

An unexpected polarization: Individual-level factors behind the public acceptance of the superblocks of Barcelona

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Abstract

Traffic calming and pedestrianization schemes are increasingly considered a solution for cities to improve air quality and foster wellbeing of the local population. Given that public opposition is considered one of the main obstacles to the introduction of this type of interventions, this paper investigates public acceptance and attitudes towards a specific urban intervention to reduce air pollution: the superblocks. Based on a survey (N=581) and focus groups (N=16) with residents in Barcelona, Spain, we analyse on the beliefs and emotions, as well as the socio-demographic characteristics of supporters and opponents to the superblocks. The results showed a significant polarization in the acceptance of the superblocks. Relative to opponents to the superblocks, supporters were younger, more likely to be female, more likely to live near a superblock, not own a car and position themselves on the left side of the ideological scale. Policy-specific beliefs, emotions, perceived process legitimacy and institutional trust were strongly associated to acceptance of the superblocks. These findings constitute a first step to the study of the social dynamics that underlie acceptance and opposition to the superblocks.

Keywords: Air pollution, traffic calming schemes, urban interventions, public acceptance, survey, focus groups.

1. Introduction

The implementation of traffic calming and pedestrianisation schemes is increasingly considered a solution for cities to adapt to climate change, improve urban air quality and foster the health and wellbeing of the local population (Morrison, Thomson and Petticrew, 2004). Increased green space, more public space for walking, interacting and

cycling, not only has the potential to reduce the car dependence and increase walkers' safety and comfort but also to improve broader aspects of health and wellbeing and contribute to cities' economic, environmental and social sustainability and resilience. Car-free zones, as well as other traffic calming interventions, are also considered effective tools to increase the city's liveability, by improving the accessibility, mobility, safety, and environment that make the city a better place to all its inhabitants (Yassin, 2019).

Despite the potential environmental and societal benefits of interventions to reclaim space in cities for recreational and community activities, cities have traditionally faced several barriers during implementation. Among others, opposition from residents, drivers and local merchants, cost recovery, planning for the shifted traffic circulation, application and lack of political support (Parajuli and Pojani, 2018). Public opposition is often considered one of the main obstacles to the introduction of interventions to reduce traffic-related air pollution (Allen, Gaunt, and Rye, 2006; Eliasson and Jonsson, 2011; Schade and Schlag, 2003). Local policy makers may be reluctant to try new measures such as congestion charges, low-emission zones, the recovery of public spaces or downtown pedestrianisation that may be necessary because of their effectiveness but difficult to implement because of potential public opposition or the political difficulty of putting them into practice (Gärling and Schuitema, 2007; Steg and Schuitema, 2007). This results in a dilemma between political feasibility and policy effectiveness, where potentially effective urban policy interventions are not implemented due to political feasibility problems (Marcantonini and Ellerman, 2015; Carattini et al., 2017; Gunningham and Sinclair, 2017).

This paper investigates public acceptance and attitudes towards an urban intervention to reduce air pollution: the superblocks in Barcelona. Superblocks are groups of several blocks where traffic is almost restricted to roads around the outside, opening up the streets inside the superblock to pedestrians and cyclists. The aim of the Superblocks project is to reduce air pollution from vehicles, give residents a relief from noise pollution, create more open space for citizens to socialize and do activities. According to recent estimates, the superblocks would help reduce harmful environmental exposures (air pollution, noise, and heat) while simultaneously provide substantial health benefits for the residents (Mueller et al., 2020). We collected survey and focus groups data after the implementation of three superblocks and the announcement by the

local government of the expansion of the superblock model to the whole city. We focus our analysis on the beliefs and emotions, as well as on the socio-demographic characteristics of supporters and opponents to the superblocks.

Understanding the public acceptance of interventions to reduce urban air pollution

Understanding residents' attitudes towards urban interventions to reduce air pollution and traffic congestion has been the goal of a significant tradition of research in the social sciences. Whilst most of the research has focused on congestion charges (urban tolls levied on drivers' access to the central city area), in the context of traffic congestion regulation (Schlag and Teubel, 1997; Rienstra, Rietveld, and Verhoef, 1999; Eliasson and Jonsson, 2011; Nilsson et al., 2016; Jagers et al., 2017), research on public attitudes towards traffic calming measures is more limited. With the exception of several studies evaluating the social impact of various traffic calming measures, and especially the perception of safety (see McAdam and Aubin (2015) for a review), there are very few studies on public attitudes towards interventions such as speed limitations, increased bicycle lanes or pedestrianisation.

Based on previous research (Steg and Schuitema, 2007), we know that the attributes of the policy measure are important in terms of public acceptance. Policies aimed at improving public transport are more widely accepted than regulatory or economic measures (Nilsson and Küller, 2000; Schlag and Schade, 2000). Non-coercive measures (pull measures) are often considered more acceptable by the public compared to coercive measures (push measures), possibly because the latter reduce personal freedom. Coercive measures are often perceived as ineffective, unfair and unacceptable (Rienstra et al., 1999; Steg and Vlek, 1997), while non-coercive measures are more likely to be perceived as effective, fair and acceptable (Eriksson et al., 2006; Joireman et al., 2001; Rienstra et al., 1999). Attitudes towards infrastructural interventions, such as the superblocks, are perhaps more complex and context specific, although we have little systematic evidence on this.

Besides the specific characteristics of the intervention, there are other factors that are considered of critical importance in explaining variations in public acceptance among individuals and populations (Jagers et al., 2017; Wan, Shen and Choi, 2017; Schmitz et al., 2019; Ejelöv and Nilsson, 2020;). First, the specific beliefs that individuals hold regarding the policy (policy-specific beliefs such as perceived effectiveness, personal

and societal perceived impacts or perceived fairness), the implementation of the policy and the actors implementing the policy (perceived process legitimacy and institutional trust). Second, factors such as familiarity with the intervention, perception of the problem that the intervention is aimed at reducing, the emotions associated to the intervention, prior orientations and attitudes, political identity and ideology, personal characteristics and media framing interact also to determine acceptance (Oltra et al., 2021). As concluded by Ejelöv and Nilsson (2020) in a recent review and research agenda, “the reviewed studies indicate that demographic factors generally have small effects on acceptability, that ideology seems to be a consistent predictor among personal factors, and that policy specific beliefs may be effective in explaining acceptability but that the relative importance of the specific beliefs may vary between policy contexts”. All these factors should be relevant in the public acceptance of the superblocks.

Context: The Barcelona Superblocks project

The Superblock model developed in the city of Barcelona is an urban intervention that aims to reduce air pollution, reclaim space for people, reduce motorized transport, promote sustainable mobility and active lifestyles, provide urban greening and mitigate the effects of climate change (Rueda, 2019). Although early implementations of traffic pacification plans were developed in the 1970s, a new plan aimed at implementing a total of 503 Superblocks over the city of Barcelona was developed by the Barcelona City Council in 2013.

A superblock is a traffic-regulated group of smaller city blocks. In the outer streets, buses and car traffic circulate, while the space in the interior is reserved mainly for pedestrians, cyclists, and cars at low speed. For instance, in the Sant Antoni neighbourhood, the first phase of the implementation of the superblock program, concluded in May 2018, included the pacification of two streets (in total four sections of streets forming a cross) and the creation of a new public square in their crossing of 1800 m². In total, 5000 m² of public space was reserved for pedestrians with staying areas for new uses and a greater presence of green space, including trees and bushes. By 2021, the Barcelona City Council has implemented three Superblocks (Poblenou, Sant Antoni, Horta neighbourhoods) and is committed to an expansion of the superblock model in the Eixample neighbourhood, which occupies the central part of the city (<http://ajuntament.barcelona.cat/superilles/es>).

Figure 1. Scheme and photo of the Superblocks.



While the project has attracted enthusiastic media attention locally and internationally, the pilot superblock project in the district of Poblenou faced resistance from certain political and civil society groups. Its implementation at the beginning of September 2016 was characterized by criticism of technical and implementation limitations and of lack of citizen participation during the planning and design process spheres (Zografos et al., 2020). The development of the Superblock in the Sant Antoni neighbourhood has been generally considered more successful. According to representatives from the local government, this second big superblock has been implemented with relatively greater success and without public resistance, mainly due to the higher levels of public participation from the start of the project, the suspension of licences to prevent the installation of certain businesses, the incorporation of housing projects and flexibility in the design and its gradual application (El Periódico, 2018). However, the recent announcement of the extension of the project to the whole city of Barcelona has generated a new public controversy.

2. Methods

Study design

We conducted a survey and focus groups to understand residents' attitudes and acceptance of the superblocks. All participants were recruited from a panel managed by a market research firm. The survey was implemented online and designed to take between 5 and 10 minutes to complete. The focus groups lasted 60 minutes. More details are provided below.

Survey sample

Respondents older than 18 years old living in the area affected by the superblocks were recruited from an internet panel managed by a Spanish market research company to form a quota sample representative of the population of Barcelona. The data were collected in February 2021. The survey drop-out rate was of 5%. The final number of participants in the study was 581. Fixed quotas were used for sex and age and soft quotes for educational level, resulting in a sample with 52 percent female, 11 percent between 18 and 24 years old, 24 percent between 25 and 39, 40 percent between 40 and 64 and 24 percent older than 65 years old. 36 percent of respondents had a university degree.

Focus group sample

Four focus groups were conducted online with a total of 16 participants (8 females and 8 males) and an average of 4 participants per focus group. Participants were recruited by a local market research company and received 45 euros for their participation. Participants ranged in age from 20 to 62 years. The sample had varying levels of formal education (44% with a university degree).

Questionnaire

First, we provided information to respondents in the form of three paragraphs (three to five lines each) and three images describing the main features of a superblock and the Barcelona Superblocks project. After this introduction, the questionnaire assessed eight main domains: familiarity with the project, affect, specific beliefs, perceived legitimacy, institutional trust, overall evaluation, acceptance and support, and sociodemographics. The full questionnaire is available from the authors upon request. The following variable measures were used:

Overall evaluation of the Superblock model. It was measured utilizing the following question: “What do you think of the Superblock model as a strategy for city renewal?”. A 10-point response scale was used ranging from 0- very poor to 10- excellent.

Acceptance. It was measured utilizing the following question: “Would the extension of the Superblocks programme to the whole city of Barcelona be acceptable to you? (e.g.: extending the number of superblocks in the neighbourhoods)” with responses from totally unacceptable (1) to totally acceptable (5).

Support. Respondents were asked “Would you vote for the creation of a superblock in your neighbourhood?” A 5-point response scale was used ranging from 1- I would vote totally against it to 5- I would vote totally in favour of it.

Affect. It was measured utilizing the following two items: “The thought of living in a superblock makes me feel happy” and “The thought of living in a superblock makes me feel comfortable and at ease”. A 5-point response scale was used ranging from 1- strongly disagree to 5- strongly agree.

Perceived effectiveness. Respondents were asked “To what extent do you consider the superblock programme an effective programme to reduce the city's air pollution and traffic problems?”. A 5-point response scale was used ranging from 1- totally ineffective to 5- totally effective.

Perceived fairness. Respondents were asked “To what extent do you consider the superblock programme a socially just programme (i.e. with no negative impacts on certain groups or with negative impacts that will be compensated for)?” A 5-point response scale was used ranging from 1- totally unfair to 5- totally fair.

Perceived impacts. Respondents were asked “Thinking about the impacts of the superblocks on the residents’ wellbeing, do you consider them to be...”; “Thinking about the impacts of the superblocks on environmental quality (air quality) of the neighbourhood, do you consider them to be...”; “Thinking about the impacts of the superblocks on the personal relationships among residents of the neighbourhood, do you consider them to be...” with responses from very negative (1) to very positive (5).

Perceived process legitimacy. Respondents were asked “In general, do you think that the implementation of the superblocks programme in Barcelona is being democratic (the opinion of the neighbours is being taken into account)” with responses from not at all democratic (1) to very democratic (5).

Institutional trust (1-5). Respondents were asked “Do you think the current local government in Barcelona is capable of making good decisions on the problem of air pollution?” with responses from definitively not (1) to definitively yes (5).

Focus group procedures

Focus groups were semi structured and facilitators took a flexible approach; questions were asked to guide the group through the relevant topics, whereas unanticipated ideas

that emerged in the discussion were also pursued. The focus groups' aim was to elicit participants' beliefs and emotions associated to superblocks. At the beginning of the group discussion, we provided to participants very simple information on the main features of the superblocks. The semi structured focus group guide covered the following dimensions: initial reaction, emotions, perceived impacts, perceived attributes, perceived legitimacy, trust, support, preference for alternatives.

Analysis

For data analysis, we used frequencies and cross-tabs for descriptive and comparative analysis. For the comparison between supporters and opponents of superblocks, those participants that voted (1) totally against and (2) probably against a superblock in their neighbourhood were placed in the "against" group (i.e. opponents). Those that voted '(4) probably in favour of' or '(5) definitely in favour of' were placed in the "in favour of" group (i.e. supporters). Those that were neutral (3) are excluded from the comparative analysis reported in this paper. Of the 501 respondents, 220 respondents were considered opponents and 187 supporters. Pearson's χ^2 test and Student's t-test were used to evaluate the differences between opponents and supporters. All statistical analysis was conducted with SPSS version 20.0 (IBM SPSS).

For qualitative data analysis, we conducted a thematic analysis of focus group discussions exploring four general dimensions: beliefs about the attributes and impacts of the superblocks, associated affect, perceived process legitimacy and institutional trust. Recordings were transcribed verbatim without identifying information. Two members of the research team read all transcripts and identified themes. Codes and subcodes were generated from a priori model as well as inductively. The analytic team met to discuss emerging themes, define codes, and draft a coding manual. The analysis of the excerpts was assisted with MAXQDA version 12.

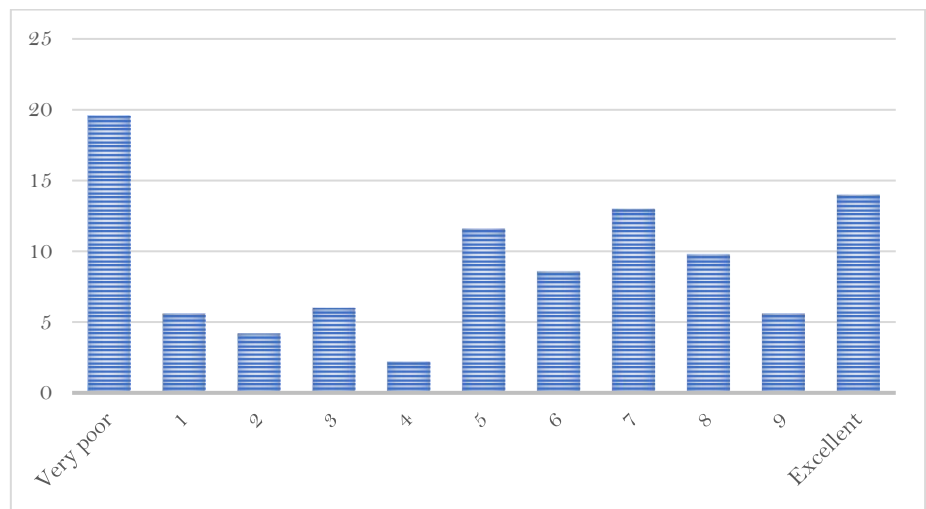
3. Results

Overall evaluation and acceptance of the Superblocks

Figure 2 shows the overall evaluation by respondents of the Superblock model in a scale from very bad (0) to excellent (10). The results show a non-symmetric distribution of responses: 20 percent of respondents rated the Superblock model as a very good or excellent option (values 9 and 10) whilst 26 percent of respondents rated the

Superblocks as very bad model (values 0 and 1). Overall, 38 percent of respondents provided a negative evaluation of the superblock model (values 0 to 4) whilst 51 percent provided a positive evaluation (values 6 to 10) of the model. Around 20 percent of respondents provided a neutral evaluation of the Superblocks (values 4 to 6).

Figure 2. Overall evaluation of the Superblocks model by respondents (in %, scale 0 to 10)



After this initial evaluation, we asked participants if they would vote in favour or against the creation of a superblock in their neighbourhood. Participants responded on a 5-point scale ranging from “I would vote totally against” to “I would vote totally in favour”. We also asked participants if they would consider the extension of the Superblock model to the whole city an acceptable policy. Participants responded on a 5-point scale ranging from “Totally unacceptable” to “Totally acceptable”. In Table 1, we display the percentage of participants who indicated that they would vote against or in favour of a potential superblock in their neighbourhood as well as the percentage of participants who considered the extension of the model as an acceptable or non-acceptable policy. The results show that almost 4 out of 10 respondents (37 percent) stated that they would vote in favour of the implementation of a superblock in their neighbourhood whilst another 4 out of 10 respondents would vote against it (44 percent). Around 20 percent of respondents were unsure about this. Regarding the extension of the model to the whole city, the results were very similar (34 percent

considered the model acceptable versus 44 percent that considered it unacceptable), with a very similar number of participants reporting an undecided or neutral position (22 percent).

Table 1. Overall evaluation of the Superblocks model by respondents (in %, scale 0 to 10)

Support for a superblock in the resident's neighbourhood			
		IC95%	
	%	Inferior	Superior
Totally against	33	28	37
Against	11	9	14
Neutral/undecided	19	16	22
In favour	14	12	18
Totally in favour	23	19	27
Total	100%		
Acceptance of the superblock model for the city			
		IC95%	
	%	Inferior	Superior
Totally unacceptable	29	25	33
Unacceptable	14	11	17
Neutral/undecided	22	19	26
Acceptable	14	11	18
Totally acceptable	20	16	24
Total	100%		

Factors associated to support for the Superblocks

Table 2 shows the characteristics and levels of self-reported positive affect, perceived effectiveness, perceived benefits, perceived process legitimacy and institutional trust for supporters and opponents of superblocks. Regarding the sociodemographic characteristics, relevant differences between supporters and opponents included sex (55 percent of supporters were female versus 45 percent of opponents), residence close to a superblock (30 percent of supporters resided close to a superblock versus 17 percent of opponents), car ownership (31 percent of supporters had a car versus 44 percent of

opponents), age (30 percent of supporters were between 25-39 years old versus 18 percent of opponents) and ideology (average of 3.67 for supporters versus 4.21 for opponents). Relative to opponents, supporters of superblocks were younger, more likely to be female, more likely to live near a superblock, not own a car and position themselves on the left side of the ideological scale. The differences were weak for sex (Cramer V= 0,10; p= 0,04) to medium for car ownership (V= 0,34; p= 0,00).

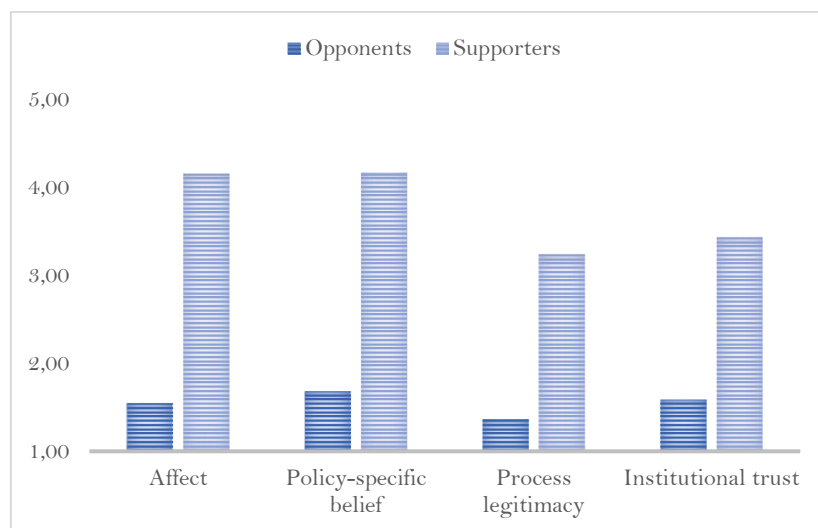
Table 2. Differences in main study variables between supporters and opponents

	Opponents	Supporters	Eta/Cramer V	p-value
Hedonic tone	1,52	3,96	0,82	0,000
Relaxation	1,55	4,16	0,84	0,000
Perceived effectiveness (1-5)	1,68	4,17	0,80	0,000
Perceived fairness (1-5)	1,62	3,81	0,78	0,000
Perceived impact1: residents' wellbeing (1-5)	2,05	4,19	0,77	0,000
Perceived impact2: social relationships among residents (1-5)	2,16	4,06	0,71	0,000
Perceived impact3: environmental quality (1-5)	2,20	4,40	0,75	0,000
Perceived process legitimacy (1-5)	1,37	3,24	0,73	0,000
Institutional trust (1-5)	1,59	3,43	0,67	0,000
Sex (% women)	45	55	0,10	0,043
Resides close to a superblock (%)	17	30	0,17	0,002
Car ownership (% yes)	44	31	0,34	0,000
Ideology (1-10)	4,21	3,67	0,14	0,005
Age (%25-39)	18	30	0,18	0,001

When comparing supporters and opponents of superblocks (Figure 3) in the main study variables, we found very strong differences in self-reported affect associated with the superblocks (Cramer V= 0,82; 0,84; p= 0,00), perceived effectiveness of the superblocks (V= 0,80; p= 0,00), perceived fairness (V= 0,77; p= 0,00), perceived benefits (V= 0,77, 0,71, 0,75; p= 0,00), perceived process legitimacy (V= 0,73; p= 0,00)

and institutional trust ($V=0,67$; $p= 0,00$). Relative to opponents, supporters reported significantly more positive affect associated to the superblocks, perceived the superblocks to be more effective for reducing air pollution and improving residents' quality of life, were more likely to perceive the social impacts of the superblocks as more fair, had a more positive perception regarding the environmental and societal impacts of the superblocks, had higher levels of institutional trust and were more likely to consider the implementation of the superblock program as legitimate. All the differences were strong and statistically significant.

Figure 3. Differences in main study variables between supporters and opponents (average, scale 1 to 5)



Results from the focus groups

Opponents and supporters in the focus groups also reported different affects and beliefs regarding the superblocks (Table 3).

Affect

While participants in favour of the superblocks reported positive emotions associated to the enjoyment and pleasantness of the superblocks, opponents tended to report negative emotions such as anger or frustration. Positive emotions of enjoyment were mostly related to memories of past times when people were more outdoors and to the fact that children can play outside. A participant from one group explains it as follows: "Yes, I found it endearing because it was like in the old days, in terms of taking the children to

play outside, in the street, right in front of the house. Well, it reminded me that they were trying to go back to that feeling of taking the children out into the street again, so that in the same neighbourhood they could interact more with each other. It gave me positive feelings of how nice or how much fun. I also tell you about the colours, how they tried to decorate everything, so that the children would feel comfortable and happy. Negative emotions among participants were linked to the perception of negative impacts on daily life, for example, on mobility: "moving around with a car is a direct torture", but also to a lack of understanding about the project and a lack of involvement in the implementation process: "In Poblenu people were very angry first because they didn't understand it, then because they didn't know where to go".

Table 3. Extracts from the focus groups (by dimension and level of acceptance)

Affect	
<i>Supporters</i>	<i>Opponents</i>
"Yes, I found it endearing because it was like in the old days, like taking the kids outside to play in the street, right in front of the house. So this is like it reminded me that they were trying to go back to that feeling of taking the children out into the street and having them interact more with each other in the same neighbourhood. At the beginning it gave me positive feelings of how nice or how much fun. I'm also telling you about the colours, how they tried to decorate everything, to make the kids feel comfortable and happy."	"In Poblenu people were very angry first because they didn't understand, then because they didn't know where to go" "Moving around by car is torture outright."
Perceived effectiveness	
<i>Supporters</i>	<i>Opponents</i>
"These are like little grains of sand because they're supposed to be planting a lot of trees and if cars drive less and at less speed we'll	"I honestly don't think so. I personally don't think so. So maybe it won't create pollution at this junction, but it's going

<p>get something I say, I don't know, it's not the panacea either..."</p> <p>"It doesn't have to, because if you reduce traffic in a specific area, at the moment in that area you may have eliminated, I don't know, 1000 cars that are no longer polluting because, because they no longer pass through there..."</p>	<p>to be in the rest of the neighbourhood, you know?</p> <p>"The superblocs don't eliminate traffic, there will be exactly the same number of cars, there will just be more congestion in the surrounding streets so there will be more pollution."</p>
Beliefs- perceived impacts on wellbeing	
<i>Supporters</i>	<i>Opponents</i>
<p>"I see benefits for mental health, a more comfortable neighborhood to live in, being able to walk without fear of cars, all this makes you happier"</p>	<p>"They are areas of great insecurity, because when it is dark there is no one there, there is no life or movement, this situation increases the feeling of danger and the hold-ups, because they are ghostly areas.</p> <p>"The stress caused to people by not knowing where to go, having to be attentive to 10 different signs (road, vertical...) where before there were two, and with all this increase the time of transport to work or other places, taking time away from family conciliation or leisure".</p>
Beliefs- perceived impacts on social life	
<i>Supporters</i>	<i>Opponents</i>
<p>"As the superblocs are closed off to prevent cars from passing through, I suppose it would be easier to hold, I don't know, parties or neighbourhood parties, or birthday parties or anything else".</p>	<p>"That will sound like shit full of people lying on benches lazy, others chatting loudly, or groups of" smoking "animals just thinking about it already makes me headache."</p>

"The superblocks are for the residents there, who like to go out for a walk, they like a more collective and more united atmosphere between different buildings".	
Beliefs- perceived impacts on mobility	
<i>Supporters</i>	<i>Opponents</i>
<p>"Access for residents in special conditions, mobility by car for handicapped persons".</p> <p>"Access for emergency teams...".</p> <p>"Access to homes with private transport for residents".</p> <p>"Parking spaces for people who must have a car to move around".</p>	<p>"They hinder the emergency passage through the overpass already denounced by the Poblenou fire brigade".</p> <p>"They take traffic from one part and multiply by 2 in the rest of the streets"</p> <p>"Mobility around the city in a private vehicle for work is more difficult"</p>
Beliefs- perceived impacts on the economy	
<i>Supporters</i>	<i>Opponents</i>
<p>"I think it can be a good thing as people will be able to walk around more and enjoy the shops more."</p> <p>"Business have more people walking on the street".</p>	<p>"The lack of customers in the businesses that have been forced to close due to lack of visibility, as they are isolated and forgotten due to the lack of traffic".</p> <p>"Businesses have collapsed, especially garages and car dealerships, as well as other businesses that have had to close due to the lack of access to cars. I am referring to the Superillas in the Pueblo Nuevo area".</p>

Perceived fairness	
<i>Supporters</i>	<i>Opponents</i>
<p>"Superblocks are fairer [than the LEZ] in the sense that whether you have a Mercedes or a car, you're the same, you can't pass"</p> <p>"People without economic resources can go out of the house and there is a table where they can have a picnic, they can eat, there are squash tables where the children can play; they don't need to spend money to go far away but they have it close to home and can use it and make society a little more egalitarian".</p>	<p>"If you focus on this project it means that you will work on this project, you will not be working for the whole of Barcelona and this will make the Eixample, if it is already difficult to live there, impossible or even impossible".</p> <p>"By creating a superblock you transfer traffic, noise and increased congestion to the roads that are left for circulation with a comparative disadvantage between residents of the supermarket and residents living near the supermarket".</p>
Perceived legitimacy	
<i>Supporters</i>	<i>Opponents</i>
<p>"The participatory processes have disappointed me a lot, then only entities and people who are very involved.... I am in some of them and I am clear about it".</p> <p>"But it's true that changes were made, that it's true, that it's not like it was on the first day. It is also true that they called us and we were holding meetings with the City Council and they were asking us what we wanted, how we wanted it, they didn't pay attention to us in everything, but well, at least they asked, that's something".</p>	<p>"Changes do not have to be made in offices, there is an organic reality and the habits of the citizens cannot be changed in 24 hours. Barcelona must be for the people of Barcelona and decisions must also be taken by the citizens".</p>
Institutional trust	
<i>Supporters</i>	<i>Opponents</i>

<p>"At least in the last few years they have started to implement things, perhaps starting always with small things, the two superhighways and the low emission zone, but at least they are planting more vegetation and trying to reduce traffic. And I imagine that I haven't seen the results whether they are achieving this satisfactorily or not, but at least at first glance they have improved the areas of the city that they have tried with the superslopes and to reduce the traffic of cars".</p>	<p>"I am concerned that this council only listens to itself and not to the priorities of this city, shame on the mayor's office".</p> <p>"The incompetence and corruption of our leaders only brings problems to the population."</p>
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Policy-specific beliefs

Supporters in the focus groups perceived the superblocks as an effective intervention to tackle air pollution and other urban problems. They also perceived the impacts of the superblocks on residents' well-being, the local economy and, above all, on the social life of residents as positive. Supporters in the focus groups referred to the positive impacts of the superblocks on residents' well-being, linked to the possibility of being able walk in the street and to let children play quietly in the street. Negative impacts on well-being were linked to the increase in travel times, insecurity, and the perception of confusion in the organization of the street.

In terms of the impacts on social life, supporters referred to an improvement in social relations between neighbours and in social life in general of those who make use of them, since they considered that the superblocks favoured community meetings and recreational uses. One participant mentioned: "I consider all the impacts to be very positive. For me it is the way to achieve a healthy city, without pollution, diverse, with meeting spaces and respect for uses and activities, which puts citizens at the centre to make the "Right to the City" a reality". Opponents mentioned the negative impacts on social life, related to the presence of "unwanted" people in the areas of the superblocks. The following extract clarifies what some participants point out in this sense:

"Dangerous, anti-social, marginalised groups gather there, causing more noise, more dirt and more insecurity in the neighbourhood".

Regarding the potential economic impacts of the superblocks, those in favour mentioned that the superblocks improve the health of the local business in the neighbourhoods, as there are more people walking in the streets. On the other hand, opponents considered that the lack of road traffic leads to a loss of customers for certain businesses, as they become less visible and inaccessible by car. Both supporters and opponents discussed the negative impacts on mobility. These negative impacts were of four types: extra difficulties for people with disabilities, difficulties for emergency vehicles and other basic services, the concentration and increase of traffic in surrounding areas, and parking difficulties for neighbours.

Finally, regarding the perception of fairness associated to the impacts of the superblocks, supporters and opponents reported very different perceptions. Citizens in favour of the superblocks generally considered the superblocks as a fair measure. They compared it directly with the recently implemented low emission zone (which they clearly perceive as much more unfair) and provided arguments related above all to the equal effects of the measure for all the socio-economic groups, i.e. they perceived that it does not affect citizens with fewer economic resources more. Some participants even refer to the fact that the measure especially benefits citizens with lower incomes. On the other hand, opponents stated that superblocks are clearly unfair and might produce gentrification, inequality between neighbourhoods, public spending on very specific and localised measures, very negative impacts for transport operators and limitation of the right to free movement.

Process legitimacy

The majority of participants mentioned that the residents were not sufficiently consulted before the implementation of the superblocks and therefore perceived the process as non-democratic. Both the participants in favour of the superblocks and those against seemed to agree on this perception. Some of the more favourable participants referred to the meetings between neighbours and the City Council. Opponents mentioned the lack of information to neighbours and the speed with which it was implemented, especially regarding the Poblenou superblock. Most of the opponents mentioned the lack of active listening on the part of the City Council: "Changes do not have to be made in offices,

there is an organic reality and the habits of the citizens cannot be changed in 24 hours. Barcelona has to be for the people of Barcelona and decisions must also be taken by the citizens".

Institutional trust

Supporters of the superblocks mentioned that the city council "does what it can" or "does no more because it can't", whilst opponents highlighted various aspects why they do not trust the city council: incompetence, corruption and failure to listen to citizens. In this sense, one citizen commented: "The incompetence and corruption of our leaders only brings problems to the population". Another participant mentioned: "I am concerned that this council only listens to itself and not to the priorities of our city, shame on the mayor's office". Perceived incompetence was related to ideological issues, as some participants perceive that ideology, and not science, is guiding their decisions around the superblocks.

4. Discussion

The present study aimed at understanding citizens' attitudes and acceptance of the superblocks. The Barcelona Superblock model is a promising urban intervention with the potential to reduce premature mortality burden and increase residents' wellbeing through reductions in air pollution, noise and heat and increased access to green space (Mueller et al., 2020). Based on a survey and focus groups, we measured the level of acceptance of this urban intervention among residents in Barcelona and explored, following previous research (Eliasson and Jonsson, 2001; Ejelöv and Nilsson, 2020; Jagers et al., 2017), the role of various individual-level covariates of acceptance. We specifically examined the role of policy specific beliefs and emotions, institutional trust and perceived process legitimacy as well as sex, car use and political ideology in driving support and opposition to the superblocks.

The results first showed a significant polarization in the public acceptance of the superblocks. Around 4 out of 10 respondents in the study would vote in favour of the implementation of a superblock in their neighbourhood whilst another 4 out of 10 respondents would vote against it. A significant proportion of the residents rated the superblocks as an excellent idea. But another significant proportion of the residents considered the superblocks a very poor intervention. This polarization of responses was somehow unexpected given the enthusiastic initial media to the superblock project, that

emphasized the promising benefits of the superblocks in terms of substantially reducing automobile traffic, air pollution and GHG emissions while increasing green space in the city and improving the health and quality of life of its inhabitants without investments in hard infrastructures or massive developments (López et al., 2020; Mueller et al., 2020). Several factors might have played a role in this polarization of responses, such as the tendency among parts of the public to strongly oppose policies that limit and/or increase costs of motorised private transport, in contrast to policies aimed at expanding capacity for private and public transport (Wicki, Huber and Bernauer, 2020), the problems and the controversy around the implementation of the first superblock in the city (Zografos et al., 2020), the political polarization around the local government, given the relevant role of ideology and party identification in acceptance (Hårsman and Quigley, 2010), and the recent controversial decision to expand the superblock model, with significant alterations, to the whole city.

Second, the comparative analysis showed that relative to opponents to the superblocks, supporters were younger, more likely to be female, more likely to live near a superblock, not own a car and position themselves on the left side of the ideological scale. Supporters reported significantly higher levels of positive affect, perceived the superblocks as more effective to tackle air pollution, as fairer, more beneficial for the local environment, the quality of life of the residents and the social life of the neighbourhoods, had higher levels of trust in the local government and perceived the implementation of the superblocks project as more legitimate. Consistent with previous research, policy-specific beliefs, perceived process legitimacy and institutional trust were strongly associated to acceptance of the superblocks (Jagers et al., 2017).

Sociodemographics, as expected based on previous research (Eliasson and Jonsson, 2001; Ejelöv and Nilsson, 2020), were significantly but weakly to moderately linked to acceptance. Interestingly, emotions were strongly associated to acceptance of the superblocks. Supporters of the superblocks reported feeling happier when they were around a superblock. Opponents, on the contrary, tended to feel angry about the idea of the superblock. Given that previous research on the public acceptance of policies to reduce urban air pollution has paid little attention to the role of emotions, further research should be conducted on this topic (Nilsson et al., 2016; Ejelöv and Nilsson, 2020).

There are some limitations to our study. First, the characteristics of our sample might limit the generalizability of the results. It cannot be expected that Internet surveys based on quota sampling and general populations will produce results equivalent to those from non-Internet surveys. Second, we were not able to collect many responses from citizens residing in a superblock. Although we were not particularly interested in researching the differences in attitudes between residents and non-residents, this is a topic worthy of further investigation, as it could provide new insights into the role of familiarity and the status quo bias in acceptance (Börjesson, Eliasson and Hamilton, 2016) in the context of traffic pacification interventions. Finally, while most variables used in the study were measured with high face validity, some of the measures could be improved. In general, it may be worthwhile to study more in depth the social dynamics that may be underlying our findings about acceptance and opposition to the superblocks.

Conclusion

In this paper, we investigated the public acceptance of the superblocks. Using the case of the Barcelona Superblocks project and based on a survey and focus groups among residents in Barcelona, we can conclude, first, that interventions may generate a significant polarization of responses among the residents; and second, that policy-specific beliefs, affect and opinions on process legitimacy and institutional trust play a significant role on acceptance. We also note that personal characteristics such as political ideology, car ownership, age and sex are also significantly associated with levels of acceptance. Our findings offer new insights into how citizens form attitudes with respect to policy interventions to reduce urban air pollution.

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