

Article

Decoding Preferences: A Comparative Analysis of Non-Alcoholic and Alcoholic Cocktails through Acceptance and Qualitative Insights

María Mora ^{1,2,*} , Elena Romeo-Arroyo ¹ , Francisco José Pérez-Elortondo ³ , Iñaki Etaio ³ and Laura Vázquez-Araújo ^{1,2} 

¹ BCC Innovation, Technology Center in Gastronomy, Basque Culinary Center, 20009 Donostia-San Sebastián, Spain; eromeo@bculinary.com (E.R.-A.); lvazquez@bculinary.com (L.V.-A.)

² Basque Culinary Center, Faculty of Gastronomic Sciences, Mondragon Unibersitatea, 20009 Donostia-San Sebastián, Spain

³ Laboratorio de Análisis Sensorial Euskal Herriko Unibertsitatea (LASEHU), Lactiker Research Group, Centro de Investigación Lascaray Ikergunea, Universidad del País Vasco/Euskal Herriko Unibertsitatea (UPV/EHU), Avenida Miguel de Unamuno 3, 01006 Vitoria-Gasteiz, Spain; franciscojose.perez@ehu.eus (F.J.P.-E.); inaki.etaio@ehu.eus (I.E.)

* Correspondence: mmora@bculinary.com

Abstract: This study aimed to evaluate consumer perception and acceptance of non-alcoholic cocktails compared to their traditional alcoholic counterparts in a restaurant setting. Three popular cocktails—gintonic, mojito, and mule—and their non-alcoholic versions (NoLo) were assessed following a three × two experimental design. A total of 600 participants (approximately 100 per cocktail) participated at the Basque Culinary Center’s restaurant. Participants rated their liking of the cocktails using a nine-point hedonic scale and provided open-ended responses about the sensory characteristics and the consumption contexts or emotions evoked by the different cocktails. The results showed differences in the acceptance of the six cocktails, but no significant differences between the alcoholic and non-alcoholic versions, suggesting that NoLo alternatives were similarly well-received. Open-ended responses were analyzed using latent dirichlet allocation (LDA) to uncover latent topics, and Fisher’s exact test and correspondence analysis were used to identify differences in the mentioned topics per cocktail. Specific sensory attributes, emotions, and contexts were associated with each type of cocktail, but no differences were found between the alcoholic and non-alcoholic versions. These findings demonstrate the viability of non-alcoholic cocktails in real consumption settings, eliciting similar liking scores, sensory attributes, contexts, and emotions in consumers. This study also highlighted the potential of natural language processing techniques for analyzing open-ended questions.

Keywords: consumer perception; real context; natural language processing; latent dirichlet allocation



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1. Introduction

Alcohol is defined as a toxic and psychoactive substance that leads to dependence among consumers [1]. The epidemiological study conducted by Klatsky et al. [2] revealed a J-shaped relationship between alcohol consumption and mortality, with rates increasing among heavy drinkers and decreasing among moderate drinkers.

The World Health Organization (WHO) reported a decrease in alcohol consumption in European regions between 2000 and 2019 [1]. A similar trend was observed in the UK during the COVID pandemic; one-third of adults had decreased alcohol consumption in 2019 in the UK from the previous year and, by 2020, almost 20% of those who cut back in 2019 had made this a permanent lifestyle change [3]. Kraus et al. [4] suggested that the decline in alcohol consumption could be attributed to a growing awareness of health risks, as well as changes in technology, social norms, family relationships, and gender identity.

However, despite the rise of a segment of consumers prioritizing health, the evidence shows that consumers remain unwilling to sacrifice pleasure for health benefits [5].

These shifts in consumption patterns and behaviors have driven the alcohol industry to innovate within the beverage sector [6]. Anderson et al. [7] and Hagemann et al. [8] highlighted a growing interest in beverages with reduced alcohol content, including beer, wine, spirits, and cocktails. NoLo alcohol products, defined as beverages that traditionally contain ethanol but are manufactured with significantly reduced or completely removed ethanol content, exemplifies this trend [9]. Several studies have focused on consumer perceptions and behaviors toward NoLo drinks. A systematic review of NoLo drinks consumption conducted by Waehning and Wells [10] analyzed 60 such studies. Most of these investigations were on beer (63%), followed by wine (15%), and a combination of beer and wine (13%). A single publication was identified comparing spirits versus NoLo spirits, focusing on how the ethanol concentration affects the sensory perception of aged rums using a trained panel [11]. To the authors' knowledge, consumer perception of NoLo cocktails vs. traditional cocktails has not been investigated yet.

Regarding social context, NoLo drinks could allow non-alcohol drinkers to integrate effortlessly into social scenarios involving alcohol without being perceived as "boring" or risking exclusion [12]. To thoroughly understand consumer perceptions of NoLo beverages and to assess if they can effectively take the place of their traditional alcoholic counterparts, Delarue et al. [13] suggested maintaining ecological validity by testing products under realistic (or immersive) conditions for more realistic results.

One of the main reasons to use open-ended questions is to decipher the reasons behind product liking [14]. Open-ended questions provide qualitative data that is difficult to code and tabulate [15]. Jaeger and Rasmussen [16] suggest employing text mining and natural language processing (NLP) techniques to analyze these responses. NLP automates language-related tasks such as machine translation, search engine result ranking, and speech recognition, among other applications [17]. Although this methodology has been widely used in multiple disciplines, it was first applied in the sensory field by Hamilton and Lahne [18] to automatically collect, clean, and analyze sensory data from the web to build a sensory descriptive lexicon. In the NLP, latent dirichlet allocation has been proposed as a method for topic modeling. It is a powerful technique for latent data discovery and for finding relationships among data in text documents [19]. This type of analysis, as shown by Buenano-Fernandez et al. [20], could be beneficial for analyzing open-ended questions.

The aim of this study was to evaluate consumers' hedonic responses and perceptions of non-alcoholic cocktails compared to their traditional alcoholic counterparts in a real restaurant setting. Additionally, this study sought to explore the contexts and emotions elicited by these beverages using open-ended responses to gain insights into the potential of non-alcoholic versions. For this purpose, a combination of a quantitative hedonic scale and qualitative data from open-ended questions was utilized. Qualitative responses were analyzed using natural language processing (NLP) techniques, enabling a detailed examination of the sensory attributes, consumption contexts, and emotional associations described by participants.

2. Materials and Methods

2.1. Sample Selection

Three types of cocktails were selected for the present study: gintonic, mojito, and mule. These cocktails were chosen for their popularity and the potential to be reproduced in both traditional and NoLo versions, given the availability of non-alcoholic distillates on the market. The selection was the outcome of collaborative discussion sessions among the sensory analysis research team, the culinary team, and the LABe Restaurant (Donostia-San Sebastián, Spain) service team.

The cocktails were prepared following the same procedures for both traditional and NoLo versions by the LABe Restaurant service team (Table 1). Special attention was given to maintaining a consistent serving temperature (spirits 15 °C ± 5; mixers 4 °C ± 5) and

presentation to ensure the preservation of sensory properties throughout the study. Besides the alcoholic sensation, a trained panel confirmed that the traditional and NoLo versions were similar in terms of sensory characteristics. To ensure good practices and ease of preparation, each cocktail was randomly assigned to a specific experiment day.

Table 1. Description of the ingredients and the preparation procedure of the samples.

Cocktail	Units	Ingredient	Procedure
Gintonic with or without alcohol	5 cl	gin with/without alcohol	<ol style="list-style-type: none"> 1. In a 250 mL balloon glass add ice cubes until one cm below the rim of the glass. 2. Add the distilled spirit with or without alcohol. 3. Add tonic until one cm below the rim of the glass. 4. Add the lime twist and stir the gin tonic with a bar spoon.
	qs	tonic	
	1 twist	lime	
	qs	ice	
Mojito with or without alcohol	12 leaves	mint	<ol style="list-style-type: none"> 1. In a slightly wide 250 mL glass, place mint leaves, sugar, and lime quarters at the bottom of the glass in this order. 2. Lightly muddle the leaves and sugar with a muddler. 3. Add the distilled spirit with or without alcohol. 4. Add crushed ice until one cm below the rim of the glass. 5. Add soda until one cm below the rim of the glass. 6. Decorate with two straws and the mint sprig. 7. Stir the mojito with the straws twice before serving.
	15 g	sugar	
	4 quarters	lime	
	5 cl	rum with/without alcohol	
	qs	soda	
	qs	crushed ice	
	2	straws	
1	mint sprig		
Mule with or without alcohol	3 cl	lime juice	<ol style="list-style-type: none"> 1. In a special copper mug for mules, add lime juice, ginger syrup, and the distilled spirit with or without alcohol. 2. Add crushed ice until one cm below the rim of the glass. 3. Add ginger beer until one cm below the rim of the glass.
	1 cl	ginger syrup	
	5 cl	gin with/without alcohol	
	qs	ginger beer	
	qs	crushed ice	
1	straw		

Note: qs stands for “quantity sufficient” which indicates it used as much of the ingredient as needed.

2.2. Participants

Consumers were recruited from the BCC Innovation consumer database through mailing and social networks. The social networks of the LABe Restaurant in Donostia-San Sebastián, Spain—the location where the study was conducted in a real consumption situation—were also used. Participants were healthy adults willing to try different cocktails. They should be occasional cocktail drinkers (at least 1 per month) and residents of Donostia-San Sebastián at least for the last three years. Upon arrival at the LABe restaurant, this information was verified, and participants were given the option to participate once they had eaten, ensuring they were in similar physiological states and conditions.

Over 650 participants were recruited and took part in the study. A total of 610 valid responses were obtained after discarding incomplete or deficient questionnaires: 105 belonged to the gintonic group, 101 to the NoLo gintonic group, 106 to the mojito group, 99 to the NoLo mojito group, 100 to the mule group, and 99 to the NoLo mule group. The average age was 40.7 (SD = 13.7), and the gender distribution was 37% men, 58% women, 3% non-binary, and 2% of consumers choosing the “prefer not to disclose/other” option.

2.3. Procedure

This study was conducted at the LABe Restaurant, a restaurant with belongs to Basque Culinary Center and which is in the city center. Customers were invited to participate in the study after eating at the restaurant, because these kinds of beverages are typically consumed after lunch time in Spain. Once participants confirmed that they met the screening criteria and their willingness to participate in the study, one of the cocktails was served. Consumers were not informed about the objective of the project or about the possibility of receiving a NoLo cocktail. They were asked to taste the cocktails as they usually do and fill out a questionnaire. After tasting, they were given a QR code that linked to the questionnaire. The questionnaire included two sections: a first section with three questions about the sample, and a second section recording sociodemographic data. The first section included:

(1) an acceptance question using a 9-point hedonic scale (1 = dislike extremely; 9 = like extremely); (2) an open-ended question regarding the sensory characteristics they identified in the tasted cocktail; and (3) another open-ended question about the consumption contexts and emotions evoked by the beverage. The sociodemographic section gathered information about the participants' gender, age, city of residence for the past three years, and their cocktail consumption frequency. Data collection was performed using RedJade[®] software v.5.1.1 (RedJade Sensory Solutions, LLC, Palo Alto, CA, USA).

The protocol and procedures used in this study were approved by the ethic committee of Mondragon Unibertsitatea (IEB-20221115); an informed consent confirming voluntary participation was collected from each participant before starting the study. All articles from the Declaration of Helsinki and the 2016/679 EU Regulation on the protection of natural persons regarding the processing of personal data and on the free movement of such data were met.

2.4. Data Analysis

A one-way analysis of variance (ANOVA) followed by a post hoc Tukey's HSD test was carried out on the hedonic response, using the type of cocktail as a fixed factor. Differences were considered significant at p -value < 0.05 unless otherwise stated. XLSTAT (XLSTAT Version 2021.5, Addinsoft, Paris, France) was used for this analysis.

Open-ended responses from the sensory characteristics and the contexts/emotions questions were analyzed using natural language processing (NLP). The latent dirichlet allocation (LDA) statistical model was applied to discover latent topics within the collection of responses from consumers for each cocktail. LDA provided a set of topics that best represented the data, along with each topic's contribution to each cocktail. Heat maps were used to visualize the results of the LDA analysis. The explained analysis was programmed in Jupyter Notebook version 7.1.2 [21] using Python 3.12.2 (Wilmington, DE, USA). The Python libraries used for the NLP workflow were Pandas (for data manipulation and analysis), NumPy (for numerical computing), spaCy (for advanced natural language processing), CountVectorizer and LatentDirichletAllocation from scikit-learn (for text vectorization and topic modeling, respectively), matplotlib.pyplot (for data visualization through the heatmaps), and seaborn (for statistical data visualization). SpaCy version 3.7.4, with the Spanish model `es_core_news_sm` version 3.7.0, was specifically used for text preprocessing, which simplified the process of tokenizing the input text and filtering out stopwords and punctuation to obtain clean tokens.

After extracting tokens and conducting LDA, the data were transformed into a matrix with tokens/items in columns and each consumer comment per type of beverage in rows. This matrix showed the presence of a token in a comment giving a value of 1 and its absence giving a value of 0, transforming the qualitative comments into a binary matrix. The resulting matrix was analyzed using a Fisher's exact test, and a correspondence analysis to examine the relationship between the tokens/items and the beverages. Differences were considered significant with Fisher's exact test at p -values of < 0.05 . These statistical analyses were performed using XLSTAT (XLSTAT Version 2021.5, Addinsoft, Paris, France).

3. Results

Significant differences in hedonic responses were found among the six cocktails evaluated (p -value < 0.05), with mule being the one with the higher scores for liking and gintonic NoLo the one with the lowest scores for liking (Table 2). When examining the results of the Tukey's HSD post hoc test for each type of cocktail, no differences were found between the traditional and their NoLo versions, suggesting that consumers similarly liked the traditional beverages and their alcohol-reduced counterparts.

The LDA analysis of the question about perceived sensory characteristics identified 10 latent topics across the entire collection of comments (Figure 1). While most topics reflected sensory properties, others incorporated specific consumption situations, emotions, or natural elements to describe the flavor of the samples. Examples of these non-sensory

descriptors include phrases like “tastes like summer”, “happy and fresh drink”, “exotic flavor”, and “reminds me of a sea breeze”, among others (Figure 1a). Figure 1b presents a heatmap that intersects the information from the 10 latent topics with the different samples, showing the topics associated with each type of cocktail. The latent topics that effectively described each pair of cocktails were topics 3, 5, 7, and 8. Topic 7 served as a clear descriptor of gintonic, topic 5 for mojito, and topics 3 and 8 for mule. Topics 6, 9, and 10 were highly mentioned across all samples, highlighting the refreshing, acidic, sweet, and carbonated character of cocktails. The presence of topics 1, 2, and 4 were minimally relevant compared to the other topics.

Table 2. ANOVA results of hedonic responses for the different cocktails.

Sample	Liking
Gintonic	6.762 abc
Gintonic NoLo	6.079 c
Mojito	6.443 bc
Mojito NoLo	6.879 ab
Mule	7.300 a
Mule NoLo	6.899 ab
<i>p</i> -value	<0.0001

Note: Different letters indicate different post hoc groupings by Tukey’s HSD ($p < 0.05$).

The results from the LDA analysis on the comments relating to the contexts and emotions elicited by the beverages are shown in Figure 2. Again, 10 latent topics were detected (Figure 2a). Most of the topics were associated with social moments with friends, holidays, and positive emotions. Topics 5, 7, and 9 involved items indicative of leisure dining or mealtime environments such as “terrace”, “table” or “meal”. Topics 2, 4 and 10 reflected social gatherings in the evening or nighttime (e.g., “party”, “evening”). Topic 3 was predominantly characterized by “beach” and “tropical” settings, although it shared some items with other topics, such as “holidays”. Topics 6 and 8 evoked feelings of “calm” and “relaxation” and contexts such as “natural surroundings”. Finally, topic 1 was associated with feelings of “nostalgia”. The heatmap indicated that no specific topics were exclusively associated with any particular cocktail (Figure 2b). However, topic 3 showed a link between items related to holidays and tropical settings with mule cocktails. Topics 7 and 9 were the most frequently mentioned across the samples, grouping together comments that evoked that the drinks tasted were leisurely enjoyed post meal and in social settings with friends.

A total of 140 items were extracted from the open-ended questions after conducting the NLP process: 53 items from the sensory characteristics question and 87 items from the contexts and emotions question. The *p*-value of the Fisher’s exact test for both data sets was <0.0001, indicating a significant link between the cocktails and the tokens/items. Tables 3 and 4 present the results of the significance by cell for those tokens/items that exhibited significant differences between the theoretical and actual values among beverages.

Significant differences were found in the items from the open-ended questions related to sensory attributes between each pair of cocktails (Table 3). In the gintonic pair, the traditional version was significantly more often described with items like “fruity”, “botanical”, “tasty”, and “smooth”, while the NoLo version elicited significantly higher mentions of “cardamom” and “gin”. For the mojito pair, the traditional version was associated with terms such as “acid”, “pineapple”, “caipirinha”, “rum”, and “whiskey”, but was also described as “tasteless”. In contrast, the NoLo version was labeled as “watery”, with flavors of “sweet”/“sugar” and “peach”, and was also compared to “kombucha”. In the mule pair, the item “exotic” was significantly more often mentioned for the traditional version than the NoLo version. Items like “watery”, “sweet”/“sugar”, “gas”, “mint”, and “smooth” were mentioned less frequently for the traditional version compared to the NoLo version.

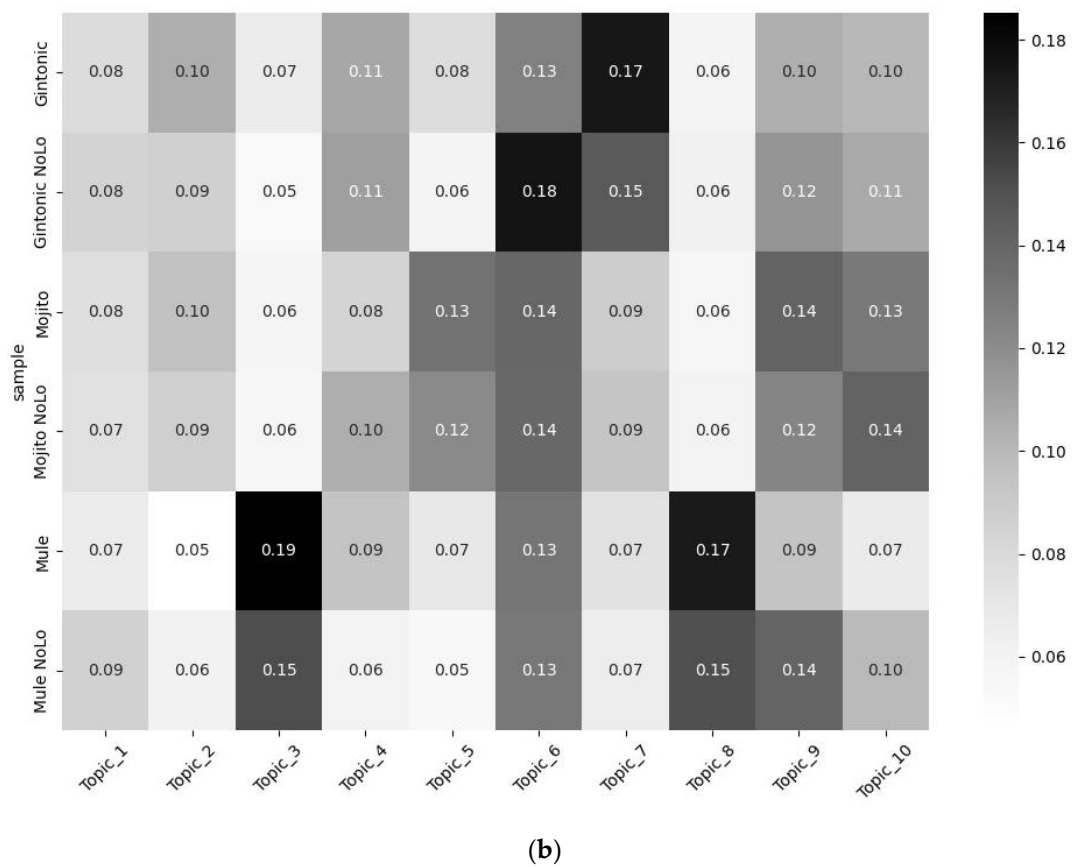
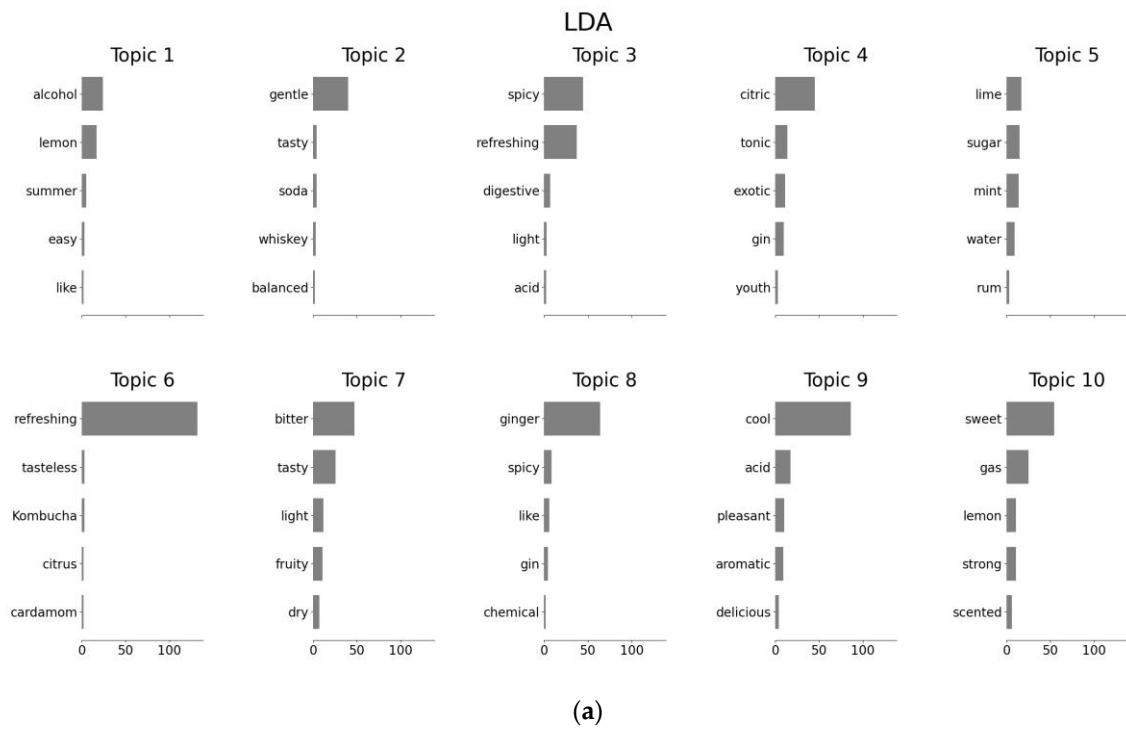
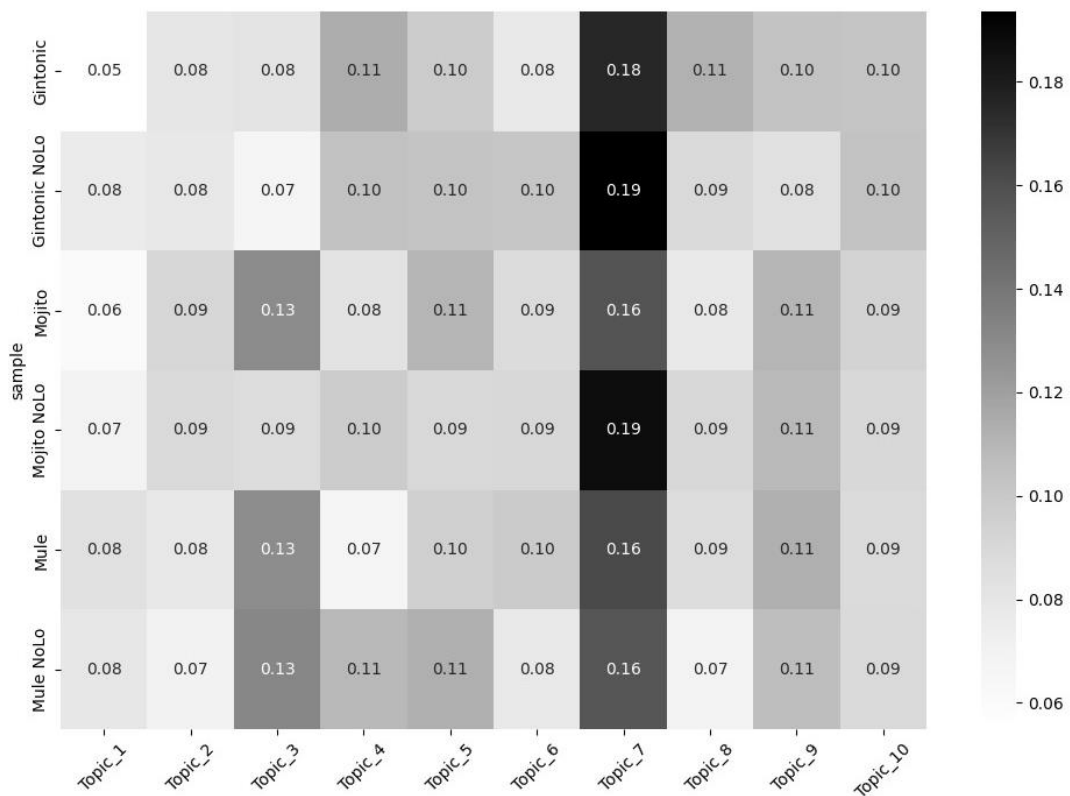
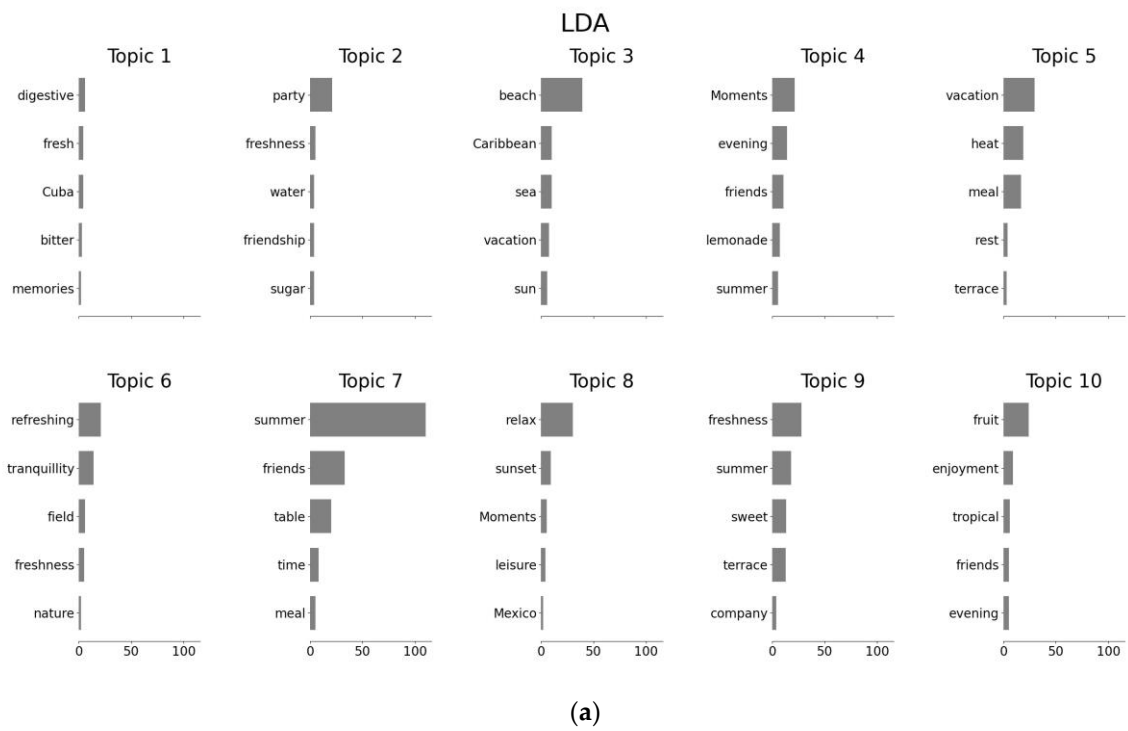


Figure 1. Latent topics identified from the open-ended question on sensory characteristics. (a) Ten latent topics with their respective items and citation frequency extracted from LDA analysis. (b) Heatmap of the association between the latent topics and the assessed cocktails.



(b)

Figure 2. Topics identified from the open-ended question on contexts and emotions evoked by the cocktails. **(a)** Ten latent topics with their respective items and citation frequency extracted from LDA analysis. **(b)** Heatmap of the association between the latent topics and the assessed cocktails.

Table 3. Significance by cell provided by the Fisher’s exact test of the attributes related to sensory characteristics mentioned by consumers among cocktails that exhibited significant differences between the theoretical and actual values. Values displayed in red are significant at the alpha = 0.05 level.

	Gintonic	Gintonic NoLo	Mojito	Mojito NoLo	Mule	Mule NoLo
acid	<	<	>	>	<	>
fruity	>	>	<	<	<	<
watery	<	<	>	>	<	<
bitter	>	>	>	<	<	<
sugar	<	<	>	>	<	<
botanical	>	<	<	<	<	<
caipirinha	<	<	>	<	<	<
cardamom	<	>	<	<	<	<
sweet	>	<	>	>	<	<
exotic	<	<	<	>	>	<
gas	>	<	>	>	<	>
gin	>	>	<	<	>	<
tasteless	<	<	>	<	<	<
ginger	<	<	>	<	>	>
kombucha	<	<	<	>	>	<
peach	<	<	>	>	<	<
mint	<	<	>	>	<	<
spicy	<	<	>	<	>	>
pineapple	<	<	>	<	<	<
tasty	>	>	<	>	<	<
rum	<	<	>	<	<	<
smooth	>	>	<	>	<	<
tonic	>	>	<	<	<	<
whiskey	<	<	>	<	<	<

Note: Each cell indicates if the actual value was lower (<) or higher (>) than the theoretical value.

Table 4. Significance by cell provided by the Fisher’s exact test of the attributes related to context and emotions elicited by consumers among cocktails that exhibited significant differences between the theoretical and actual values. Values displayed in red are significant at the alpha = 0.05 level.

	Gintonic	Gintonic NoLo	Mojito	Mojito NoLo	Mule	Mule NoLo
friends	>	>	<	<	<	<
countryside	<	<	<	<	>	<
chocolate	>	<	<	<	<	<
food	>	>	<	<	>	>
share	<	<	<	<	<	>
escapade	<	<	<	<	>	<
exotic	<	<	<	<	>	>
family	>	>	<	<	<	<
fantasy	>	<	<	<	<	<
syrup	<	<	<	<	<	>
lemon trees	<	>	<	<	<	<
Mexican	<	<	<	<	>	>
moments	>	>	<	<	<	<
orange trees	<	>	<	<	<	<
paradisiacal	<	<	>	<	<	<
beach	<	<	>	>	<	>
meeting	>	<	<	<	<	>
laughter	<	>	>	<	<	<
dessert	>	>	<	<	<	<
calm	>	<	<	>	<	<
vacation	<	<	>	>	>	<
summer	<	<	>	>	>	>
green	<	<	<	>	<	<
juice	<	<	<	>	<	<

Note: Each cell indicates if the actual value was lower (<) or higher (>) than the theoretical value.

Table 4 shows the significant differences found in the items mentioned in the open-ended responses related to the contexts and emotions elicited by the cocktails’ consumption. The traditional gintonic cocktail elicited more mentions of concepts such as “chocolate”,

“food”, “family”, and “fantasy”, while the NoLo version was more associated with contexts like “lemon trees” and “orange trees”. In the mojito pair, the traditional version generated fewer items related to “food” compared to the NoLo alternative and was visualized in “paradisical” contexts, while the NoLo version was less associated with “friend” contexts. For the mule, the traditional alternative was more often visualized in contexts like “countryside”, “escapade”, and “Mexican”, and less associated with “friends” than the NoLo option. However, the NoLo alternative elicited higher frequencies of the “share” and “syrup” concepts.

The correspondence analysis (CA) was conducted on the significant items to explore the relationships among sensory attributes, contextual situations, and consumer-evoked emotions related to the cocktails. Figure 3 shows the first two principal components of the CA, including 76.54% of the data variance. Traditional and NoLo gintonic were related to sensory attributes including “botanical”, “cardamom”, “tonic”, “fruity”, and “bitter”; context/emotional items such as “family”, “friends”, “meeting”, and “calm”; and food categories such as “desserts”, “chocolate” as regular pairings. The traditional and NoLo versions of mojito were linked with sensory items such as “mint”, “green”, “pineapple”, “peach”, “sweet/sugar”, and some distillates, as well as context/emotional items such as “paradisical” or “laughter”. Traditional and NoLo mule evoked sensory attributes of “ginger”, “spicy”, and “syrup”, and were related to emotions and contexts described as “exotic”, “countryside”, or Mexico.

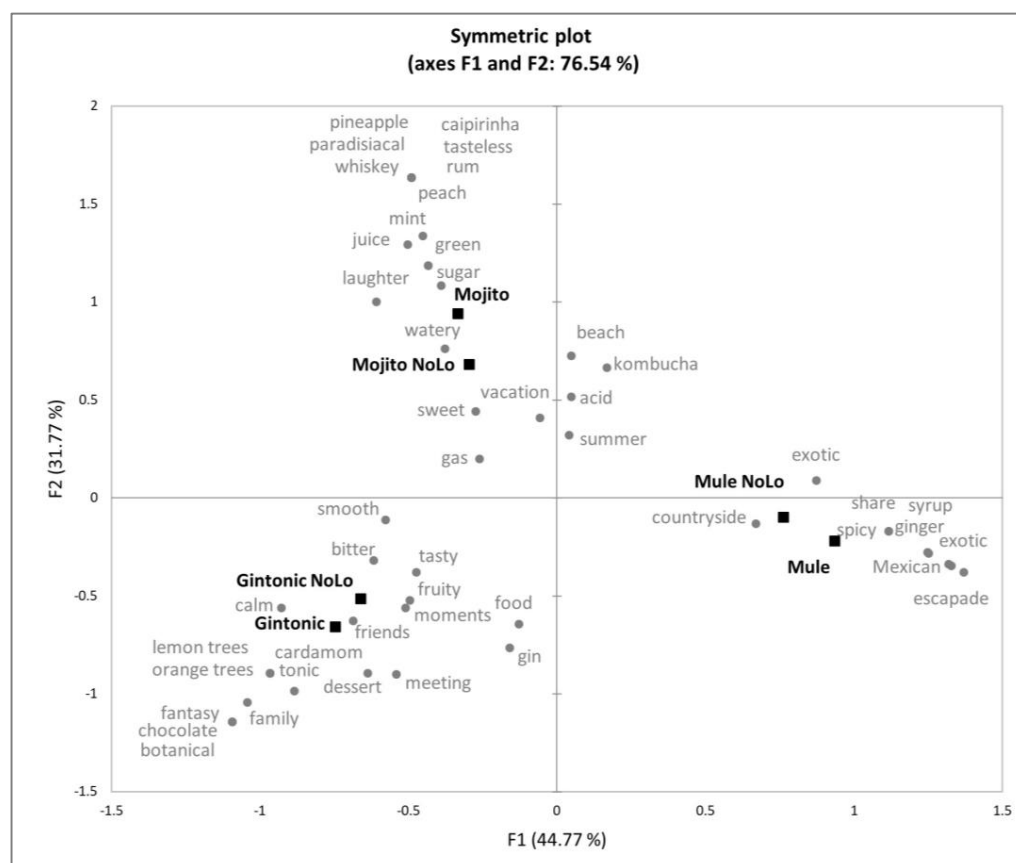


Figure 3. Symmetric plot of sensory attributes, contextual situations, and emotions related to traditional and NoLo cocktails.

4. Discussion

The present research delved into how consumers perceived and accepted NoLo versions of widely recognized cocktails in comparison to their traditional alcoholic counterparts in a real setting. Although significant differences were observed in the hedonic

responses to the six evaluated cocktails, post hoc analysis revealed that consumers did not show a preference for the traditional versions over the NoLo alternatives. This result is an interesting insight as it suggests that consumers are able to enjoy the non-alcoholic versions of the beverages with a hedonic perception of the experience that is comparable to their alcoholic counterparts. Naspetti et al. [22] and Smeets et al. [23] found similar results in studies also conducted with NoLo beverages. Naspetti et al. [22] found that participants were unable to discriminate in terms of liking between a non-alcoholic sparkling sweet wine and a 7.5% alcohol sparkling sweet wine in both blind and informed conditions. Smeets et al. [23] did not find differences in brain reward responses elicited by beers with and without alcohol when presented in a context where alcoholic beer is typically expected, indicating that flavor was the main driver of the consumption experience rather than the presence of alcohol.

It is well known that alcohol (or ethanol) significantly impacts the taste and mouthfeel of beverages [24]. It can influence bitterness, sourness, and sweetness [25] and affect mouth sensations such as astringency, pungency, cooling, and tingling [26]. Paixão et al. [27] reported that beers mostly preferred by consumers were those that contained alcohol in their formulation, highlighting the impact that alcohol reduction could have on the flavor and acceptance of NoLo beverages. However, flavor is a multidimensional sensation not affected by a single attribute such as alcohol content. Porretta and Donadini [28] suggested that the acceptability of NoLo beers could be influenced by color, taste, and body. This suggests that if the flavor (taste, body, and color) remains constant, acceptance remains unchanged. The results of the present research, based on consumer comments, indicated that the differences between pairs of cocktails were related to the lack of flavor and alcohol, as well as the exotic hints of the ingredients. Although these differences were significant, they did not negatively impact the liking of the NoLo versions. This similarity could be due to the flavor not being determined solely by the liquor used in the cocktail, but by multiple ingredients contributing to the overall flavor experience. These ingredients could have enhanced the taste of the beverage, masking the absence of alcohol.

The impact on consumers' perception of non-alcoholic cocktails compared to their traditional alternatives was also explored through open-ended questions. These questions yielded valuable insights into the drivers of preference for each assessed NoLo cocktail, including flavors, contexts, suitable food pairings, and emotions. Similar results were obtained by Spinelli et al. [29], who used open-ended questions to investigate the habitual consumption contexts of coffee. Their research not only pinpointed specific situational contexts, but also uncovered related factors such as flavors, emotions, and particular pairing moments or products. These results emphasized the importance of social and emotional contexts in consumer experiences, aligning with the food choice model proposed by Köster et al. [30], which highlights the influence of factors beyond the product itself, such as the consumption context, on product liking. Both studies demonstrated the comprehensive potential of open-ended questions to delve into the drivers of consumer preference.

Many studies have shown that NoLo beverages could serve as potential substitutes of alcoholic beverages for non-alcohol drinkers, facilitating social situations without compromising the drinking experience [31–34]. Correspondence analysis results showed the same contextual or emotional factors for each pair of traditional and NoLo versions of cocktails. Moss et al. [32] and Vasiljevic et al. [35] found that context plays an important role for beverages selection, noting that non-alcoholic drinks are often associated with lunchtimes, home, or social gatherings at someone's house, while low-alcohol drinks could be linked with parties, holidays, and celebrations. In the present study, no differences were found between the contexts elicited in the NoLo versions and their alcoholic counterparts. This corroborates the findings regarding the negligible differences in acceptance, emphasizing that NoLo versions serve as highly viable alternatives to alcoholic cocktails in terms of acceptability.

This study illustrates the complex interplay between acceptance, sensory properties, contextual factors, and emotional responses, shedding light on consumer preferences for

NoLo cocktails. The broad scope of this research establishes some insights to understand the subtle factors that influence these preferences. Future studies could explore specific sensory, emotional, and environmental factors that foster consumer acceptance across different consumer groups and cultures. Such research would enhance the insights gained and assist manufacturers in tailoring products that more effectively meet consumer tastes and needs. This could boost the development of non-alcoholic beverages, aligning product offerings more closely with consumer demands and expectations.

5. Conclusions

This study supported the viability of NoLo cocktails as alternatives to alcoholic counterparts in social and dinner settings, preserving consumer satisfaction in blinded conditions as evidenced by hedonic response results. The analysis of the open-ended questions about sensory attributes, alongside the contexts and emotions elicited during cocktail consumption, showed consistent results across both traditional and NoLo versions of each cocktail. Specifically, gintonic versions were described by consumers as botanical, cardamom, tonic, and bitter notes, often enjoyed in calming social settings such as family gatherings and meetings with friends. Mojito variants were characterized by flavors of mint, green, pineapple, and sugar, and were associated with paradisiacal settings and laughter. Mule variants evoked ginger and spiciness, often related to exotic and getaway experiences. These outcomes provided a comprehensive understanding of the factors influencing consumer preferences. The results suggest that the absence of alcohol did not significantly alter the overall sensory experience, indicating that factors beyond alcohol content, such as flavor complexity and social context, play a critical role in consumer satisfaction.

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