

# PUBLIC SPACE AND ENVIRONMENTAL BEHAVIOUR: WEEKLY MARKETS IN HAMBURG, GERMANY

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## ABSTRACT

Limiting warming to 1.5°C above pre-industrial levels requires a large-scale effort to promote sustainable behaviour. The surrounding environment has a determinant influence on human behaviour and can therefore become a strategic ally towards sustainability. Using a multi-method approach in two weekly markets in Hamburg, this paper analyses how different features of the public space – like accessibility – facilitate the implementation of strategies typically aimed at the promotion of environmental behaviour – like information. The analysis shows that the two settings enable the implementation of all the revised strategies, pointing out the relevance of the public space towards more sustainable cities. Physical access in terms of public transportation and free-barrier zones played a major role facilitating the implementation of all the revised strategies while symbolic access in the form of a sophisticated atmosphere suggested a barrier for low-income groups. Visual access and opportunities for socio-cultural exchange acted together: The environment influenced behaviour through social norms-based strategies via observing what others do, role model-based strategies via sellers and information-based strategies via the spread of different types of information. In the same way, it drove subconscious decision-making throughout salience and priming-based strategies in the form of an extensive usage of signage. Regarding opportunities for economic exchange, availability-based strategies in the form of products and services played a major role, in accordance with the commercial nature of the markets. Opportunities for sensory experiences were supported by a variety of elements that created full lived-in experiences like smells and live music, which in turn might enhance the desired effect. Concerning situational features, the analysis suggests that a linear arrangement of stands provides quicker and easier access to products compared with a grid form.

*Keywords:* public space, environmental behaviour, behavioural change, sustainable cities, street markets.

## 1 INTRODUCTION

Generalized individual pro-environmental behaviour is particularly desirable in cities, which house more than half of the world's population and emit 80% of the greenhouse gasses [1]. The need to accelerate the transition is urgent but how to do it remains a puzzle. Part of the problem stems from the numerous and diverse barriers hindering environmental behaviour, which range from the lack of knowledge, individual attitudes and motivations [2] to problems dealing with the difficulty, time consuming, or cost of the behaviour [3]. Previous research suggests the combination of different strategies aimed to overcome different barriers for better outcomes [3], [4]. How to combine the different strategies and where to do it? The public space is a *neutral* scenario for communication, social learning, personal development, and various types of exchange [5]. There is where behaviours are more likely to follow the *status quo*, shaping individual decisions through automatic, unconscious cognitive processes [6] and therefore represents an opportunity to implement wide-ranging environmental strategies through social contagion.

*Active engagement* is one of the main functions of the public space, involving the active participation of individuals. Both, spatial arrangements and opportunities for action have been found to play an important role driving behaviour, especially concerning the interaction between individuals [7]. While the relevance of the public space as a behavioural setting has



been established, little is still known about the potential of the public space to promote environmental behaviour.

Drawing on environmental psychology, this study adds to previous research analysing the potential of different features of the public space facilitating the implementation of strategies typically aimed at the promotion of environmental behaviour. More specifically, it identifies strategies that are already running in the public space and establishes the link with the features of the space that facilitate their implementation, showing the potential of the public space as a forum for the promotion of environmental action. Empirical material is presented from a multi-method approach of two weekly markets in Hamburg. Locations were selected based on the observation that markets are very popular places where different behavioural strategies – as *social norms* – take place, thus providing optimal conditions for the promotion of environmental action on a large scale.

This article adds to the current literature on public space and behavioural change in several ways. First, based on in-depth qualitative research, it provides a detailed understanding on the potential of the public space for the implementation of strategies typically used to promote environmental behaviour, asserting its role as a main driver towards sustainable cities. Furthermore, it provides interdisciplinary understanding of the relationship between public space, and environmental behaviour. Second, the study focuses on weekly markets, that is, popular urban settings in terms of number and human activity. In doing this, the function of the public space as a forum for action is claimed, presented as a feasible alternative that responds to the current need for the spread of environmental practices on a large scale in the fastest possible way. Furthermore, it shifts the focus from the *making* places for people to enjoy and interact to the *making* places for people to take environmental action. Third, the study provides theoretical–practical insights into the link between strategies and the features of the public space facilitating their implementation, thus providing practitioners with daily life examples that can be maximized or redirected towards sustainability.

The article begins by discussing the literature on behavioural strategies used to overcome environmental barriers and features of the space that might facilitate their implementation. This is followed by the methodology and analysis, providing valuable insights into the relationship between the surrounding environment in the markets and ongoing behavioural strategies. The last section draws conclusions and discusses the main findings.

## 2 STRATEGIES TO FACILITATE ENVIRONMENTAL BEHAVIOR

Individual behaviour plays a significant role in reducing greenhouse gas emissions [8] but the required behavioural shift poses major challenges as it is driven by multiple conflicting and competing internal and external factors *or barriers* [2], [3]. Internal barriers refer to factors lying within the person as knowledge or motivation [2]. External barriers or *contextual forces* include a wide range of factors as infrastructure, costs, advertising, capabilities and constraints associated with technology, and or institutional issues [3] but also availability of products and services [9] as well as social forces as norms, reputation systems and social networks [10]. Furthermore, the *how* different interventions are framed and communicated also influences decision-making processes [6]. In the remainder of this section, some of the most influential strategies aimed to overcome internal and external barriers are presented. This is followed by the presentation of features of the public space that might facilitate their implementation.



## 2.1 Information and knowledge

Knowledge *per se* is neither a prerequisite for environmental action [2] nor sufficient to motivate action [2], [11]. However, it is widely recognized as one of the most important factors influencing environmental action as nothing occur unless information makes individuals aware of the different opportunities for action [12]. Information influences individual perceptions, motivations, and norms [9], but also attitudes, beliefs and values [3] which in turn might influence behavioural choices. Research shows that information might be more effective when the individual has the *skill* to apply knowledge [3], [13] and it is familiar with the environmental problem and its causes [2]. In the same way, results are best when information is presented at time and place where the intended behaviour will occur and people similar to the target audience model it; if it comes from a trusted source or it is accompanied by a request for a public commitment; if it reminds people that there are norms supporting the desired behaviour, and also when it gains people's involvement and attention [3]. Information is more effective when it is accurate, credible, and targeted at the point of decision, thus suggesting concrete actions be taken according to participant's personal situation and preventing information overload [8].

## 2.2 Social norms

Descriptive norms refer to perceptions of which behaviours are typically performed in a given situation, placing the idea of *many people are doing this* in our mind [14]. In this line, pro-environmental behaviour is less likely to occur within a culture that propagates an unsustainable lifestyle [2]. Injunctive norms refer to perceptions of which behaviours are typically approved or disapproved [14] involving behavioural expectations that are supported by social or material sanctions [10]. People measure the rightness of their behaviour by how far away they are from the norm [15], and avoid deviance, as people tend to do what is popular as well as what is socially approved [14]. Byerly et al. [6] conducted a review dealing with the influence of different contextual variables on individual's decisions, finding out consistent effects on environmental behaviours by interventions communicating social norms.

## 2.3 Availability

Internal factors as attitudes are of great relevance predicting behaviours that are strongly favoured by context but their relevance declines when external factors as cost, effort, difficulty or time-consuming constrain the behaviour [3]. Moreover, some behaviours as recycling or taking public transportation can only take place if the necessary infrastructure is provided [2]. External barriers can be approached by providing clear and accurate information e.g. informing people of recycling facilities locations or by facilitating action in strictly practical terms, thus making the behaviour more convenient e.g. placing containers in close proximity to common activities to motivate action [13]. In the same way, attitudes towards organic food might improve when prices decrease [9]. This underlines the need of changes in physical, technical, and/or organizational systems aimed at the improvement in availability and quality of the desired products and services as well as the restriction and/or prohibition of unwanted actions towards successful interventions [9]. Other ways to deal with external factors include civic engagement and participation [2].



## 2.4 Priming and salience

Differences in the context can have a powerful effect on behaviour through automatic, unconscious processes [16]. In this way, people respond to information that is made accessible in their mind via priming through subconscious information and sensory cues, like clearly visible and numerous displays of fresh food aimed to motivate purchases towards healthy food. In the same way, people react when their attention is repeatedly drawn via salience, through reminders and message framing capturing attention, like visually attractive and friendly signs promoting energy saving placed next to light switches [6].

## 2.5 Role model

Individual decisions can be influenced by a careful choice of the person or *messenger* encouraging certain behaviour, as information is more effective when the person suggesting the action is perceived as similar [6]. Role model-based strategies can be also used to strengthen social norms by providing information about the expectations [6] perceptions, efficacy, and behaviour of others [9].

# 3 THE PUBLIC SPACE AND ACTIVE ENGAGEMENT

It is widely recognized that successful places are characterized by high levels of activity and participants, which in turn presents an opportunity for active engagement and participation. According to Max-Neef et al. [17], *participation* is a human need that could be met through actions involving adaptability, receptiveness, solidarity, willingness, respect, rights, responsibilities, duties, work, cooperation, propose or interaction. The rest of this section covers different attributes of the public space that might facilitate the implementation of behavioural strategies typically used to promote environmental behaviour. That is, attributes of *successful* public spaces that might encourage active engagement and participation.

## 3.1 Accessibility

Carr et al. [18] explained the concept of accessibility from three different perspectives. *Visual accessibility* refers to what people can see and judge before taking any further steps and it is many times the first contact between an individual and a given place. A personal evaluation might include feeling of comfort, welcome and safety. The visual experience includes information about *symbolic access*, associated with *animate* (e.g. a friendly group of people) and *inanimate* (e.g. exclusive shops sending signs about the ability to pay or to meet dress norms) cues from the environment indicating the type of individuals that are welcome or excluded. Finally, *physical access* refers to the physical ability to get into and use a given place. It includes different forms of public transport making places accessible to all groups in society as well as physical elements welcoming or excluding people as slippery pavements, walls, elements inhibiting sitting or the lack of ramps for elderly and trolleys [7].

## 3.2 Opportunities for exchange

According to Montgomery [19], the level of activity depends on the diversity of a given place in terms of the type and number of socio-cultural and economic transactions available, which in turn might increase its *vitality* in terms of the number of people around. Montgomery [19] identifies high levels of economic activity as key for success. Ideally, a given setting includes a wide range of offers and activities (e.g. cafés, foreign grocery stores, delicatessens, and cinemas), slots of time, networks of suppliers and customers, and the building up of new



products and services [19]. Socio-cultural transactions include social interaction, communication, civil participation and different forms of social learning and personal development processes [7].

### 3.3 Opportunities for sensory experiences

Lived-in experiences in a given place are associated with sensation and perception processes triggered by the surrounding environment. Sensation involves input to the brain obtained by all human senses. While vision provides more information than the other senses combined, information gathered by other sensory receptors as ears, nose, and mouth create opportunities for emotionally rich experiences. Perception refers to the understanding and processing of the information received. It involves cognitive processes organizing and keeping information, interpretative processes involving associations between current and past experiences, affective processes involving feelings and evaluative processes dealing with individual values and preferences [7].

### 3.4 Situational features

Drawing on previous work, Carmona et al. [7] concluded that human behaviour is essentially *situational* as it is shaped by specific physical, socio-cultural and perceptual contexts. While the last two affairs were explained above, the physical environment refers to spatial arrangements that influence individual's choice by determining what people can do or not from a practical viewpoint. For example, a bench placed in a nice place offers an opportunity for a long stay, showing that the desired outcomes are more likely to occur in certain settings. In summary, individual choice might be the result of the influence of the surrounding environment in combination with a wide set of individual parameters, ranging from personal experiences to age, lifestyle or the society in which a person was raised up [7].

Based on the theoretical framework, we hypothesize that weekly markets are places that meet attributes of successful public spaces attracting people and offering opportunities for action through the implementation and ongoing of behavioural strategies.

## 4 METHODOLOGY

Direct observation in two weekly markets in Hamburg, Germany, was the main research method to explore the link between features of the public space and ongoing behavioural strategies. The popularity of the markets and their big size were among the main selection criteria to select the study sites, ensuring a rich exchange between individuals and space. *Isemarkt* is located in the wealthy neighbourhood of Eppendorf. According to its website [20], it is one of the largest and most beautiful markets in Germany, with about 178 market stands following an about 600m straight-line pattern. *Billstedt market* is located in the neighbourhood of Billstedt, the commercial heart of a densely populated low-income district. The street market counts around 67 market stands following a block pattern subdivided into small plots. An important difference between the two neighbourhoods is the number of migrants, which in turn influences the type of visitors to the markets. According to the German Federal Statistical Office [21], the percentage of migrants is 21.7% (4.4% from Turkey, 7.9% from Poland, 1.7% from Afghanistan) in Eppendorf and 61.2% in Billstedt (18.1% from Turkey, 14.0 from Poland, 13.5% from Afghanistan).

Direct observation was performed at irregular intervals over a period of 8 months (July 2021–February 2022). The observers spent an average of 2 hours per visit on site observing the social and physical environment. The observations focused on three main issues: the



existence of the selected characteristics of the space facilitating active engagement, the ongoing selected behavioural strategies, and their interlinkages. The information was inputted into forms produced by the author for that purpose and supported by photographic material. Participant observation included having drinks in the market's restaurants, grocery purchases and informal conversations with the sellers and market visitors. Finally, short, structured interviews were conducted with the market inspectors, buyers and sellers. These interviews provided general information about organizational issues, motivations to visit the market as well as on green selling and consumption practices.

## 5 ANALYSIS

The analysis is conducted in two steps: first, it identifies what features of places that might facilitate the implementation of different behavioural strategies are met. That is, it identifies the existence of features of public spaces that might encourage action. Second, it explores how the different features facilitate the implementation of the different strategies. For a summary overview of the relationship between features of the public space and behavioural strategies along with a graphic representation, see Figs 1 and 2.

### 5.1 Accessibility

#### 5.1.1 Physical access

Two days a week: Tuesdays and Fridays from 8–12 am, *Isemarkt* market is placed under a bridge connecting two subway stations. As a result, there is a constant flow of people coming and going between the stations. Barrier-free subway stations enable all social groups to get into and use the place. A uniform and smooth concrete surface facilitates the mobility of persons (e.g. vehicles for persons with disabilities and supermarket trolleys) and goods. Bus stops and bike stations on every side of the market along with a central bike parking and bike racks along the street, enrich the range of environmentally friendly transport possibilities. Customers and sellers may park on both sides of the street.

*Billstedt* market is located within a 6-minute walk from the largest public transport station (bus and underground) in that district. Additionally, the largest shopping centre in the area is located next to the transport station, which ensures a constant flow of people moving between the station, the shopping centre and the street market. The barrier-free transport station not only ensures easy access to the place for all groups in society, but also facilitates the mobility of goods (e.g. supermarket trolleys). In the market, a significant presence of people with disabilities was observed, despite the disruption of the free flow of people by elements as uneven surfaces, light poles, bike racks, trashcans, and tree protection elements. There are several bicycle parks located in different parts of the square, facilitating access from different directions. The largest bike parking is located in a very central place and visible to everyone. Customers and sellers may park on the side streets.

#### 5.1.2 Visual/symbolic access

*Animate and inanimate* cues in *Isemarkt* include friendly sellers – many times original growers happy to discuss about their products – and delicately decorated market stands. The numerous cafes and restaurants where people can take a break or meet someone, add to the friendly atmosphere that invites participants to take further steps. It is particularly difficult to find a place to sit down around noon, when pupils and workers take advantage of the closeness to the subway to join the market for lunchtime. The eye cannot overlook the very numerous attractive labels highlighting both the ecological quality of the different products



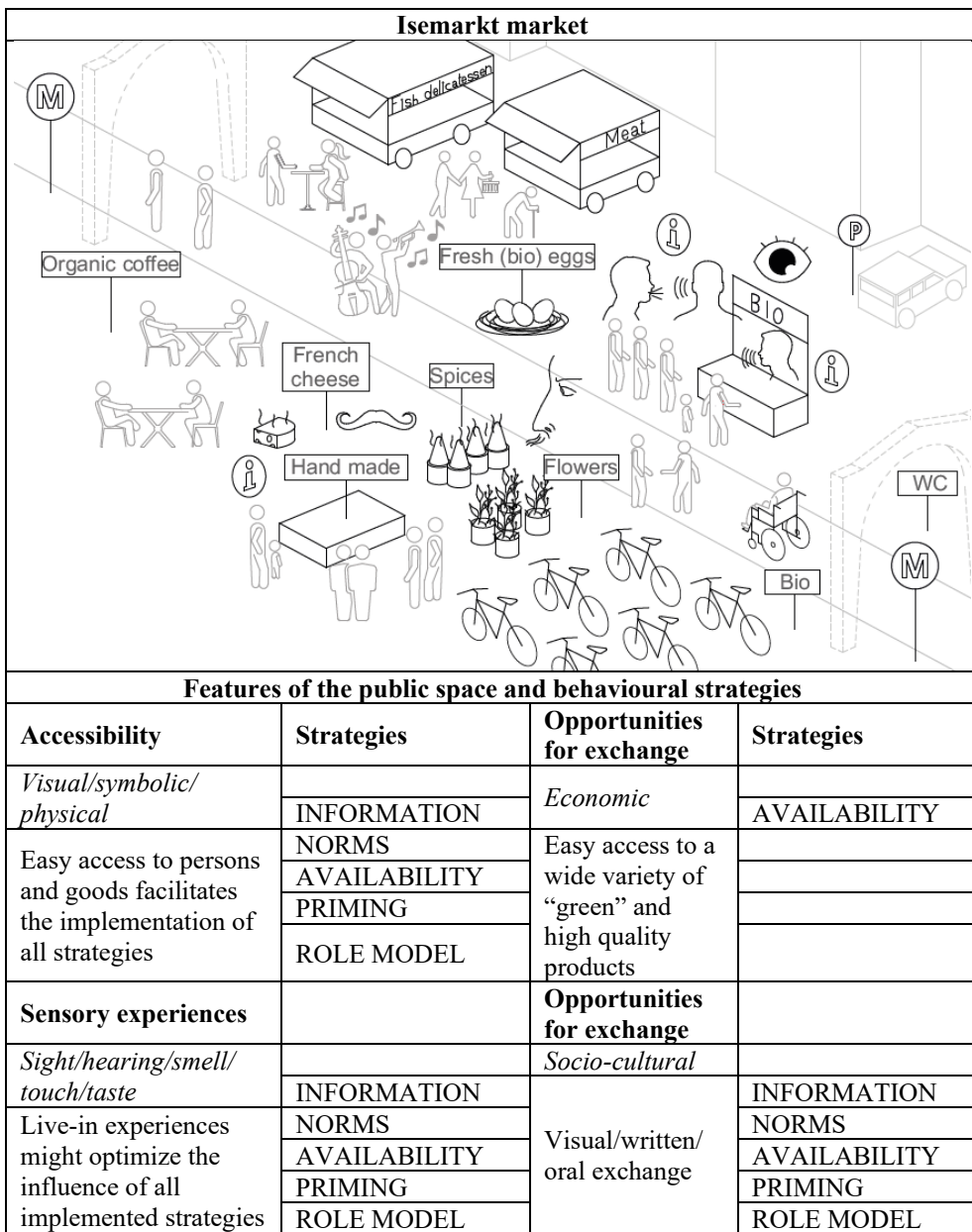


Figure 1: Public space and ongoing strategies in Isemarkt market. (Source: Drawing by D. Guzmán under the supervision of the author, 2022.)

(bio, local, own produced) and their high quality, including delicatessen and hand made products. That pleasant and charming atmosphere creates a feeling of comfort, welcome and safety for habitual clients, made up of the middle and upper class in the neighbourhood.

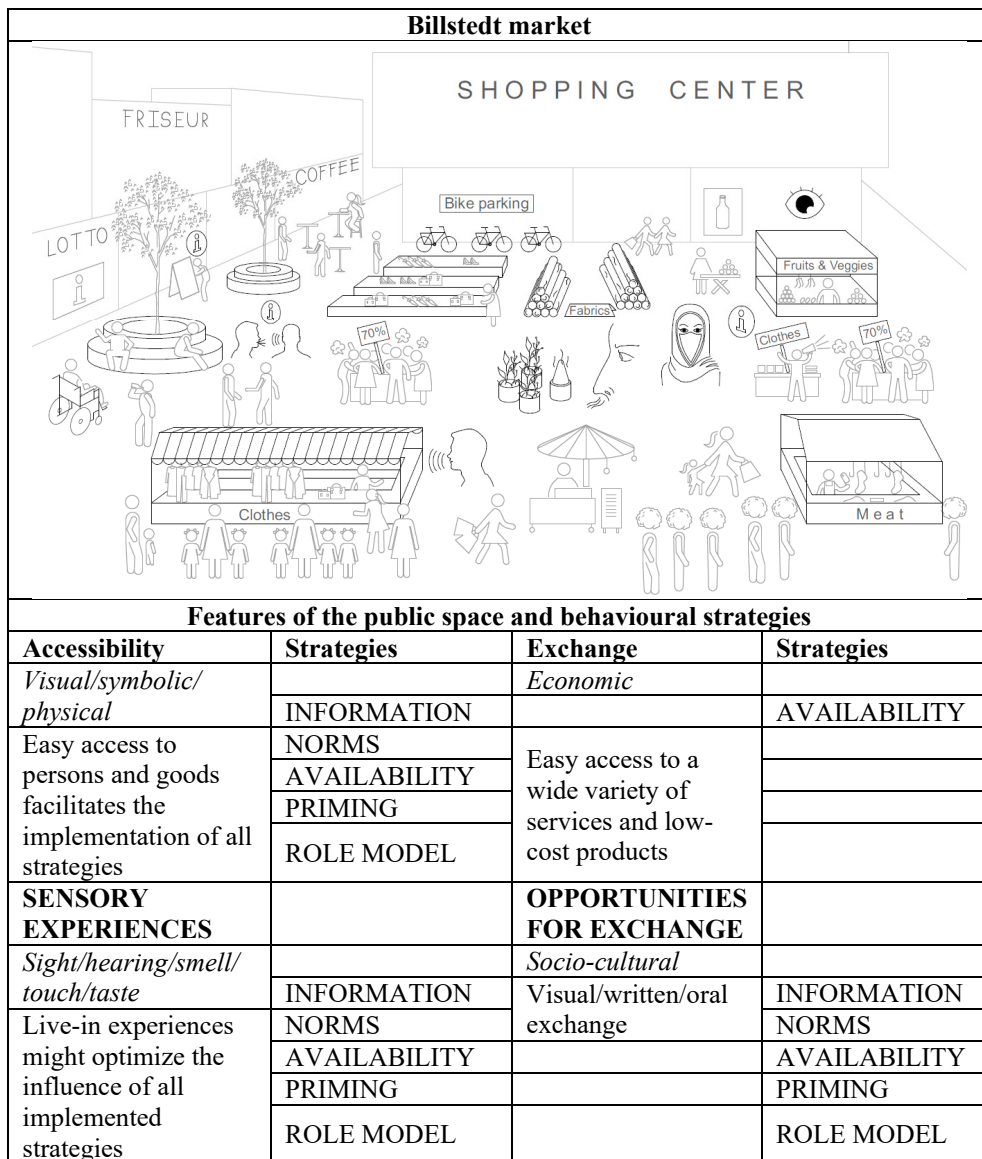


Figure 2: Public space and ongoing strategies in Billstedt market. (Source: Drawing by D. Guzmán under the supervision of the author, 2022.)



However, it sends out a symbolic message for the type of individuals that are welcome, restricting active participation to people with the ability to pay. The eye also meets the French style iron bridge – it is the subway what is running overhead here, which in addition to beauty, assures protection against weather conditions, reinforcing the feeling of comfort and protection.



In Billstedt, *animate* cues from the environment include sellers – many times members of the settled immigrant communities in the area – and a large number of people attracted by the wide range of commercial services available, including the street market, local shops, and the shopping mall. Numerous cafes and restaurants where people can take a break or meet someone surround the market while secondary sitting in the form of wall-rings for plants provides visitors, who are not necessarily consumers with the opportunity to stay. All of it together creates a very lively atmosphere that invites others to join, mainly low-income residents, but also people from the low-income surrounding neighbourhoods. In Billstedt, numerous labels, placards and signboards marketing low-price product – especially clothing and fabrics – send a welcome symbolic sign to low-income people, in striking contrast to the situation in Isemarkt. The shops marquees surrounding the market as well as the shopping mall provide shelter against the weather if necessary.

For a summary overview of the relationship between the attribute of the public space *accessibility* and ongoing behavioural strategies, see Table 1.

Table 1: Accessibility and strategies.

<b>Accessibility</b>			
<b>Isemarkt</b>		<b>Billstedt</b>	
			
<i>Physical access</i>			
-Public transport (Barrier-free subway stations, bus)	-Bike stations -Car parking	-Public transport (Barrier-free subway stations, bus)	-Bike stations -Car parking
-Smoothly surface		-Uneven surface (no problem)	
<b>All behavioural strategies: INFORMATION, NORMS, AVAILABILITY, PRIMING, ROLE MODEL</b>			
<i>Visual/symbolic access</i>			
-Sellers (producers)	-Pleasant atmosphere	-Sellers (migrants)	-Lively atmosphere
-Abundant bio, delicatessen (expensive) products	-Seats (mobile carts) -Physical shelter (bridge)	-Abundant low cost products (fabrics)	-Seats (box flowers) -Physical shelter (shops nearby)
<b>All behavioural strategies: INFORMATION, NORMS, AVAILABILITY, PRIMING, ROLE MODEL</b>			

## 5.2 Opportunities for exchange

A very rich socio-cultural and economic exchange took place in the two markets. This section focuses on socio-cultural transactions dealing with visual and oral information followed by examples of economic transactions.

### 5.2.1 Socio-cultural exchange in Isemarkt

Visual information – written: Numerous *labels* informing about prices, offers and quality certification, *signs* providing accurate information about the producer and forms of production (e.g. family owned company since 1895 dedicated to the manufacture of caps made of wool ; free-range eggs directly from the farm), location of the farm, and product ( region of origin, fruit variety). *Signboards* are providing a wide broad of information, ranging from membership in responsible farms and agricultural enterprises, including photos of good practices (e.g. chickens and pigs ranging freely) to advertising discounts on BIO products due holidays. Numerous *mobile selling carts* provide contact information as well information about products and services (e.g. Mediterranean cuisine, fish delicatessen, and homemade bread to take home and/or to eat locally). They also inform about the location of the market stand according to operation days in different locations. *Placards* provide information about the name of the market, the conditions of stay (e.g. pets, cigarettes or bikes in motion are not allowed) and opening hours. *Paper bags* are providing information on the seller and product. *Signage* provides diverse information like bicycle service or concerts.

Visual information – social norms. Here are included observations about any situation or behaviour that was notably common in the market, including specific consumer practices involving the participation of at least ten people (e.g. long queues of people and/or market stalls with many customers around). The visual assessment lead to the conclusion that environmentally friendly consumer behaviour is common as the market provides a wide variety of “green” products (e.g. free-range eggs and dairy products directly from the farm, fresh fruit, vegetables from controlled farms, regional products, products from local farmer, own harvest, self-made, vegans). All this, even if only seven of 178 market stalls hold Bio/Öko certifications, according to the information provided by the district office [22]. The market stalls “take-away” vegetarian food and “De pasta-1992”, offering self-produced flour products faced problems managing the crowd.

Visual information – priming and salience: Commonly sold products in Isemarkt include a wide range of foodstuff. Here, the eye cannot overlook the very numerous and green labels highlighting both the ecological quality of the different products (bio, regional, own produced...) and their high quality, including delicatessen and hand made products. The context influences individual behaviour through unconscious process. While the high number of labels attract people’s attention repeatedly, attractive cues from the environment (e.g. visually attractive labels; friendly chicken doll advertising fresh eggs) reinforce the effect on behaviour through sensory cues.

Visual information – role model: In Isemarkt, friendly sellers – many times original growers or producers – are proud of their products and happy to discuss about that with their clients. Talks include a wide range of issues such production process, cooking recipes or holidays. Talk about similar preferences or habits can contribute to strengthening ownership. In the same way, the individual decision when choosing or buying certain types of products or services is supported by comparable decisions made by people perceived as being similar. One might be tempted to assume that the sellers guide purchase decisions. The power of sellers shaping decisions however, is tempered by the wishes of the customers, as one of the



local producers in Isemarkt expressed in interview “Customers expect a huge variety of products so we have to import some of them, even if we don’t want to support this. Otherwise they would go to another stand with more variety of fruits and vegetables”. This example shows that the market is an articulated system in which the actors are influencing each other.

Oral information – interaction. Isemarkt provided an opportunity for interactions between different actors, including sellers, buyers, neighbours, friends, relatives, and students and workers in the area. Casual encounters between neighbours, having lunch with colleagues or meeting friends and relatives decide the frequency and duration of the interaction while the availability of toilets makes the stay easy.

Oral information – social learning and personal development. In Isemarkt, these processes occurred through observation, sensorial experiences and interaction, but also by direct learning. Direct learning occurs when a patent holder teaches potential buyers how the invented lemon squeezer works while ceramic rubs are presented and the people are gathered in a crowd by learning how to use them.

Oral information – civil participation. Three examples of civil participation were observed during the visits to the market. First, some markets stalls work with the association “foodsharing” [23], a citizens’ initiative dedicated to save and distribute surplus food that would otherwise be thrown away. Second, it was noted the presence of individuals belonging to “Oma gegen Rechts” [24], an initiative of citizens founded in protest at extreme right-wing political positions whose members are mostly women in retirement or close to legal retirement age. Third, during the face-to-face interviews with randomly selected participants, one visitor asserted, “I am here to meet the distributors for my company. We only work with Bio-stands because we are a sustainable company” suggesting the existence of networks of suppliers and customers in the market.

### 5.2.2 Socio-cultural exchange in Billstedt

Visual information – written: Numerous *labels* informing about very low prices, *signs* providing contact information (e.g. address and phone of the seller), location of the farm, and product (e.g. region of origin, fruit variety). *Signboards* are providing a wide broad of information, ranging from political campaign (e.g. name of the candidate, email, time and place of coming events) to COVID-19 regulations. A few *mobile selling carts* provide contact information as well information about products and (home and party) services (e.g. barbecue chicken two times). *Placards* provide information about the name of the market, the conditions of stay (e.g. pets, cigarettes or bikes in motion are not allowed) opening hours as well as location of facilities and services in the area. *Stickers* feature information about diverse groups and organizations. Additionally, a wide variety of signage elements enhanced the image of business and services in the area, including banners, flags, luminous letters, fibreglass figures, large format paints, posters, and pictures on the walls.

Visual information – social norms. Like in Isemarkt, here are included observations about situations or behaviours that were notably common in the market (e.g. long queues of people and/or market stalls with at least ten customers around). The visual assessment lead to the conclusion that buying cheap is a common practice as the market is flooded by signage displaying low prices. The offer of low cost fabrics is particularly broad, including curtains, carpets and everyday clothing among many other textiles. Several market stalls offering 5€ clothing as well as the “barbecue chicken” mobile cart, faced problems managing the crowd. The visibility of “green” products (bio, regional, own produced...) was notoriously poor. According to the information received from the district office, there is no information available on Bio/Öko certified products [25].



Visual information – priming and salience: Commonly sold products in Billstedt include a wide range of classical products as fruits, vegetables and household goods. Here, the eye cannot overlook the very numerous inanimate cues from the environment in form of labels, placards and signboards marketing low-price products, especially clothing and fabrics, but also trinkets and highly demanded products as medical masks. The low prices are displayed on placards of all sizes and materials. The quality of the signs varies greatly, ranging from colourful signs in vinyl, to simple carton with the price – in very big letters – written by hand. While the high number of low price labels and placards attract people’s attention repeatedly, visually attractive cues from the environment (e.g. mannequins modelling clothes) act through sensory experiences.

Visual information – role model: In Billstedt, many of the sellers belong to the migrant communities settled in the area. Members of different communities performed different actions (e.g., a group of head veiled women rummaged a pile of low cost clothes while a long line of coloured people waited for barbecue chicken), in a mutually reinforcing and supportive action. In the same way, some food shops are particularly attractive to specific ethnic groups, suggesting preserved traditions, and therefore, specific eating habits. The influence of people perceived as similar when performing action might be particularly strong when the difference between cultures is remarkable. Here, it is worth saying that different sellers reacted differently to the observers. One seller offered a fruit short after having initiated conversation while others reacted swiftly and negatively to the photos, also when taken from far away, suggesting differences in the way they interact with the territory and strangers.

Oral information – interaction. In Billstedt, sellers talking and spending time with their customers even when they should sell something, created a friendly atmosphere and suggested networks of suppliers and customers. Lively encounters also occurred among neighbours, friends, and relatives, who took advantage of numerous flower boxes for a long stay. The great variety of shops and services in the area – besides the proximity with the shopping centre – attracted a large number of people. Some are sitting in one of the numerous established restaurants in the area while others are simply observing and enjoying the excitement of the place.

Oral information – social learning and personal development. In Billstedt, social learning occurred through the observation and perception of what others do, sensorial experiences, and interaction.

Oral information – civil participation. Forms of civil participation included signboards and stickers supporting different political orientations and ideologies.

### 5.2.3 Economic exchange: Isemarkt and Billstedt

Convenience/availability. The two settings facilitated the access to a wide variety of products and services in one single place, helping to overcome external factors hindering action as effort, difficulty, or time constraints. However, there were major differences between the products and services offered by the two markets, and thus differences in consumer behaviour practices and associated environmental impacts.

In *Isemarkt*, the trading of foodstuff is the most important economic activity, among which outstanding products intended to be environmentally friendly (as mentioned earlier, only seven stalls hold Bio/Öko certifications) and delicatessen. There is also a wide range of classical products as household goods and textiles. Mobile carts offer the opportunity to eat sitting down or carryout. The food is varied, ranging from sausages and fries to vegan options, homemade, vegetarian, or Vietnamese food.



*Billstedt* also offers a wide range of classical products, including food products as fruits and vegetables or household goods. In striking contrast to the situation in Isemarkt, the offer of both environmentally friendly products and delicatessen is very limited. Rather, low-cost products abound, mainly textiles as curtains, bed sheets, rugs, carpets and everyday clothing like dresses, socks, and jackets. All of this despite the interviews indicated that one of the main reasons to visit the market is to get fresh and healthy food for the family. The location of the market in the commercial heart of that area of the city facilitates access to a wide offer of services, including numerous well-established restaurants. Consequently, the cooking offered by the market is limited to take-out food, including sausages and fries, but also offers hot sahep, a Turkish drink made from the roots of several species of orchids. Table 2 shows an overview of the products and services offered by the two markets.

Differences in consumption practices show the potential of availability-based strategies to guide individual decisions and achieve the desired outcome. For a summary overview of the relationship between the attribute of the public space *opportunities for exchange* and ongoing behavioural strategies, see Table 3.

Table 2: Availability of products and services.

Availability of products and services		
	Isemarkt	Billstedt
Classical products	Fruits, vegetables, meat, fish, dairy products, spices, household goods, flowers, textiles, jewellery, sweets, candles, items for pets, pasta, porcelain, glass cups, etc.	Fruits, vegetables, meat, fish, dairy products, spices, household goods, flowers, textiles, jewellery, sweets, items for pets, decoration, tools, toys, trinkets, etc.
Specialities/delicatessen; highlights	homemade food, delicatessen, grill specialities, rice burger, dried fruit, leather, forest fruit juice in glass, bush meat, variety of vegetables, liver loaf, handmade, organic clothing	
Bio/Öko certifications	Fruits and vegetables 3 stands; meat products 2 stands; bakery 2 stands	
International flavour (products and culinary offer)	French, Italian, Portuguese, Vietnamese	Turkish, Polish, Austrian
Services (in the market and surroundings)		Restaurants, cafes, hairdressers, mobile phone shops, banks, pharmacies, mail service, electronic products, health services, supermarkets, fabric care, tobacco, lottery, gym; Shopping centre offering multiple products and services

Table 3: Opportunities for exchange and Strategies.

<b>Opportunities for exchange</b>	
<b>Isemarkt</b>	<b>Billstedt</b>
	
<i>Socio-cultural exchange</i>	
General/accurate information about products, sellers, services, various (concerts), etc.	General/accurate information about products, sellers, services, various (political), etc.
<b>INFORMATION</b> Visual/written information	<b>INFORMATION</b> Visual/written information
Numerous people consuming expensive “green” and delicatessen products (mainly foodstuffs)	Numerous people consuming low-cost products (foodstuffs along many textile products)
<b>SOCIAL NORMS</b> Visual information	<b>SOCIAL NORMS</b> Visual information
Numerous visually attractive and well-designed labels highlighting the “green” and high quality of the products	Numerous visually and not always well-designed labels displaying low prices
<b>PRIMING AND SALIENCE</b> Visual information	<b>PRIMING AND SALIENCE</b> Visual information
Sellers (original growers) and customers with similar look and consumption practices	Sellers (look like migrants) and customers with similar look and consumption practices
<b>ROLE MODEL</b> Visual information	<b>ROLE MODEL</b> Visual information
Interactions involving sellers, customers, local neighbours, friends, relatives, students and workers in the area	Interactions involving sellers, customers, local and district neighbours, friends, relatives
Social learning and personal development through interaction, observation, live-in experiences and HOW to do it practices	Social learning and personal development through interaction, observation, and live-in experiences
Civil participation in the form of networks (suppliers, customers, civil organizations), and political demonstrations	Civil participation in the form of signage and stickers supporting different political and ideological orientations
<b>INFORMATION</b> Oral/visual information	<b>INFORMATION</b> Oral/visual information
<i>Economic exchange</i>	
Easy access to a wide variety of products, outstanding “green” and high quality products	Easy access to a wide variety of products ( wide offer of low-cost fabrics) and services
<b>AVAILABILITY</b>	<b>AVAILABILITY</b>

### 5.3 Opportunities for sensory experiences

The presence of numerous individuals who are cheerful and relaxed together with a very colourful decoration create a truly lively and festive atmosphere in the two settings. The analysis shows that all the senses are stimulated when visiting the market, creating opportunities for emotionally rich experiences through sensation and perception processes, which in turn might optimize the impact of planned interventions.

Looking at *Isemarkt* is a very rewarding experience: from visually attractive and elegantly designed market stalls to carefully selected products (e.g. bio, handmade) nicely packaged, jewellery, ceramics and flowers. The atmosphere changes throughout the year. Colourful fruits, vegetables and flowers are especially evident in summer, while Christmas decoration like candles are the focus during the winter season. Visually attractive and carefully designed mobile selling carts add to the fancy atmosphere. Here, the captured scene includes the stamp of an elegant couple of deer and boar promoting grill specialties in competition with a sexy mermaid advertising fish delicatessen.

Rhythm and music from street musicians (clarinet, accordion, contrabass and guitars together with the knife sharpener using tools to play “drums”) fill the air with joy. The aromatic experience includes sweet (flowers, crepes), stimulating (cheese, spices, coffee) and strong (fish, meat) smells, while curiosity leads a willing hand to touch an exotic fruit or participate of the tasting cheese experience.

The location of the *Billstedt* market in the commercial heartland of that part of the city leads to duplication of efforts to catch people’s attention. Different products and services are promoted via luminous letters, signboards, flags, stickers, posters and pictures, placards, information boards and signs in different sizes and colours, predominantly yellow and red. Efforts to attract the visual attention of visitors include shop windows exhibiting diverse products – like a box of vitamin supplements in big format – and fibreglass figures – like a big ear advertising hearing devices or clothes dressed on female mannequins. Colourful fruits and vegetables in combination with playful products as costumes and wigs as well as trinkets and toys contribute to create a lively and joyful atmosphere. During the visit, one seller was singing when he was selling to customers, the hand took the offered fruit to pre-test and the nose announced the proximity of the sahlep stand, enriching the sensorial experience. For a summary overview of the relationship between the attribute of the public space *opportunities for sensory experiences* and ongoing behavioural strategies, see Table 4.



### 5.4 Situational features

In *Isemarkt*, about 178 markets stands follow an about 600 m path sheltered by a bridge with a subway station at each end. The market stands run along both sides of the approximately 5 m wide road, allowing a front, left and right view. It is a pedestrian road, as two large parallel streets on both sides of the bridge are used to transport the goods. There are not evident spatial arrangements preventing social or economic activities. Indeed, many visitors shop while moving from one subway station to the other, facilitating an overview of the different activities in the place and thereby facilitating the success of planned interventions.

*Billstedt* market is based in a central square, laid out on a grid system. In the square, there are elements that could disrupt the free flow of people as structures for lighting, bike rack, trashcans, wood frames for the care of trees, and flower boxes, in addition to a uniform walking surface. Nevertheless, people in wheelchairs are regular visitors. Moreover, the



Table 4: Opportunities for sensory experiences, situational features and strategies.

Opportunities for sensory experiences and situational features	
Isemarkt	Billstedt
	
<i>Sensory experiences</i>	
-Sight: a wide range of visual stimuli (signage, colours, figures made of cardboard, etc.)	-Sight: a wide range of visual stimuli (signage, colours, figures made of fiberglass, etc.)
-Hearing: Street musicians (clarinet, accordion, contrabass, guitars) and enthusiastic sellers	-Hearing: Enthusiastic sellers
-Smell: sweet (flowers, crepe), stimulating (cheese, spices, coffee) and strong (fish, meat)	-Smell: sweet (flowers), stimulating (cheese, spices, sahle) and strong (fish, meat)
-Touch: exotic fruit	-Touch: clothes, fabrics
-Taste: cheese pre-test	-Taste: fruits pre-test
All behavioural strategies: <b>INFORMATION, NORMS, AVAILABILITY, PRIMING, ROLE MODEL</b>	
<i>Situational features</i>	
The street pattern allows a front, left and right view	The grid pattern offers many different ways to go, see and experience
All behavioural strategies: <b>INFORMATION, NORMS, AVAILABILITY, PRIMING, ROLE MODEL</b>	Behavioural strategies: path-dependent

flower boxes facilitated stay conditions, suggesting that the spatial arrangements do not constrain social and economic activities. However, a grid system enables individuals to find their way in the market, limiting the influence of potential interventions to the areas and stands visited.

For a summary overview of the relationship between *situational features* and ongoing behavioural strategies, see Table 4.

The analysis shows clear evidence that the two weekly markets studied here are places with a high number of activities involving the active participation of individuals. Furthermore, the two settings enabled the implementation of all the revised behavioural strategies, pointing out the potential of the public space to influence individual behaviour. The results are further discussed in the next section.

For a graphical overview of the ongoing behavioural strategies in the markets and related features of the public space, see Figs 1 and 2.



## 6 CONCLUSIONS AND DISCUSSION

This research explored the potential of the public space as a forum for the promotion of environmental action. For that, the study investigated the relationship between four features of the public space (accessibility, opportunities for exchange, opportunities for sensory experiences and situational features) and five strategies typically used for the promotion of environmental behaviour (information, social norms, availability, priming and salience, and role model). The first conclusion of the analysis is that under certain conditions, the public space becomes an optimal scenario for the implementation of strategies that could be used to encourage environmental behaviour. The analysis showed clear evidence that all the strategies studied are already running in the two weekly markets. These findings suggest that researchers and practitioners dealing with behavioural change should recognize the role of the public space – street markets and corresponding social dynamics in particular – as a forum for action and behavioural setting, favouring conditions to use it for the spread of environmental practices on a large scale.

Second, regarding features of the space, the analysis shows that easy access to the place in the form of free-barrier areas, public and private transport as well as friendly pavements facilitated the movement of goods and people into, out of and around the markets, pointing out the *physical accessibility* feature as a pre-condition for the implementation of all the strategies. *Visual and symbolic access* sent mixed signals about whom and what to buy through cues from the environment. Radically different social atmospheres and products (green and high quality products in a refined atmosphere vs. low-cost products in a warm but simple atmosphere) symbolically closed off access to people who feel comfortable in that particular atmosphere, like certain items and are able to pay for them. This draws attention to the importance of encouraging the visit to the site of action by creating an inclusive atmosphere for all sectors of society, particularly avoiding the association between green products and very high prices (an issue that needs to be solved in practice first). Once in the market, the individual is exposed to massive *opportunities for exchange*, which in turn facilitated the implementation of all the strategies. Sociocultural exchange included a vast amount of visual, written, and oral information in the form of signage and different forms of interaction and social behaviour, including direct learning experiences and civil participation. For its part, economic exchange included a vast number of buy and sell activities, in line with the economic nature of the street markets. The wealth of information answering whom, what, how and where questions about products and services in combination with easy and fast access to them, might facilitate action by overcoming effort, difficulty or time constraints but also influencing perceptions, motivations, attitudes, beliefs and values. *Opportunities for sensory experiences* included pleasant live-in experiences that stimulated all five senses, which in turn might reinforce the influence of the context driving action. The analysis of *situational features* dealing with the influence of spatial arrangements guiding action highlighted the importance of a physical arrangement that facilitates long stays and ensures the continuous exposure of the participant to opportunities for action. Possibilities for sitting together with toilets and weather protection facilitated long stays. It is worth saying that primary sitting was essentially restricted to restaurants, which were very popular with customers in both settings. Secondary sitting like flower boxes, stairways and sidewalks were very popular, probably because it enabled visitors to enjoy the place with or without the need to consume. Regarding exposure, the analysis shows that a street pattern that allows a front, left and right view facilitates the continued exposure of the participant to opportunities for action.

Third, all the revised strategies deal in one way or another with different types of information, including visual, written, oral, but also sensory information, leading to the



conclusion that information-based strategies play a key role promoting action, in line with previous research. The findings complement the existing literature in shedding light on visual information as the most relevant strategy influencing action in the markets, places largely associated with face-to-face communication. Visual information is linked to the very numerous printed signage. It is also closely linked to social norms-based strategies showing what other people do, priming and salience-based strategies attracting the attention of the consumer repeatedly through a wide use of signage and items, and role model-based strategies guiding and reinforcing individual decisions while observing people perceived as similar performing certain behaviour. Additionally, people have visual access to all the products offered, influencing availability-based strategies. Visual information is also a main component when creating live-in experiences.

A fourth result is a by-product of the study: the analysis reveals significant differences in the type, quality and price of products offered in the two settings. The type of products ranges from supplies needed for survival to entertainment products. Their quality ranges from bio label to unknown origin, while their cost ranges from relatively very expensive (mostly environmentally friendly products) to very low (mostly clothing and fabrics). In line with the main theoretical argumentation of this paper, this shows that the influence of the environment can pull in opposite directions. For instance, placing the sell and purchase decision between green, high quality and expensive products and low-cost, dubious quality products. All efforts should therefore focus on directing the different strategies toward the desired results.

One final observation is that in one of the settings, sellers used words as “fresh” and “supervised production” as well as the green colour to highlight the environmentally friendly quality of their products. All that, when only seven of 178 stands hold bio certifications, drawing attention to the need for a clear, fair and efficient classification system of environmentally friendly products.

Being exploratory in nature, this study focused on a limited selection of street markets, limiting the generalizability of the empirical results. Further studies might want to focus on larger samples and more standardized forms of measurement to explore further the conditions under which those places become spaces suited to the spread of sustainable behaviour. In this line, further research should examine current (none) environmental practices performed by clients and sellers as well as identify the most effective practices to be performed in accordance with the sociodemographic characteristics of the participants and spatial conditions. Furthermore, the potential of the public space reinforcing community resilience is a fruitful area for research: weekly markets provided easy and fast access to medical mask during the COVID-19 pandemic.

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