RESIDENTS' PERCEPTIONS AND ATTITUDES TOWARDS THE CRUISE TOURISM IMPACT IN GRAN CANARIA

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Abstract

This paper analyses the perceptions and attitudes of the residents of Las Palmas de Gran Canaria with respect to cruise tourism in Gran Canaria (Spain). We collected information on residents' perceptions and attitudes towards cruise tourism through a survey and we applied a Principal Component Analysis to obtain the explanatory variables (factors) in order to estimate a logit model to explain those perceptions and attitudes. The results show that residents' perceptions of cruise tourism have a positive effect from a socio-economic point of view. Regarding environmental effect, residents' perceptions are negative in terms of air pollution, marine pollution and accumulation of dirt, as might be expected. Finally, residents' perceptions of public policies that limit the development of cruise tourism are negative. This result seems to indicate that there is no need to limit the arrivals of cruise ships or to impose a touristic tax in Gran Canaria.

Policy implications are discussed and suggestions for further research are provided, including the need to study possible changes in perceptions due to the Covid-19 pandemic in 2020 that occurred after the completion of this work.

Keywords: Cruise tourism, Residents' perceptions, Residents' attitudes, Principal Component Analysis, Logit model, Las Palmas de Gran Canaria.

1. INTRODUCTION

The cruise industry has been enjoying an exponential growth since the 1970s when occurred its renaissance and the modern cruise industry began. This growth has been not only intense but also resilient. This has probably been one of the few industries that has managed to go through the previous international economic crisis by showing positive annual growth rates[1].

Indeed, from the traditional markets of the Caribbean, that can be considered the place where the modern cruise industry began, the activity in this sector has been expanding to other markets such as Europe and, more recently, Asia, to name but two (WTO, 2010; Pallis and Vaggelas, 2020). In all of them, the outline of a success is repeated: several brands belonging to a few corporations compete in different geographical areas and market segments.

These companies are associated in such a way that they manage to convey the idea that this industry offers an important source of benefits to the destinations they visit, in the form of the creation of VAT, jobs, etc.; through the regular publication of economic impact studies (CLIA, 2018ab). However, despite this important advertising and marketing effort, there are more and more critical voices that rise not only to question how much real benefit lies on the destinations (MacNeill & Wozniak, 2018 and Baños & Tovar, 2019) but also to point out the multiple negative effects that their presence also imposes, such as those derived from air pollution (Caric & Mackelworth, 2014; Tichavska & Tovar, 2017b and Tovar & Tichavska, 2019) or overload of public places (Tattara, 2014) to name a few. This is probably why it is becoming more prevalent in the industry for companies and associations to publish, along with economic impact reports, others of environmental sustainability and even corporate social responsibility (CLIA, 2017). However, as pointed up by Cheer (2016) independent community impact studies are needed to avoid reliance on inaccurate and unverified industry self-reports.

Although it is true that, for a certain segment of the industry, ships are increasingly becoming a destination in themselves, and that some companies are even becoming owner of some destinations (i.e private islands[2]) it is no less true that the industry needs destinations in order to be capable to continue existing and expanding (Gui & Russo, 2011). In fact, some ports are a maritime gateway to a must-see destination such as Civitavecchia to Roma, or the ports of Barcelona and Venice to these two high tourist attractive cities in the Mediterranean. Indeed, Barcelona and Venice that may receive several mega cruise ships that unload thousands of cruisers at the same time are already beginning to show the negative effects that can result from saturation and capacity overload[3].

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[1] Obviously, this has changed dramatically with the arrival of the Covid-19 pandemic in 2020, which has been an unprecedented blow to the cruise industry, with ship owners, tour operators and shipyards affected.

[2] Seven examples of cruise line private islands and who owns them can be found in https://www.cruisecritic.co.uk/articles.cfm?ID=1418.

[3] Barcelona's mayor has pledged to restrict the number of cruise ships allowed to dock in the city (https://www.theguardian.com/cities/2019/jul/05/barcelona-mayor-promises-crackdown-cruise-ships or Venice authorities lament lack of cruise ships as residents and UNESCO fight for the city's future (https://www.telegraph.co.uk/travel/cruises/articles/cruise-ships-and-venice-what-does-it-all-mean-for-the-city/) are examples, to name but two.

Therefore, the good coexistence between the cruise ships visiting a destination and the population living there should be considered essential (Gui & Russo, 2011) since, otherwise, residents could react against the visit of these boats (Jordan & Vogt, 2017). This opposition could end up materializing in rules that hinder (taxes) or even limit the number of ships and/or cruisers that can visit the destination (Hritz & Cecil, 2008), with negative effects for the companies in the form of larger costs or even loss of must-see destinations.

The academic literature has also referred to this phenomenon. Articles that try to understand what are the factors that determine the attitude of residents towards cruise ships have recently begun to appear. In fact, these perceptions may differ markedly as happened, for example, in the case of residents of Key West, Florida (Hritz & Cecil, 2008). To understand the drivers determining these differences in the resident's perceptions is not an easy task as evidenced by Del Chiappa et al (2018, p. 179) who state that *"studies applying the community-based tourism approach in the context of cruise activity are highly site-specific and hardly generalizable; hence, scholars should be encouraged to conduct similar studies in other cruise tourism destinations."* The present article contributes to this literature by analysing the perceptions that the residents of Las Palmas de Gran Canaria have about the economic, social and environmental impact that the cruise industry has on the island.

After this introduction, the paper is organized as follows. In Section 2 we undertake a review of the literature on local community perceptions of cruise tourism. Afterwards, Section 3 goes on describing the sample design, the structure of the questionnaire and the data used to estimate the model. Section 4 presents the factor analysis, regression analysis and empirical results. Finally, the conclusions and contributions are presented in Section 5.

2. LITERATURE REVIEW

A significant number of published papers study the several impacts that cruise activity can have on the host destination from an economic, environmental, political and socio-cultural point of view. The local community's perceptions, expectations and attitudes regarding the impact of cruise tourism should be considered (Mowforth & Munt, 2003) when planning and regulating if sustainable cruise tourism development is desired (Vernon et al, 2005). This explains why recent academic research has also been devoted to residents' perceptions and attitudes towards cruise tourism development.

The literature that analyses how the development of tourism impacts the local communities and the evolution of the relationship between residents and tourists when the destinations become mature has a long tradition (several review papers could be found such as, for example, Teye et al (2002), Harrill, 2004; and Monterrubio, 2008; to name but two). However, and when it comes to cruise tourism, the number of papers is much more reduced.

When dealing with tourism, and the cruise industry is not an exception, the research agenda interested in resident's perceptions has evolved from being interested mainly in the economic

issues[4] to become increasingly focused also on the environmental[5] and social impacts. Since the present study belongs to the latter last group, Table 1 below, summarizes the main characteristics of the articles that have studied the attitudes and perceptions of residents regarding the development of cruise tourism.

Table 1 shows that, to the best of the authors' knowledge, the first paper was published in 2008. Since then, twenty-three papers have been found on this issue, being a third published in the last two years. This undoubtedly shows an increasing academic interest in knowing the resident's perceptions towards the cruise industry.

A common characteristic of the studies summarized in Table 1 is that their analyses are based on primary data. Among the different methods available to gather primary data, most of them, 14 out of 24, have chosen a structured questionnaire (S-Q) being the second most popular, 7 out 24, the semi structured interview (SE-I). We have found only a paper using a structured interview (Hritz & Cecil, 2008) or a semi structured questionnaire (Martin Romero, 2010) although the latter author has also used SE-I. Finally, we have only found two studies (O'Brien, 2014 and Gonzalez Damian et al, 2017) which have used both SE-I and S-Q.

Concerning the distribution by continents of the port cities in which where the residents' perceptions towards cruise tourism have been analysed, it is noteworthy that the vast majority of the studies, 17 out of 24, concern a port city located in Europe (*Italy:* Brida et al, 2012ab; Pulina et al, 2013; Brida et al, 2014; Del Chiappa & Melis, 2015 and Del Chiappa & Abbate, 2016. *Spain:* Castillo-Manzano et al, 2014; Garay Tamajón, 2015; Hernandez et al, 2015; Alonso & Alexander, 2017; Del Chiappa et al, 2018 and the present study. *Croatia:* Perubic & Puh, 2012; Lucic et al, 2017 and Pivcevic et al, 2018. *Others*: O'Brien, 2014 and Uran et al, 2017) whilst only five of them are related with a port city located in America (*North America*: Hritz & Cecil, 2008; Stewart, et al 2011 and Gonzalez Damian et al, 2017. *South America*: Martin Romero, 2010; and Brida et al, 2011) and two with a port city located in Oceania (Wilson & Shone, 2013; and McCaughey et al, 2018). No studies were found on port cities located in Asia or Africa. Finally, 3 out of the 24 studies have included more than one port city (Stewart, et al, 2011; Brida et al, 2014; and Castillo-Manzano et al, 2014), but in all cases each city belongs to the same country.

With regard to the population under analysis, although most of the articles have considered only port-city residents, some of them have focused on local stakeholders (Hritz & Cecil, 2008; Castillo-Manzano et al, 2014; Alonso & Alexander, 2017; Uran et al, 2017; McCaughey et al, 2018; and Pivcevic et al, 2018) and only two studies have considered both groups (Martin Romero, 2010; and O'Brien, 2014). Additionally, and in relation to the sampling strategy, 14

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[4] For example, several studies use passenger surveys to estimate cruise ship passenger spending patterns. A recent review regarding this issue could be found in Baños & Tovar (2019). Others use data from national income accounts and industry reports to estimate multiplier effects of cruise industry spending on national income and employment (Dwyer et al, 2004; McKee & Chase, 2003).

[5] The industry faces many challenges in terms of the higher concern, especially in port-cities, regarding environmental impacts from cruise ships (i.e. air pollution and waste). For a recent review about the external cost estimation from in-port emissions released by vessels see Tichavska & Tovar (2017a) and for an estimation of exhaust pollutants, and the derived external cost, related to cruise and ferry operations in Las Palmas Port see also Tichavska & Tovar (2015ab).

out of 24 employed a convenience sample whereas the others ten followed a representative random stratified sample, being age and gender the most used characteristics to stratify (Brida et al, 2012ab; Pulina et al, 2013; Brida et al, 2014; Del Chiappa & Abbate, 2016; Del Chiappa et al, 2018; Pivcevic et al, 2018; and the present study) although the residence was also used in two occasions (Brida et al, 2011; and Hernandez et al, 2015). It should be noticed that only 7 out the 24 studies are based on a sample representative of the population they are studying.

As for the methodology followed, our literature review shows that the common practice is to employ a quantitative approach (20 out 24) although a few papers, 2 out 24, have used a qualitative approach (Alonso & Alexander, 2017; and McCaughey et al, 2018) or a combination of both (Hritz & Cecil, 2008; and Gonzalez Damian et al, 2017). When it comes to a qualitative approach, the Content Analysis is the one chosen. However, as Table 1 shows, when the quantitative approach is followed, a great variety of techniques could be found, varying from a mere statistical description of the results (i.e Wilson & Shone, 2013; Garay Tamajón, 2015 or Uran et al, 2017) to more elaborated statistics techniques (which are employed isolated or in combination), such as, non-parametric tests (Perubic & Puh, 2012; Hernandez et al, 2015), analysis of variance (Brida et al., 2011, 2012a, 2014; O'Brien, 2014; Del Chiappa & Abbate, 2016 and Gonzalez Damian et al, 2017), multivariate analysis of variance (Brida et al., 2012a, 2014), correspondence analysis (Brida et al., 2011, 2012ab, 2014), exploratory factor analysis (Pivcevic et al, 2018), principal component analysis (Del Chiappa et, 2018 and the present study), cluster analysis (Brida et al., 2011, Gonzalez Damian et al, 2017; Del Chiappa et al, 2018) and so on. Then again, we have also found four papers which use econometric models such as (Brida et al, 2012b; Pulina et al, 2013; Castillo-Manzano et al, 2014 and the present study).

Finally, as far as results are concerned, Table 1 shows that they vary from study to study, confirming what Del Chiappa et al (2018) stated regarding that they are "*hardly generalizable*". However, if we consider the results of the studies that are based on representative samples of the population they are analysing (Brida et al, 2012a,b; Pulina et al, 2013; Brida et al, 2014; Del Chiappa & Abbate, 2016; Del Chiappa et al, 2018 and the present study) two ideas could clearly emerge. The first one is that although residents always have some concerns regarding the negative impacts associated with cruise tourism development, overall they seem to believe that benefits outweigh the associated costs in all cases (Brida et al, 2012a,b; Pulina et al, 2013; Brida et al, 2014; Del Chiappa & Abbate, 2016) but one (Del Chiappa et al, 2018), no matter the cruise life cycle phase (Brida et al, 2014). The second one is that the residents' perceptions vary depending on several variables such as their economic activity, place of residence and previous cruise experience (Brida et al, 2012a,b) or geographical proximity (Del Chiappa & Abbate, 2016; Del Chiappa et al, 2018) to name a few. However, conclusions regarding how these variables affect the residents' perceptions are inconclusive due to the contradictory results found when comparing the studies.

Table 1. Literature review of papers studying the residents' attitudes and perceptions towards cruise tourism development.

Authors (year)	Data	Sample	Methodology
Hritz & Cecil. (2008)	-Port city: Key West (Florida, USA) -Period: NA -Year: NA -Population: S	**Representativeness:** NR -7 S-I **Sampling strategy:** A convenience sample: -7 stakeholders economically dependent on tourism	-The land-use tourism model -Case study
Martin Romero (2010)	-Port city: Puerto Madrym (Argentina) -Period: October-December -Year: 2009 -Population: R and S	**Representativeness:** NR -19 SE-I -59 SE-Q **Sampling strategy:** A convenience sample: -5 public or private entities, 10 shops' owners, 4 travel agencies, 59 residents	-Descriptive -Content Analysis
Brida et al (2011)	-Port city: Cartagena (Colombia) -Period: October-December -Year: 2009 -Population: R	**Representativeness**: NA -1001 S-Q **Sampling strategy:** S-Q were randomly distributed to Households	-CA -HCA -ANOVA
Stewart, et al (2011).	-Port city: Cambridge Bay and Pond Inlet (Canada) -Period: NA -Year: 2006-2007 -Population: R.	**Representativeness** (*Sample Cambridge Bay*): NR -70 SE-I **Representativeness** (*Sample Pond Inlet*): NR -71 SE-I **Sampling strategy**: A convenience sample	-Descriptive
Brida et al (2012a)	-Port city: Messina (Sicily, Italy) -Period: April-August -Year: 2011. -Population: R16	**Representativeness**: 1% -1500 S-Q **Sampling strategy**: a representative random stratified sample (age & gender)	-CA -ANOVA -MANOVA
Brida et al (2012b)	-Port city: Messina (Sicily, Italy) -Period: April-August -Year: 2011. -Population: R16	**Representativeness**: 0.074% -1500 S-Q **Sampling strategy**: a representative random stratified sample (age & gender)	-CA -A mixed generalized ordered logit analysis
Perubic & Puh (2012)	-Port city: Dubrovnik (Croatia) -Period: May-June -Year: 2011. -Population: R	**Representativeness**: NR -350 S-Q **Sampling strategy**: A convenience sample	-Descriptive -Non-parametric tests: . Mann-Whitney . Kruskal-Wallis
Pulina et al (2013)	-Port city: Olbia (Sardinia, Italy) -Period: May-October -Year: 2011. -Population: R16	**Representativeness**: 2.6% -1208 S-Q **Sampling strategy**: a representative random stratified sample (age & gender)	-A generalized ordered logit model

| Authors (year)	Data	Sample	Methodology
Wilson & Shone (2013)	-Port city: Akaroa (New Zealand) -Period: May -Year: 2013 -Population: R.	**Representativeness**: NR -316 S-Q **Sampling strategy**: A convenience sample. –3 samples: Akaroa township Resident =181; Holiday owners = 85; District = 50	-Descriptive
Brida et al (2014)	-Port cities: Messina (Sicily, Italy) & Olbia (Sardinia, Italy) -Period: summer -Year: 2011. -Population: R16	**Representativeness** (*Sample Messina*): 1%; 1500 S-Q **Representativeness** (*Sample Olbia*): 2%; 947 S-Q **Sampling strategy**: a representative random stratified sample (age & gender)	-CA -ANOVA -MANOVA
Castillo-Manzano et al (2014)	-Port cities: Malaga & Seville (Spain) -Period: October-February -Year: 2012-2013. -Population: Managers of tourism companies located in the hinterland	**Representativeness** (*Sample Malaga*): NR -170 S-Q **Representativeness** (*Sample Seville*): NR -201 S-Q **Sampling strategy**: A convenience sample	-Multinomial logit regression
O'Brien (2014)	-Port city: Ísafjörður (Iceland) -Period: October-December -Year: 2009 -Population: R and S	Representativeness: NR -12 SE-I -259 S-Q **Sampling strategy:** A convenience sample:	-Descriptive -ANOVA -t-tests
Del Chiappa & Melis (2015)	-Port city: Cagliari (Sardinia, Italy) -Period: NA -Year: NA. -Population: R	**Representativeness:** NR -1039 S-Q **Sampling strategy**: A convenience sample	-Non-parametric tests: . Mann-Whitney . Kruskal-Wallis.
Garay Tamajón (2015)	-Port city: Barcelona (Spain) -Period: December -Year: 2013. -Population: R	**Representativeness**: NR 84 S-Q **Sampling strategy**: A convenience sample -57.14% have any relation with tourism	-Descriptive
Hernandez et al (2015)	-Port city: Las Palmas de Gran Canaria (Spain) -Period: Oct-Nov -Year: 2013 -Population: R16.	**Representativeness**: NA -467 S-Q **Sampling strategy**: a representative random stratified sample (residence).	-Non-parametric tests: . Mann-Whitney . Kruskal-Wallis.
Del Chiappa & Abbate (2016)	-Port city: Messina (Sicily-Italy) -Period: NA -Year: NA -Population: R16	**Representativeness**: 1% -1500 S-Q **Sampling strategy**: a representative random stratified sample (age & gender)	-ANOVA -t-tests
Alonso & Alexander (2017)	-Port city: La Palma (Spain) -Period: Nov-April -Year: 2013-2014	**Representativeness**: NR -15 SE-I **Sampling strategy**: A convenience sample	-Content analysis

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Authors (year)	Data	Sample	Methodology
	-Population: S	-3 wine association, 3 tourism sector, 5 local government and 4 local business	
Gonzalez Damian et al (2017)	-Port city: San Miguel de Cozumel (Mexico) -Period: June-August -Year: 2013 -Population: R	**Representativeness**: NA -320 S-Q -12 SE-I **Sampling strategy**: A convenience sample	-HCA -ANOVA -t-tests -Content analysis
Lucic et al (2017)	-Port city: Dubrovnik (Croatia) -Period: Summer -Year: 2015 -Population: R18	**Representativeness**: NR -122 S-Q **Sampling strategy**: A convenience sample -Participants were chosen to be medium and highly educated Dubrovnik's residents	-Descriptive -t-test -Spearman coefficient
Uran et al (2017)	-Port city: Koper (Slovenia) -Period: NA -Year: NA -Population: Restaurants & bars' owners in Koper	**Representativeness**: NR -9 SE-I **Sampling strategy**: A convenience sample	-Descriptive
Del Chiappa et al (2018)	-Port city: Valencia (Spain) -Period: summer cruise season -Year: 2012 -Population: R16	**Representativeness**: 5.58% -321 S-Q **Sampling strategy**: a representative random stratified sample (age & gender).	-PCA -Cluster analysis, -Latent gold segmentation
McCaughey et al (2018)	-Port city: Esperance (Australia) -Period: NA -Year: NA -Population: S.	**Representativeness**: NR -14 SE-I **Sampling strategy**: A convenience sample	-Content analysis
Pivcevic et al (2018)	-Port city: Dubrovnik (Croatia) -Period: Spring -Year: 2013 -Population: S.	**Representativeness**: NR -105 S-Q **Sampling strategy**: a representative random stratified sample (age & gender).	-Non-parametric tests: . Mann-Whitney . Kruskal-Wallis. -EFA
PRESENT STUDY	-Port city: Las Palmas de Gran Canaria (Spain) -Period: cruise season -Year: 2018 -Population: R18	**Representativeness**: 5% -400 S-Q **Sampling strategy**: a representative random stratified sample (age & gender).	-PCA -A generalized ordered logit model

2   NOTE: R = Residents, R16 = Residents aged 16 or above, R18 = Residents aged 18 or above, S= Stakeholders, S-I = Structured Interview, SE-I = Semistructured Interview, S-Q=

3   Structured questionnaire, S-Q= Semistructured questionnaire, NA= Not available; NR= non-representative; CA = Correspondence analysis, HCA = Hierarchical cluster analysis,

4   ANOVA=Analysis of variance; MANOVA= - Multivariate analysis of variance; EFA= Exploratory factor analysis, PCA= Principal component analysis.

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3. DATA

The Canary Islands (Spain) are a major world tourist destination, with around 15.5 million tourists (ISTAC, 2018). In the case of the island of Gran Canaria, around 4.5 million visited the island and, approximately, 425,000 stayed in the island's capital, the city of Las Palmas de Gran Canaria (henceforth LPGC).

The number of cruisers in the port of LPGC has been increasing at an exponential rate over the last two decades, going from 60,508 visitors in the year 1998 to 673,572 in 2018, as shown in Figure 1. Around the year 2005, the port of Las Palmas became the home port for several cruise lines, which increased the growth rate. In fact, the average annual increase in cruise passengers was 17,458 in the 1998-2008 period and 43,847 between 2008 and 2018 (2.5 times higher).[6]

Figure 1. Number of cruise passengers per year.
Port of Las Palmas de Gran Canaria (1998-2018)
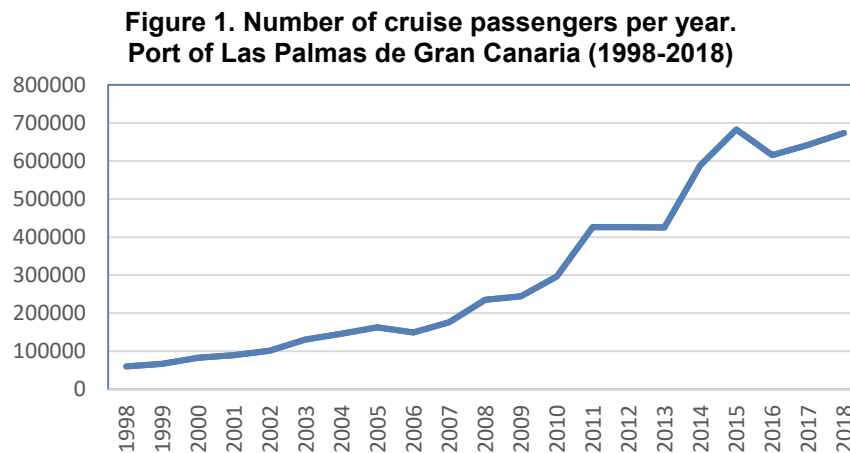
Source: Own figures based on data from Statistical Institute of the Canary Islands (ISTAC)

To the best of the authors' knowledge, Hernández et. al. (2015) is the only study that analyse the perceptions of LPGC residents regarding the specific impacts of tourism from cruises and they obtained similar findings than Del Rio and Rodriguez (2019) who analyses the vision of the inhabitants of LPGC about the tourism phenomenon. Hernández et. al. (2015) found that a great majority of residents have a positive view about the contribution of the cruise tourism to the economy, employment and cultural exchange although residents were more skeptical about possible environmental impacts.

In recent years some reactions of *tourismophobia* against cruise tourists were reported in Barcelona[7] and the Balearic Islands[8] (the two main touristic regions in Spain), but not in the Canary Islands (the third most visited region). The Hernández et. al. (2015) study is based on

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[6] At the end of the first quarter of 2020, the cruise industry was affected by the closure of ports and airports within the state of alarm decreed by the Spanish government between March and May 2020, to combat the covid-19 pandemic, when cruise traffic levels were reduced to zero. However, these events are not included in this paper as they occurred after the completion of this work.

[7] See footnote 2.

[8] Currently (June 2019), several initiatives involving Mallorca residents and environmental groups have called for an increase in cruise ship tourist tax and for restrictions on the number of cruise ships in Palma and a daily limit equal to 4,000 on the number of cruise passengers (Majorca Daily Bulletin, 2019).

figures from 2012 (last year considered); since then, the number of cruise-passengers in the city increased by 58.7%. Using data from the year 2018, residents in LPGC could be under a similar pressure from cruise-tourists than Barcelona since LPGC received an average of 1.78 cruisers per resident and Barcelona 1.79 cruisers per resident. Therefore, an additional and updated opinion survey in the city of LPGC might be needed to capture the specific perceptions of residents in this destination.

## 3.1 Sample design and data description

The city of LPGC ranks in the ninth place among the Spanish cities according to its population (ISTAC, 2018). Administratively, the city is divided into five different districts as shown in Figure 2. Not all areas of the city are equally affected by cruise activity since it is mostly concentrated in some specific zones.

Figure 2. City Districts. Las Palmas de Gran Canaria.
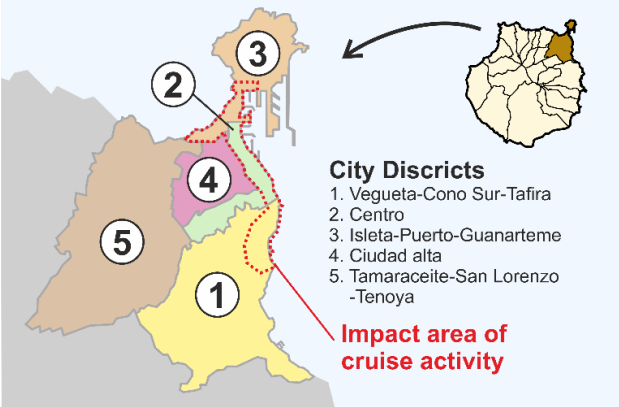
Interactions between residents and tourists from cruises are also concentrated in some periods, since the cruise activity is subject to great seasonal variation, as shown in Figure 3. Due to the massive influx of cruise ship tourists from October to April, some commercial areas of the city are being considered as "tourist hotspots" since 2014. This allows shops to open on Sundays in these areas from October to April whereas the rest of the city areas can only be opened on ten Sundays and bank holidays during the year.

Figure 3. Monthly cruise passengers Port of Las Palmas de Gran Canaria (2018)
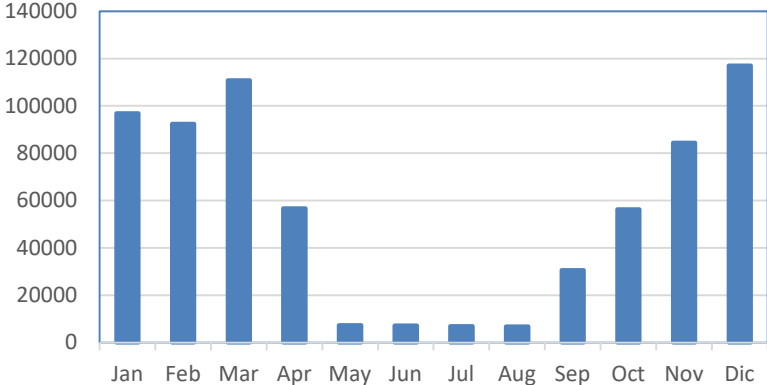
Our sample design (described in Table 2) focused on an area of interest for the cruise activity (see dotted line in Figure 2) that includes these commercial areas and the main tourist attractions located in the historical center of the city. The design is approximately as follows: one third of the sample covers the main historical city center (Triana and Vegueta), another third is focused in the main shopping areas (Alcaravaneras, Mesa y López, Santa Catalina, Mercado del Puerto, Las Canteras y La Isleta) and the rest of the sample covers residents in all other areas of the city (where stores are not allowed to open on Sundays). Respondents were a sample of residents in LPGC (representative of the population structure by age and sex), randomly selected by a professional survey company and interviewed during the cruise ship activity season (November 2018). A final sample of 402 personal interviews was reached, accounting for an error margin of 4,9% (considering a 95% confidence level). In this sense, all the results obtained refer to the opinion prior to the Covid-19 pandemic in 2020.

Table 2. Population by districts and sample size by areas in LPGC (2019)

City Districts	Population	%	City areas in the sample	n	%
1. Vegueta, cono sur y Tafira	72,548	42.5	Triana Vegueta	120	30.1
2. Centro (incl. Triana)	87,190		Avenida Marítima	1	
			Alcaravaneras	11	
			Mesa y López	32	
3. Isleta-Puerto-Guanarteme	67,394	17.9	Santa Catalina	34	37.1
			Mercado del Puerto	54	
			Las Canteras	6	
			La isleta	12	
4. Ciudad Alta	105,961	39.6	Other areas	132	32.8
5. Tamaraceite-S.Lorenzo-Tenoya	44,896				
Total	**376,290**			**402**	

Source: Population figures from LPGC City Council website (updated to October 2019).

In order to test the validity of the questionnaire, an initial pilot test was conducted with 145 interviews distributed through the Google-forms toolkit which allowed the survey to be refined. The final questionnaire included some questions to determine the profile of the respondents and the possible relations with the activity of the cruises along with some socioeconomic variables. According to this information, 92% or respondents had been living in the city for more than 10 years, and 67.6% within an area where shops are affected by opening on Sunday during cruise season. There was a direct connection with port activity for 16.2% of the sample and an indirect relation for 13.4% (as they were working in shops or restaurants visited by tourists from cruises) and 67.2% did not have any relation with cruises. The main socioeconomic characteristics of the sample are presented in Table 3.

Table 3. Socioeconomic characteristic of the sample

Variables	Category	n	%
	18-25	57	14.2
	26-35	49	12.2
Age	36-45	56	13.9
	46-55	87	21.6
	56-65	77	19.2

Variables	Category	n	%
	>65	76	18.9
Sex	Male	194	48.3
	Female	208	51.7
Level of study	No studies	7	1.7
	Primary	146	36.3
	Secondary	60	14.9
	High School	104	25.9
	University	85	21.1
Level of income	NA	40	10.0
	<500	15	3.7
	500-1000	144	35.8
	1001-2000	141	35.1
	2001-3000	49	12.2
	>3000	13	3.2

3.2. Questionnaire: structure and descriptive analysis

The questionnaire included 25 items. Impacts from cruise activity were selected following the standard classification of impacts from tourism (see, for example, Cooper and Hall, 2008) that considers three categories: (i) Economic, (ii) Environmental and (iii) Social impacts. In addition, some questions were included to find out the opinion on the role of the government, which added a category (iv) called "Public Policy". Finally, the questionnaire included four questions about the perceived importance of impacts in the economic, environmental and social areas (items 6, 13, 20 and 25), which allowed for a global idea of the impacts in each of these areas and the general impact of Cruise Tourism in Gran Canaria (item 25).

Items were presented as statements that residents had to rate on a 5 level Likert Scale (from 1: "totally disagree" to 5: "totally agree"). The Internal consistency of the Likert questionnaire was considered acceptable, with a value of 0,703 in the Alpha-Cronbach index. The results of the opinion survey are presented in Table 4.

Table 4. Residents´ opinions about Cruises impacts in LPGC.

ITEMS IN THE QUESTIONNAIRE	Mean	Mode	St. Dv.
(I) ECONOMIC IMPACTS			
1. Cruisers expenditure is very important for the economy of Gran Canaria	4.3	5	0.90
2. Cruise tourism causes an increase in prices	2.9	3	0.92
3. Cruise tourism creates many jobs in Gran Canaria	3.1	3	0.95
4. A lot of people go to unemployment when the cruise season is over	3.1	3	0.93
5. Some shops open on Sundays in cruise season, and that hurts other businesses	4.2	5	0.96
6. I think the ECONOMIC IMPACT of cruise tourism in the economy of Gran Canaria is...	3.9	4	0.68
(II) ENVIRONMENTAL IMPACTS			
7. The vision of cruise ships docked in the harbour conveys a positive feeling	4.4	5	0.87
8. The urban equipment and infrastructures of Las Palmas de GC are better due to the cruises	2.9	2	1.10
9. Las Palmas de GC is dirtier when cruise ships come	1.8	1	0.90
10. Air pollution in Las Palmas increases with cruises	2.3	2	1.13
11.The water of the beach of the Alcaravaneras is dirtier the days with cruises	2.4	2	1.05

ITEMS IN THE QUESTIONNAIRE	Mean	Mode	St. Dv.
12. Cruises and cruisers activities generate a lot of noise	2.0	2	0.62
13. I think the ENVIRONMENTAL IMPACT of cruise tourism in the environment of Gran Canaria is...	3.1	3	0.70
(III) SOCIAL IMPACT			
14. The arrival of cruises has contributed to improve the cultural offer of Las Palmas de GC	3.5	4	1.01
15. Cruise tourism has made the city of Las Palmas de GC recognized as a quality destination	4.1	4	0.85
16. It is positive that the shops are open on holidays due to the arrival of cruises	4.0	5	1.11
17. The cruisers are very interested in our culture and contribute to keep our traditions	3.2	4	0.87
18. Sometimes it is uncomfortable to go to certain places by the amount of cruisers	2.2	2	0.84
19. When there are cruises it is difficult to enjoy some services (tables on a terrace, free taxis, etc.)	2.3	2	0.82
20. I think the SOCIAL IMPACT of cruise tourism in the Society of Gran Canaria is...	3.6	4	0.60
(IV) PUBLIC POLICY			
21. It is necessary to put some limit on the arrival of cruises	1.4	1	0.91
22. The Government should economically encourage the arrival of cruises	3.0	3	0.99
23. A tourist fee must be charged for each cruise passenger	2.4	1	1.36
24. It should be encouraged the disembarking of more cruise passengers	4.7	5	0.67
25. I think the GENERAL IMPACT of cruise tourism in Gran Canaria is...	3.5	4	0.55

Note: St. Dv. = Standard deviation

4. EMPIRICAL RESULTS

The aim of the paper is to explain how LPGC residents' preferences are for Cruise Tourism. A binary logit model is estimated to obtain empirical results on how LPGC residents perceive the impacts of Cruise Tourism in Gran Canaria. There are two types of dependent variables used for the estimation. The first type are variables created by Principal Component Analysis, as explained below, and the second type are socioeconomic variables extracted from the questionnaires.

4.1 Factor analysis and factor definition

Prior to the estimation of the model, a Principal Component Analysis (PCA) was carried out with the aim of reducing the total number of variables to be considered. Both the Kaiser Meyer Olkin (KMO) test and the Bartlett's test of sphericity were used as measures of the adequacy of the sampling to perform the PCA. As we obtained a KMO value equal to 0.777 and a Bartlett spherical value equal to 0,000, the PCA is appropriate in our case. The results of the PCA using a Varimax rotation matrix, to facilitate the interpretation of the factors, are shown in Table 5. The extraction obtained suggested an aggregation of the 21 items of the questionnaire[9] into 7 categories or factors that jointly account for 61.09% of the variance.

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[9] Items 6, 13, 20 and 25 were ruled out of the PCA for obvious reasons: the item 25 will be the endogenous variable and items 6, 13, and 20 could be correlated with the item 25.

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Table 5: Factor analysis. Total variance explained

Factors	Items in the questionnaire	Total variance explained (%)
Factor 1 *Socio-economic*	1. Cruisers expenditure is very important for the economy of Gran Canaria 7. The vision of cruise ships docked in the harbour conveys a positive feeling 8. The urban equipment and infrastructures of Las Palmas de GC are better due to the cruises 14. The arrival of cruises has contributed to improve the cultural offer of Las Palmas de GC 15. Cruise tourism has made the city of Las Palmas de GC recognized as a quality destination 17. The cruisers are very interested in our culture and contribute to keep our traditions 22. The Government should economically encourage the arrival of cruises	12.76
Factor 2 *Environment*	9. Las Palmas de GC is dirtier when cruise ships come 10. Air pollution in Las Palmas increases with cruises 11. The water of the beach of the Alcaravaneras is dirtier the days with cruises 12. Cruises and cruisers activities generate a lot of noise	12.28
Factor 3 *Market Effects*	2. Cruise tourism causes an increase in prices 3. Cruise tourism creates many jobs in Gran Canaria 4. A lot of people go to unemployment when the cruise season is over	9.23
Factor 4 *Congestion*	18. Sometimes it is uncomfortable to go to certain places by the amount of cruisers 19. When there are cruises it is difficult to enjoy some services (tables on a terrace, free taxis, etc.)	8.44
Factor 5 *Commerce Policy*	16. It is positive that the shops are open on holidays due to the arrival of cruises 24. It should be encouraged the disembarking of more cruise passengers	6.64
Factor 6 *Government Policy*	21. It is necessary to put some limit on the arrival of cruises 23. A tourist fee must be charged for each cruise passenger	6.48
Factor 7 Small Businesses	5. Some shops open on Sundays in cruise season, and that hurts other businesses	5.21
Total		61.09

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The factors considered, ordered according to the percentage of total variation explained, are the following: *Factor 1-Socio-economic* and includes positive impacts for the society such as the above mentioned visual impact, the importance of cruisers spending in the city (initially considered as an economic impact in the questionnaire), other socio-cultural impacts (on cultural life, the city equipment or the perceived quality of the city as a destination) and public involvement in policies supporting the industry (initially under the "public policy" category in the questionnaire). The second factor corresponds basically to all the items initially included under the category "Environmental impacts" except for the visual impact. This might be explained because dirt, pollution and noise are all negative impacts, whereas the visual impression of the cruise ships is considered positive, as shown in the previous analysis. *Factor 3-Market Effects* includes the effects on prices and on the labor market. Factor 4 was named *congestion* since it includes items related to discomfort and difficulty of access to places and services due to the massive presence of cruisers. The consideration of issues related to the *Commerce policy* were grouped together in Factor 5, which includes the policy of Sunday opening hours or policies to encourage the disembarkation of cruisers due to their positive impacts on local stores. Factor 6, named *Government policy*, refers to public policies to limit cruise activity (including quantitative limits and taxes). The last factor was named *Small business* as it refers to the negative effect that cruise activity could have on local businesses due to Sunday's opening.

4.2. Regression Analysis

Discrete choice models are the economic framework for analysing qualitative responses. The ordered logit model is the specific model when the dependent variable is a categorical variable, that is, the individual opinions are given by choosing a response among different categories defined by numerical values (Greene and Hensher, 2010) such as those derived from a 5-level Likert Scale. In other words, the model tries to explain the endogenous variable through two types of explanatory variables: the observed outcomes which are the individual opinion chosen among different categories by a set of people in a choice; and, the demographic characteristics of each person (e.g. sex, age, income, etc.) making their choice. However, when the variation of the dependent variable is insufficient the binary logit model or the logistic regression model is the appropriate econometric model.

In order to explain the perceptions of the residents towards Cruise Tourism a binary logit model is estimated since there is an insufficient variation in our dependent variable. Thus, the five categories have been transformed into only two responses, that is, a binary choice, where the dependent variable is equal to 1 if the residents' opinions are *totally agree* or *agree* and to 0 otherwise.

The binary dependent variable can be explained by explanatory variables (attributes and/or socioeconomic variables). The probability of the event occurring[10] or not is expressed as:

$$Prob(Y = 1) = F(x, \beta)$$

$$Prob(Y = 0) = 1 - F(x, \beta)$$

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[10] The probability that the individual chooses the alternative 1: he/she considers that the GENERAL IMPACT of cruise tourism in Gran Canaria is positive.

where x are the explanatory variables and β is a set of parameters which reflects how the explanatory variables' changes impact on the probability. The model could be defined by a linear regression as:

$$F(x, \beta) = \beta' x$$

where $E[Y|x] = F(x, \beta)$ and the model consists in the following latent regression:

$$Y = E[Y|x] + (Y - E[Y|x]) = \beta'x + \varepsilon$$

being Y the unobserved variable in the linear regression model, β a set of parameters to estimate and ε the random error. This error term is assumed to follow a logistic distribution[11] for a binary logit model. The probability of this model is:

$$Prob(Y = 1|x) = \frac{exp(x'\beta)}{1 + exp(x'\beta)}$$

The binary logit model is estimated based on the method of maximum likelihood (see Greene, 2012 for more details).

As mentioned above, the variables used for the estimation are: the seven variables created by PCA, as explained above, and the socioeconomic variables that were tested in the estimation as dummy variables. Different binary logit models were estimated depending on the combination of variables included. The variables included in the best model[12] are summarized in Table 6. The results of the estimation are presented in table 7.

Table 6: Definition of variables for estimation

Variable	Definition	Type
Factor 1 – Socio-economic	Items 1, 7, 8, 14, 15, 17, 22	Factor
Factor 2 - Environment	Items 9, 10, 11, 12	Factor
Factor 3 – Market Effects	Items 2, 3, 4	Factor
Factor 4 - Congestion	Items 18, 19	Factor
Factor 5 - Commerce Policy	Items 16, 24	Factor
Factor 6 - Government Policy	Items 21, 23	Factor
Factor 7 - Small Businesses	Item 5	Factor
Age 26-35 years old	1 if the individual is between 26 and 35 years old	Dummy
Age > 65 years old	1 if the individual is greater than 65 years old	Dummy
Familiar cruise activity	1 if the individual a relative who his/her activity is related with cruises tourism	Dummy
Known person cruise activity	1 if the individual a known person who his/her activity is related with cruises tourism	Dummy

For model 1, all variables are significant except for *Factor 5-Commerce Policy* and *Factor 7-Small Business*. Model 2 is equal to model 1 but not including the Factor 5 and 7 as variables in the specification. The model 2 results are better than those of model 1: All variables are significant at 95% confidence level and quite similar in terms of goodness fit of the model.

The estimated parameter indicates that there is only one factor which has a positive impact over the endogenous variable (it increases the probability that the residents' perceptions be positive).

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[11] If the error term is assumed to have a normal distribution, a binary probit model is obtained.
[12] Finally, only four socioeconomic variables were statistically significant at 95% of confidence level (see Table 7). The software used for the estimation is NLOGIT 6.0 (Greene, 2016).

Specifically, in the opinion of residents, the economic and social impact of cruise tourism is positive in terms of cruisers spending, improvement of cultural and social alternatives, recognition as a quality destination and improvement of urban infrastructures.

Table 7: Estimate results

Variable	Model 1		Model 2	
	Parameter	t	Parameter	t
Factor 1 – Socio-economic	1.31718***	7.86	1.30668***	7.84
Factor 2 - Environment	-0.80646***	-5.18	-0.81080***	-5.19
Factor 3 – Market Effects	-0.75377***	-5.49	-0.75045***	-5.50
Factor 4 - Congestion	-0.80821***	-5.18	-0.80163***	-5.17
Factor 5 - Commerce Policy	0.20481	1.54	-	-
Factor 6 - Government Policy	-0.22087*	-1.66	-0.22743*	-1.72
Factor 7 - Small Businesses	-0.11238	-0.84	-	-
Age 26-35 years old	-1.25110***	-3.26	-1.21823***	-3.22
Age > 65 years old	0.68069**	2.21	0.71778**	2.35
Familiar cruise activity	1.00141**	2.11	1.03076**	2.20
Known person cruise activity	0.65982***	2.76	0.62278***	2.64
Log-likelihood	-193.31		-194.93	
McFadden Pseudo R-squared	0.30		0.30	
Observations	402		402	

 ***, **, * Significance at 1%, 5%, 10% level

Besides, four factors have a negative effect on the likelihood that residents' perceptions will be positive. Residents believe that cruise tourism has a negative impact in terms of air pollution, marine pollution and dirt accumulation (*Factor 2-Environment*). Moreover, other negative aspects perceived by residents are price increases and unemployment outside of the cruise season (*Factor 3-Market Effects)*. In addition, there is also a negative impact in terms of congestion (*Factor 4-Congestion)* that could be explained by the negative externality in terms of congestion when residents want to access basic services such as taxis, restaurants, etc. On the other hand, resident perceive as negative some policy initiatives that seek to limit the cruise arrivals or impose a touristic tax (*Factor 6-Government Policy*). Finally, socioeconomic variables show that people over 65 years of age perceive the impact of cruise tourism as positive, as do people who have a relative or acquaintance working in the cruise activity. However, people between the ages of 26 and 35 have a negative perception of cruise tourism.

Finally, if the results of this study are compared with the results of other similar studies reviewed in the literature review section (those based on representative samples of the population being studied), three important elements are remarkable. The first is that the socio-economic and cultural effect of the tourism cruise is positive according to the perceptions of the residents (Brida et al, 2012a, b; Brida et al, 2014). The second is that the environmental effect of the tourism cruise has been perceived as causing a negative impact by the residents (Brida et al, 2012a, b; Brida et al, 2014). Brida et al (2014) have also found that there is a negative social externality that is defined as an increase in congestion in public and recreational areas and an increase in micro-crime. A similar result is obtained in the present study where a specific factor of congestion was identified, and its effect is negative. The third is that the residents' perceptions could vary according to socio-economic variables (Brida et al, 2012b; Brida et al, 2014; Chiappa and Abate, 2017; Chiappa et al, 2018; Pulina et al, 2013) although there is not a generalised rule because the results are specific to each study. In this study, if the resident is older than 65 years he or she has the perception that the impact is positive (Brida et al, 2012b; Brida et al, 2014; Chiappa and Abate, 2017; Chiappa et al, 2018). However, if the resident is between 26

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and 35 years old, the impact is perceived as negative. Finally, if the resident has a relative or an acquaintance who works in relation to the cruise activity, the perceived impact is also positive.

5. CONCLUSIONS AND CONTRIBUTIONS

To analyse residents' perceptions of cruise tourism a survey of a representative sample of 402 respondents was conducted at LPGC. The questionnaire included 25 items to be valued in a 5-level Likert scale regarding economic, environmental and socioeconomic impacts, as well as the role of the government in regulating the activity.

Overall results of the descriptive analysis show that people perceive the economic impact of cruises on the city as very positive, despite the fact that there is not a clear idea about the net effect on the labor market and prices. Regarding the environmental impact, the distribution of responses shows that people do not have a clear idea about this issue, and most of them respond with "indifferent" level of importance. Moreover, most people think that cruisers are interested in cultural values and traditions and that this activity contributes to improve both the cultural offer of the city and the image of the city as a quality destination.

Opinions on the role of the Government support this positive view of the cruise activity, since people clearly think that there is no reason to limit or impose any tourist tax on cruise arrivals. On the contrary, people are generally in favour of encouraging the disembarkation of more cruisers, although it should not be supported by public subsidies. Finally, there is a controversial issue regarding the special opening hours on Sundays in the areas affected by cruises. Although it is perceived as positive, there are also fears of possible negative impacts on small and medium-sized businesses.

Using an econometric model, residents' perceptions are identified through different covariates that include not only the seven factors identified through PCA, but also several socio-economic variables. The empirical results show that only one of the seven factors has increased the probability that residents' perceptions are positive (*Factor 1-Socio-economic*) whereas four out of seven have the opposite effect (*Factor 2-Environment,* the *Factor 3-Market Effects,* the *Factor 4-Congestion, Factor 6-Government Policy*). In addition, and with regard to the socio-economic variables, three were also identified as explanatory variables. That is, the impact of cruise tourism has a positive effect if the resident is over 65 years old as well as people who have a relative or known person working in cruise activity. However, people who are between 26 and 35 years old have a negative perception of cruise tourism.

The results of this study are in line with other similar studies reviewed in the literature review section. In general, the residents' perceptions towards the cruise tourism has a positive effect from the socio-economic point of view. Regarding the environmental effect, the residents' perception is negative in terms of air pollution, marine pollution and dirt accumulation (*Factor 2-Environment*) as expected. Moreover, the perception of congestion defined as the discomfort of going to certain places and the difficulty to enjoy some services (*Factor 4-Congestion*) is also negative.

Finally, residents' perception of public policies that limit the development of cruise tourism is negative (*Factor 6-Government Policy* significant and negative). This result seems to indicate that there is no need to limit the arrival of cruises or to impose a tourist tax in Gran Canaria.

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Therefore, and from a practical point of view, it should be noted that although LPGC residents may be under similar pressure from cruise tourists as Barcelona, if we take into account the average number of cruisers per resident in 2018, there are some differences in the way LPGC and Barcelona residents react (for years, and in order to reduce the number of cruise ship visiting Barcelona, some neighborhood associations and environmental groups have campaigned), which show that the final perception of cruise tourism is a complex issue that depends on aspects that cannot be fully captured with aggregated figures. In fact, site-specific factors, such as the concentration of tourist in time (determined by the size of ships docked) and in space (affected by the spatial dispersion or concentration of tourist attractions) could explain these differences.

However, as our literature review has shown, conclusions about how those variables affect residents' perceptions are inconclusive due to the existence of contradictory results found when the studies are compared. Therefore, it would be desirable that future research focus on standard questionnaires to facilitate comparisons between studies and, consequently, to better identify the factors mentioned. For the success of this task (unified survey) the cooperation between the academia and the industry, specially Cruise Port Associations, would be very useful.

Moreover, it should be noted that to achieve a higher degree of reliability in the results of the studies, they should be based on representative samples of the population they are analysing. This is not currently a common practice, as our review of the literature has shown. It should also be noted that there are very few studies relating to the perception of the residents of a port city located in America or Oceania and none in Asia or Africa. Further research in these locations would therefore be desirable.

To sum up, we can conclude that actual knowledge of residents' perceptions of cruise tourism, how it evolves and what its determinants are, is paramount for the cruise industry, in order to design adequate policies and act proactively not only to reverse and/or reduce the negative perceptions of residents but also to avoid the negative effects that could result from those perceptions such as, for example, policies that limit the number of cruise ships or that collect/increase the tax per cruise passenger, to name but two. Finally, as our study covers only the state of opinion prior to the covid-19 pandemic in 2020, it seems very important to study residents' perceptions in the new context, where the positive perceptions shown in the study could be offset by the new health risks associated with the spread of the virus if no health checks are applied to cruise ship passengers.

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