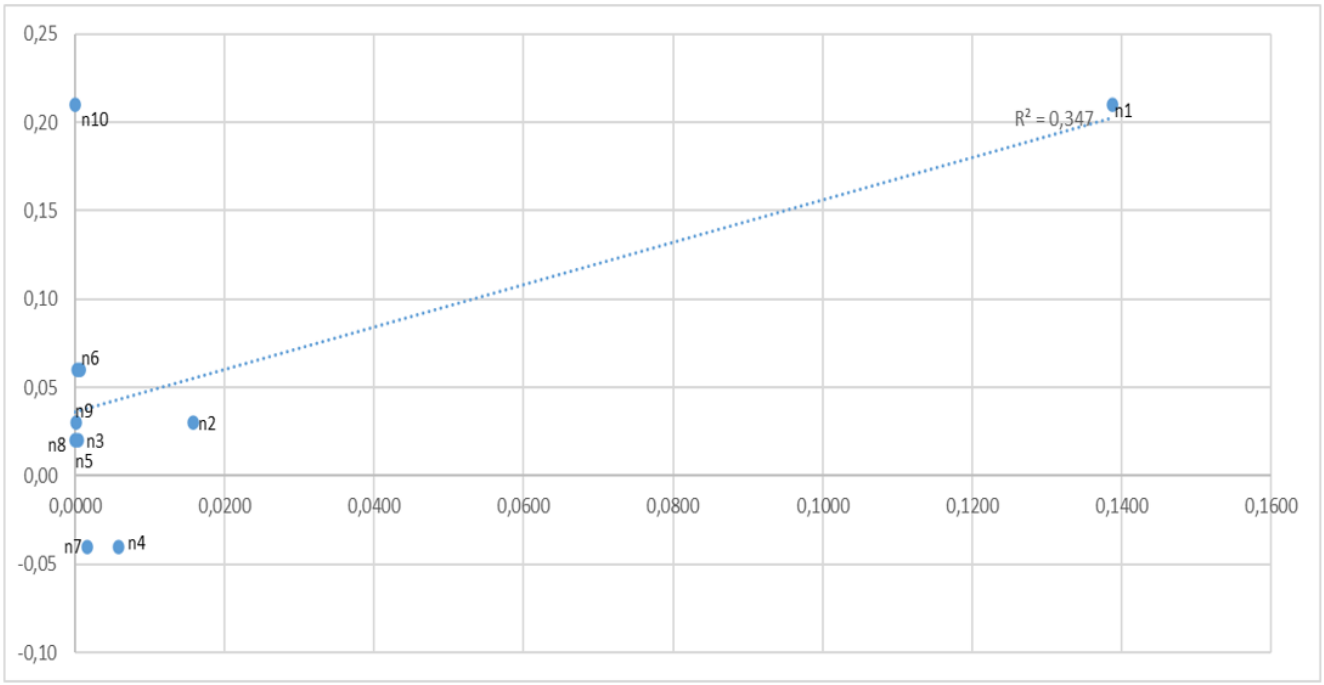

Figure 4.
Linear regression of Facebook engagement and TAI.

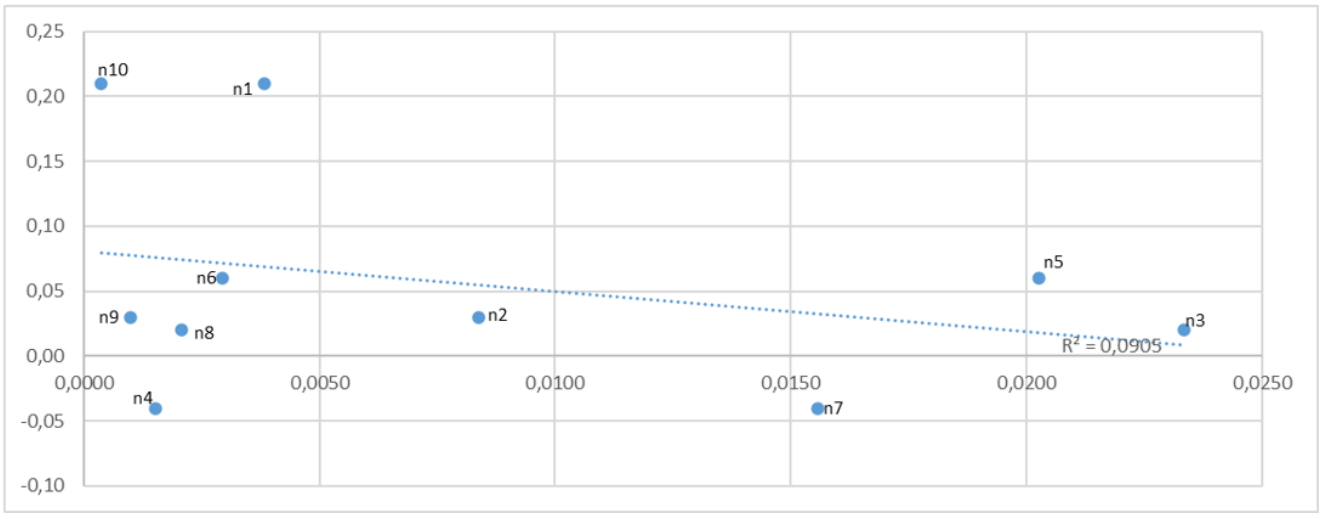

Figure 5.
Linear regression of Instagram engagement and TAI.

4. Conclusions

It is relevant to note that of the restaurants that outperform the average posting on Facebook, only Fervor is among those with the best engagement. In contrast, those who exceed the average number of posts on Instagram, such as La Table De Michel, Fervor, and Deregio, are among the best in terms of engagement. When it comes to Instagram likes, restaurants like La Table De Michel, Kyoto, and Fervor stand out among the best. Furthermore, it is observed that only Fervor is among the best in reactions and comments on Facebook, which suggests a relationship between these two metrics. On the other hand, in the comments on Instagram, Fervor stands out in the relationship obtained from the restaurants with the best engagement. Regarding the average number of shares on Facebook, Fervor stands out again, while in the average number of followers on this social network, La Comarca and Deregio are notable, but Plaza Express is among the worst engagement results. On average, the number of followers on Instagram, La Ricotta, and Plaza Express stands out, although Plaza Express has the worst engagement results, while Kyoto and Fervor are among the best in terms of followers on Instagram.

This leads us to consider that those restaurants with the best results in the indicators do not always have better engagement. It should be noted that to achieve a high percentage of engagement, it is essential that the public following the restaurants on social networks is active. This means that if a restaurant has more followers, some of these followers are expected to engage in greater activity with each of the publications. Although the relationship between likes and publications yields a correlation coefficient (r) of 0.83, indicating a positive relationship, it is necessary to point out that the number of

followers plays a significant role in engagement. This is evident in the relationship between likes, followers, and engagement, which has a correlation coefficient (r) of 0.48, suggesting that as the number of followers increases, the number of likes on the posts also increases. An example of this is the Fervor restaurant, which stands out in most of the indicators, especially in terms of followers and likes on each one of the networks. The case of Riso, which occupies the first place in engagement, is curious since despite not standing out in any of the indicators, it was observed that in the few publications that it has, the activity of its followers is very high. This highlights the importance of interaction and participation of followers on social networks. In addition, it is noted that Riso has one of the lowest numbers of further publications in comparison with the other restaurants.

The importance of likes, posts, and engagement is confirmed by the correlation between them. For example, the correlation between the number of posts and engagement is r = 0.25, while the correlation between likes, followers, and engagement is r = 0.17. Although these correlation coefficients are not very high, they are representative of the behavior of the users digitally on social networks. It should be noted that a low correlation coefficient does not necessarily mean that there is no relationship between the variables, but this relationship can be more complex or non-linear. Lahura [38] and this same ratify the result of the followers and engagement, which is r= -0.20. What you want to say is that at least the number of followers means greater engagement, although this happens if the followers have participated actively, as in the case of Fervor and Riso.

As for the results obtained through the TAI, it is observed that Riso, which has the highest engagement, and Republica Cevichería, which has the lowest engagement, show a positive and negative association, respectively. However, in all the restaurant pairs, this association is mild according to the TAI results. The result of the linear regression, which analyzes the data on social media engagement and the TAI, yielded a correlation coefficient (r) of 0.29. Although this value is not particularly high, it is statistically significant. This is important because a low correlation does not necessarily indicate a lack of association, since this can be strong but not necessarily linear, as Dagnino [53] points out. In other words, although the correlation is slight, it is important to highlight that there is a relationship between the behavior of the users on social media and their attitude toward the restaurants and images presented in the TAI.

It is also evident that more engagement is generated on Instagram than on Facebook. This is due to the greater participation of the followers in this social network since the users feel attracted by its visual appeal and ease of use on mobile phone devices, since 54 % of Colombians use their mobile phones to access their social networks [54]. For this reason, it is recommended to continue with the content strategy on Instagram and increase efforts on Facebook to improve engagement in this social network since the individual's attitude and interaction with Facebook show a relationship as reflected in the Linear regression results of Facebook and TAI engagement variables r=0.39, while the engagement relationship of Instagram and TAI is r=0.12; therefore, it is substantial carry out older efforts on Facebook to improve the results.

It is essential to have in mind that the evidence of this study was carried out according to the availability of time of the participants. Therefore, it was not possible to check the state of appetite of the subjects during evaluations, which could have implicitly influenced their responses and, consequently, the results. Since most of the images evaluated were related to food and considering the variations in personal tastes, we should consider the possibility of carrying out future research themes focused on different types of restaurants (Italian, Asian, French, seafood, etc.).

In summary, based on the limitations and considerations presented in this study, it is suggested that research focus on the implementation of in-depth interviews, the incorporation of neuromarketing tools such as facial coding and eye tracking, and conducting thematic studies by restaurant categories. These strategies will allow for a deeper and richer comprehension of the preferences of users in the context of restaurant advertising and promotion.

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