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Research article

The Composition of Saint Petersburg Scents: Smellwalks for Urban Exploration

Elizaveta Redko (✉)  and Maria Bogatyrenko 

¹ Peter the Great St.Petersburg Polytechnic University, Polytechnicheskaya, 29,
St.Petersburg, 195251, Russia

redko.ev@edu.spbstu.ru; bogatyrenko.mv@edu.spbstu.ru

Abstract

Smells are an integral part of the perception of space, but also one of the most difficult aspects to investigate. This article presents the image of St. Petersburg through his composition of smells. As a result of the analysis of the smell paths described by respondents (N=81), noting all the smells and the associations that arise long their route of movement around the city, several visual representations of the composition of smells of St. Petersburg were developed, fixing different aspects. The first method of visualization is a classic circle of smells, that will form a general idea of their composition, which directly presents the main categories (food, city, nature), each of which in turn is divided into independent elements and their sources. The second method of visualization is the correlation of the emotional assessment of smells, with their frequency of occurrence during a walk in the form of spheres of different colors and sizes. The third visualization is a generalized “route of smells,” on which possible smells and their sources are marked on a fragment of the city map from the metro station “Ploshchad Muzhestva” to the Benois Garden. The fourth type of visualization is a representation of the same urban route, but according to the individual compositions of each respondent, noting the frequency with which an individual perceives a certain smell and the set of smells that are detected. The variations in representing smells shown in the study allow us to see many different approaches to the problem of composition, which can be both a generalized scheme and a map of the area, taking into account the emotional component, as well as individual characteristics.

Keywords: Smell; Smellwork; Composition; Association; Petersburg

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Научная статья

Композиция запахов Санкт-Петербурга: Исследование города через маршруты ароматов

Елизавета Редько (✉)  и Мария Богатыренко 

Санкт-Петербургский политехнический университет Петра Великого, ул. Политехническая, д. 29,
Санкт-Петербург, 195251, Россия

redko.ev@edu.spbstu.ru; bogatyrenko.mv@edu.spbstu.ru

Аннотация

Запахи составляют важную часть восприятия пространства, однако запах – один из самых сложных для фиксации аспектов пространства. В данной статье представлен образ города Санкт-Петербурга через композицию запахов. В результате анализа описаний маршрутов с фиксацией запахов и ассоциаций респондентов (N=81), было разработано несколько визуализаций композиции запахов Санкт-Петербурга, отражающих разные аспекты. Первый способ визуализации представляет собой классический круг запахов для формирования общего представления о композиции запахов, в котором представлены непосредственно основные категории (еда, город, природа, специфические запахи), каждая из которых в свою очередь подразделяется на самостоятельные запахи и их источники. Второй способ визуализации представляет собой соотнесение эмоциональной оценки запахов с их частотой появления в ходе прогулки в форме сфер разного цвета и размера. Третья визуализация – это обобщенный “маршрут запахов”, на котором отмечены возможные запахи и их источники, на фрагменте городской карты от станции метро “Площадь Мужества” до сада Бенуа. Четвертый тип визуализации – это представление о том же городском маршруте, но уже в виде индивидуальных композиций каждого респондента, где видна как частота упоминания отдельных запахов, так и специфичность совокупности запахов для отдельного человека. Представленные в исследовании варианты репрезентации запахов позволяют увидеть разнообразие возможных подходов к проблеме композиции, которая может представлять собой как обобщенную схему, так и карту местности, учитывать эмоциональную составляющую, а также индивидуальные особенности.

Ключевые слова: Запах; Карта запахов; Композиция; Ассоциация; Петербург

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INTRODUCTION

We tend to associate the dimension of remembrance with that of imagery. When we think of a place or an event, we recollect a more or less distinct picture of it. And yet, it is not only the visual organ that dominates in memory. Smells play a major role in a human's life because they make it possible to form the memory of an object or phenomenon, without the figurative component of the picture. The olfactory sense has direct access to parts of the brain that remained mostly unchanged in recent evolution, governing the regulation of hormones, emotions and memory (Palukhova et al., 2017). Furthermore, smell is a crucial component of space perception. When we see, feel and hear the city, we inhale its aromas. The whole composition of smells in the air can be called the *smell landscape* and is a very strong influence in the perception of an individual's urban environment. Although the concept of *smellscape* was proposed by Porteous as an analogue of the *soundscape* in 1985 (Song, & Wu, 2022), sensory urbanism has become popular only since the 2000s, and contemporary researchers have delved into the practical study of the smells of cities, mapping, and studying the influence of smells on various aspects of urban life (Allen, 2021; Gao et al., 2022; He et al., 2022; Song & Wu, 2022; Xiao et al., 2021).

The image of the city is formed in the composition of all distinctive smells and aromas of his landscape. Every city can not only be seen, heard, and touched, but also smelled. St. Petersburg is filled with the spicy aromas of confectioneries and sharp odors from the factories, the sweet fragrance of flowers in front gardens and the seaweed smell from the port district. The smell forms a holistic perception of an object, and, in this composition, it conveys his uniqueness.

However, smell is one of the most difficult aspects of space to convey out of individual experience, as opposed to the auditory and visual components, that are nowadays easy to recorder within a technical high-fidelity support. The problem lies not only in repeatability and the lack of “smell-recording equipment,” but also in the fact that the vocabulary of words describing smells is poor and imprecise.

The purpose of this research is to present the composition of smells across St. Petersburg by analyzing the variations of itineraries and smells that occur along the way and what associations they evoke in the participants.

LITERATURE REVIEW

Smells may be spatially ordered or place-related. Individual cities, even urban types, may be distinguished by smell (Porteous, 1985). Smells play an important role in rhythm analysis, as indicators and markers for other urban rhythms (McLean, 2020). The role of smell in our city experience is deeply connected with the specific focus on personal links formed among smell, location, and emotion (McLean, 2014). In the book *The Foul and the Fragrant: Odor and the French Social Imagination*, Alain Corbin (1986) talks about how the concept of *bel air*, compared with today's meaning, meant something very different in the 1750. It was identified as a source of contagious and incurable diseases



such as pestilence. The “stench of the city” was considered a major threat to the health of all inhabitants, regardless of their social class or fortune. We see the city, we hear the city, but above all: we smell the city (Henshaw, 2013).

In addition, many authors who have researched this topic notice that each person perceives smells differently. Therefore, some smells that are barely perceived by someone will have a profound meaning for someone else (Porteous, 1985). Although all persons are likely to judge an unfamiliar smell as unpleasant, the same smell may be familiar and pleasant to one individual but unfamiliar and unpleasant to another person (Porteous, 1985). That is because already known smells are unconsciously processed by people, while only unfamiliar or strong smells are brought to people’s attention (Quercia, 2021). Most Russians would not recognize the scents of bubble gum, cheddar cheese, clove, coconut, dill pickle, fruit punch, gingerbread, licorice, lime, mint, peanuts, pizza, pumpkin pie, root beer, and wintergreen (Doty et al., 1996). The association of smells with a place linked to one’s past experiences offer an intimacy between the individual and the place, which creates place attachment (Xiao et al., 2018). The smell has an advantage over other senses, because it is directly linked to the limbic system in the brain and immediately stimulates an emotional response (Paluchová, et al., 2017). The composition of the perceived *smellscape* has a huge impact on human behavior, attitudes and health. Further studies have proposed a systematic exploration of various odors in urban green environments and offered novel insights into the design of *smellscape*, by unveiling spatial-temporal odor distribution patterns (He et al, 2022). In urban and architectural studies, *smellscape* research takes qualitative approaches to consider the social and psychological impacts of diverse smells from *in situ* experiences or recalled memories. Methods such as *smellwalks*, interviews, observations and the scale rating of perceptual factors (i.e., like/dislike, familiar-unfamiliar) are commonly employed to collect data on people’s experiences and subjective evaluations of the olfactory environment in real contexts (Xiao, et al., 2021). Some of the results included visualizations, to indicate multi-scalar scent-temporalities of a city, polyrhythmic relationships between the situated human body and a range of smells, and a series of projective mappings that rendered visible olfactory-sensed information. All those instruments serve to examine relationships between smells and space, smells and time, and smells and people (McLean, 2020).

Many of those scholars mention that often the perception of odors depends on a person’s past experience and memories. Many of the smells that a person encounters in everyday life, in most cases, are associated with childhood. Smells can be memory releasers for the reconstruction of one’s childhood (Porteous, 1985). Smell is also a great emotional trigger, so it may enhance the overall experience of places. Because the olfactory interpretation can be different from individual to individual, sharing different people’s sensations has the potential to make understandable the olfactory experiences of the place. The olfactory identities of places are not smell inventories in themselves, but ways in which these smells are met and interpreted in these specific places and types of places (Balez, 2021). *Smellwalks* require a “reorientation” of the senses to temporarily emphasize the information received from the nose. During a walk, the researcher employs an active form of smelling to examine their environment and what of it is divergent from usual smell perception (Allen, 2021). In the book *Noises, Smells and Colours*, John F.



Runciman (1915) says that people in different cultures employ olfactory constructs to help make sense of the world and their place within it. Cities worldwide are linked through individual experiences rekindled through smell memories (McLean, 2014). An individual citizen's odor perception may consist of exposure to one or more odorants (McGinley et al., 2000). The reaction of pleasure or aversion to a smell is more closely related to the relationship between the individual and the circumstances or environment than with any other sense. The ability to relate past to present perception – smell memory – and the gradations of odor impact are discussed, as well as the engaging effects of fragrances on behavior, odors and sexuality, mother-infant bonding, and pollution (Engen, 1991). A particular smell makes us unknowingly re-enter a space completely forgotten by the retinal memory; the nostrils awaken a forgotten perception, and we are enticed to enter a vivid daydream. The nose makes the eyes remember (Pallasmaa, 2005). Smell and long-term memory are closely related and, more importantly, smell associations are retained for much longer time periods than visual images (Quercia, 2021). Smell, more than any other sense, can trigger nostalgia (Henshaw et al., 2016).

Some authors have worked in the direction of tracing the uniqueness of a city by studying his smells. Smells play an important role in rhythm analysis, as indicators and markers for other urban rhythms (McLean, 2021). It has unique qualities: ubiquity, persistence, and an unparalleled connection to memory, yet it has gone overlooked in discussions of sensory design (Henshaw, 2013). Studies on olfactory apprehension of places are currently too few, but they nonetheless show the importance of this sense in forming the peculiarity of a place (Balez, 2021). In this way, colors, sounds and smells are important sensorial components of places that give them unique characteristics (Ranazanova & Vaz de Freitas, 2021). Smells contribute to a place's own identity (Quercia, 2021).

In Vienna, during 2011, the philosopher Madalina Diaconuran directed a project exploring the meanings and associations of the tactile and olfactory qualities of the city (Diaconu, 2011). The sense of smell is highlighted as a sociocultural construction that establishes social identity, objectifying them, and by doing so it reproduces social differences (Paluchová, et al., 2017). In the book *Urban Smellscapes* British researcher Victoria Henshaw conducted a study based on *smellwalks* on the streets and the relevant points of Doncaster (England), ended by drawing a smell map of the city (Henshaw, 2013). Other researchers focused on the data analysis of smells via social media platforms on the Internet (Quercia et al., 2021). A team of German scholars led by Rossano Schifanella has conducted a *smell landscape* research through online posts in London, Barcelona, and New York, while McLean (2021) has connected the traced sources of smell with the visual representation of Kiev. Chinese researchers presented a *smell map* of the central urban area of Guangzhou (China) (Gao et al., 2022). According to Gao, the smell of a space is inseparable from the sustainable development of the living environment. The research on olfactory perception and smell landscape has a positive effect on landscape design and urban planning and contributes to the formation and design optimization of unique urban memory.



METHODOLOGY OF THE SURVEY

The study used a methodology known as *smellwalks*. *Smellwalks* are a method which require a reorientation of the senses to temporarily emphasize the information received from the nose (Allen, 2021). The research was conducted among students of Peter the Great St. Petersburg Polytechnic University, inquiring what smells they feel while traveling around St. Petersburg. Eighty-one people were interviewed, among which 57 (70.4%) were males and 24 (29.6%) females. The age of the respondents is 17-19 years old. All respondents agreed to the use and publication of their answers for scientific purposes. The surveyed had to describe their itinerary through St. Petersburg, pointing “the places and smells of the city” that accompanied them and the associations that emerged when perceiving a particular fragrance. To this description, made in a free form, was necessary to attach a map of movement. Due to the specificity of the subject of research, which does not allow a strict fixation, different approaches to the visualization of smells, which enabled the composition of smells of the city to be revealed, were used in the work.

CATEGORIES OF SMELLS

In analyzing the results of the survey, one can trace the most pervasive smells in St. Petersburg and figure out what associations and thoughts they evoke. The information that was obtained from the respondents enables the sources of the smells to be divided into 3 major categories. These categories include the smells of food, the smells of the city and the smells of nature (Figure 1).

Food

The smells from fast-food restaurants are often associated with a quick and delicious meal, friendly service and the atmosphere of warmth and comfort. The participants of the survey are “very fond of the aroma of food-courts that increases appetite” and the smell of fries which “drives them crazy.”

The majority of respondents claims that *the smell of pastry* evokes associations with a new day, tenderness, coziness and family circle. This smell induces pleasant emotions since it’s soothing and relaxing. Although many people like the smell of pastry, some of them admit that it “makes them to move faster” because “tasty smells cause their stomach to rumble.”

The smell of chocolate is synonymous with childhood and winter nights. This smell improves the respondents’ mood because it brings back memories of “New Year sweet gifts brought by their parents.”

The smells of vegetables and berries are associated with vigor and freshness which are generally connected with warm seasons. “This bouquet of aromas gives to understand that summer has genuinely arrived” and “brings back some memories of gardening with parents in the countryside.”

The smell of popcorn evokes associations with cinemas, huge queues and “a unique smell of seats which accompanies every film show.”



Figure 1. Categories of smells

The smell of coffee is associated with the dawn of a new day and creates a pleasant sense of warmth. The participants of the survey point out that the smell of coffee beans brought them a small but required dose of happiness. They say that this aroma invigorated in the morning and gave them confidence. The respondents also note that the smell of coffee reminded them of “the school morning routine, the love for a girl and a date with her, and the atmosphere of warmth and coziness.”

The smell of shawarma (a popular Middle Eastern dish) and “fresh roasted meat” meets people when they are leaving the metro. This smell is associated with student life and youth.

The smell of fish seems to be unpleasant to the majority of respondents. This smell “is rather disgusting” and strong. It “causes burning in the nose” and it is associated with something filthy and fetid.

The smell of alcohol is mostly associated with revelries, upcoming holidays and with several famous streets, because “in addition to the historical cultural component, St. Petersburg is also a city of rebellious subcultures and parties. Only in St. Petersburg you will find special streets with nightclubs, restaurants and bars for every taste. They are called Rubinstein Street and Dumskaya Street. Consequently, it can be understood that the smell of alcoholic beverages is a crucial component of the “smell map of St. Petersburg.”



Nature

For some people *the smell of freshness* causes nostalgia for childhood and promotes feeling of relaxation. The others have a charge of vivacity for the whole day due to this smell (“Nature smelled fresh, the sun came out;” “After leaving home, I felt a cold smell of freshness;” “During the May period, grass always smells fresh in Esenin Park. The steam is quite thick, so I have time to enjoy the freshness, feel vivacity and a burst of energy”).

Freshly cut grass is associated with a summer cottage, a native home, pleasant freshness, and for most people the smell of grass is connected with joy and peace (“The wind brings the smell of growing grass nearby. This smell makes your head spin, freshness hits your nose, and you are filled with strength for the coming day;” “Walking in the park, I noticed that the lawns were recently mowed and the smell there was very pleasant, it was the smell of freshly mown grass”).

The smell of trees is associated with the freedom of childhood, the ease of a summer spent with a grandmother in the countryside. The smell of trees embodies pleasure and relaxation (“I can feel the smell of trees in the park. This pleasant aroma evokes memories of the countryside where I’ve spent a lot of time with my grandmother;” “The scent of flowering trees is a real smell of spring. This smell is very pleasant and improves my mood immediately”).

The smell of flowers reminds people of spring, life, happiness, and strolls (“And here is the smell I was looking for – the smell of flowers, very delicate and fragrant. The smell of flowers in wildlife is especially pleasant, it’s always pleasing to the eye and nose;” “On the way to Grazhdansky Avenue there is a flower shop which smell fascinates me very much. It’s incredibly hard not to love the smell of flowers”).

The majority of respondents associates *the smell of dampness* with something attractive (“The subway smells damp because it was raining last night. This smell does not cause me any distinctive negative emotions, I like it;” “Pleasant smell of dampness from the fountain, grass and trees has already begun to prevail in the shade near the first building;” “I was approaching the house when it started to rain. I was going to walk faster in order not to freeze, but the smell of wet asphalt made me stand still and enjoy the atmosphere”).

The smell of rain evokes a pleasurable feeling of freshness (“It has rained recently and now you can feel the smell of rain on the street. You can feel freshness inhaling this smell;” “Rain makes me feel positive emotions, there is a feeling of new life”).

The smell of greenery is associated with a nice walk with a grandmother, pleasure, and freshness (“I’m passing through an alley where various trees, bushes and flowers grow in flowerbeds and I can feel a pleasant and fresh smell of greenery;” “Walking through the Kolpinsky city park, I enjoyed the smell of young trees, flowers and fresh greenery”).

The smell of the Neva River is associated with a sea breeze, a desire to go to the river in the countryside, and fishing. (“A strong spring wind blows from the Neva and water smells fresh. I like this smell combined with the coolness of the wind;” “Only on the Liteyny Bridge I have felt the breeze and the smell of the Neva again and this smell



was very similar to the smell of the sea;” “The smell of water and freshness began to be felt more clearly on the approach to the cruiser Aurora”).

City

The smell of exhausted car fumes often provokes disgust and the desire to hide from it as quickly as possible. However, many people got so used to this odor that sometimes it reminds them of their childhood. The smell of gases is a part of the urban environment.

The smell of cigarettes is also very common on the streets of the city. Many people find this smell unpleasant and disgusting, but among the respondents there were some people who get positive emotions from the smell of tobacco: “I light up, my friends also smoke nearby. The smell of tobacco always makes me feel warm in the spring. There is no need to hurry anywhere at the time of a smoke break, you can drop all the burdens and worries for a moment.”

The smell of dust is a “routine” for the citizens, few people dislike it because of its habituality.

The smell of engine oil, surprisingly, is pleasant to many participants of the survey. It evokes nostalgia for childhood (“childhood memories of helping in the garage,” “I wanted to become a driver,” “since childhood I have been fond of various kinds of equipment”).

Various smells of buildings (plaster, paint, concrete) are associated with renovation (“recollections of the process of building the house with my parents”).

There is a wide variety of *smells in the metro*: “tar soap,” “the smell of creosote from soaked sleepers... for many people it may seem harsh and unnatural, but this smell is pleasant to me, because it resembles numerous railway journeys,” “a mixture of smells of old stone and clothes of numerous people.” This raises many associations, for example, childhood trips, peace and tranquility, lightness of mind and the beginning or end of the day.

The smell of sewage, of course, causes only disgust for everyone. (“My favorite Griboedov Canal: berths, boats, yachts, bridges. Ugh! Why does it always stink like sewage here?”).

The smell of asphalt, particularly wet, is associated with freshness and cleanliness (“I do not know people who would not like the freshness of the air after rain. When you breathe this fresh air, it feels like you have extra moral and physical strength”).

The smell of petrol as well as the smell of engine oil brings back memories of childhood (“The gas station is one of the few places where petrol smells as pleasant as in childhood,” “memories of my father's work”).

The smell of sweat reminds people of dirt. It is also associated with sports.

The smell of litter is associated with staleness and ordinariness.

The smell of rubber reminds people of the underground and trips (“I walked in a small courtyard. There are smells of warm car tires, rubber, as if some of the cars had just stopped to rest after a long trip”). It is pleasant enough, but the smell of burnt rubber is disgusting (“There is a tire shop right behind the bridge. I can feel the smells of burnt old rubber and a variety of lubricants which are not the most pleasant smells for me”).



The smell of wood is associated with the countryside and childhood memories. It evokes warm emotions of a distant past.

The diagram below (Figure 2) highlights unpleasant, neutral and pleasant odors of St. Petersburg in terms of perception. The smells of cigarettes, dust, exhaust gases, metro and petrol are the most unpleasant (“but more than anything the smell of exhaust gases from cars perhaps is felt. Unfortunately, this is what the reality of life in a major city is. The city gives you a lot of opportunities, but sometimes brings a lot of harm;” “on the opposite bank of the canal I felt unpleasant smell of cigarettes;” “dust and exhaust gases created an unbearably disgusting mixture of smells;” “the smell of the St. Petersburg metro is the smell of oiled machines and engine oil”). The category of neutral smells consists in that of water, dampness, humidity, fruits, vegetables, and *shawarma*. According to the diagram, pleasant smells are the aromas of coffee, trees and flowers, rain, freshness (“out on Zvenigorodskaya Street it was impossible not to smell blooming trees and flowers in the flowerbeds. Even the grass heated by the morning sun smells in a triple size which caused my head to spin. Nevertheless, I had easily overcome this sweet dizziness and went on;” “almost reaching Ploshchad’ Muzhestva, I smelled flowers from a small stall near the road. It was very pleasant to be near the stall because of the smell of flowers which made other smells almost imperceptible;” “after leaving the house, I smelled cold freshness, and felt a surge of vivacity and energy for the whole day”), coffee (“the smell of coffee beans brings me a small but required dose of happiness in the morning, invigorates in the afternoon and gives phantom confidence in every undertaking”), and the smell of perfume which refers to specific scents (“you can catch completely different perfume aromas due to the fact that public transport is crowded. There are sweet and tart women's perfumes and brutal men's perfumes;” “the smell of perfume coming from a passing girl brought me to the Earth. I felt the flavors of rose and chocolate. I have never seen such a combination in perfume, and I really enjoyed it”). The diagram illustrates the frequency of occurrence of each scent. The size of the circle depends on the prevalence of a particular smell. The most common are the smells of metro, exhaust fumes, dust, cigarettes, pastry, and coffee. The smells of paint, deodorant, popcorn, and chocolate are mentioned less frequently. Every circle in the diagram has its own specific color which shows a particular category of smells (food, city, nature) it belongs to. Green circles (trees, water, grass, and rain) refer to the *Nature* category, blue circles (dust, sweat, cigarettes, exhaust gases and the subway) refer to the *City* category, and orange circles (coffee, pastries, fast food, vegetables, fruits) refer to the *Food* category. The purple circles represent the category of “specific odors” which includes the smell of human suffering, sickness, drunkenness, sweat; the cozy smell of the room; the smell of palm paraffin candles and the smell of the sun.

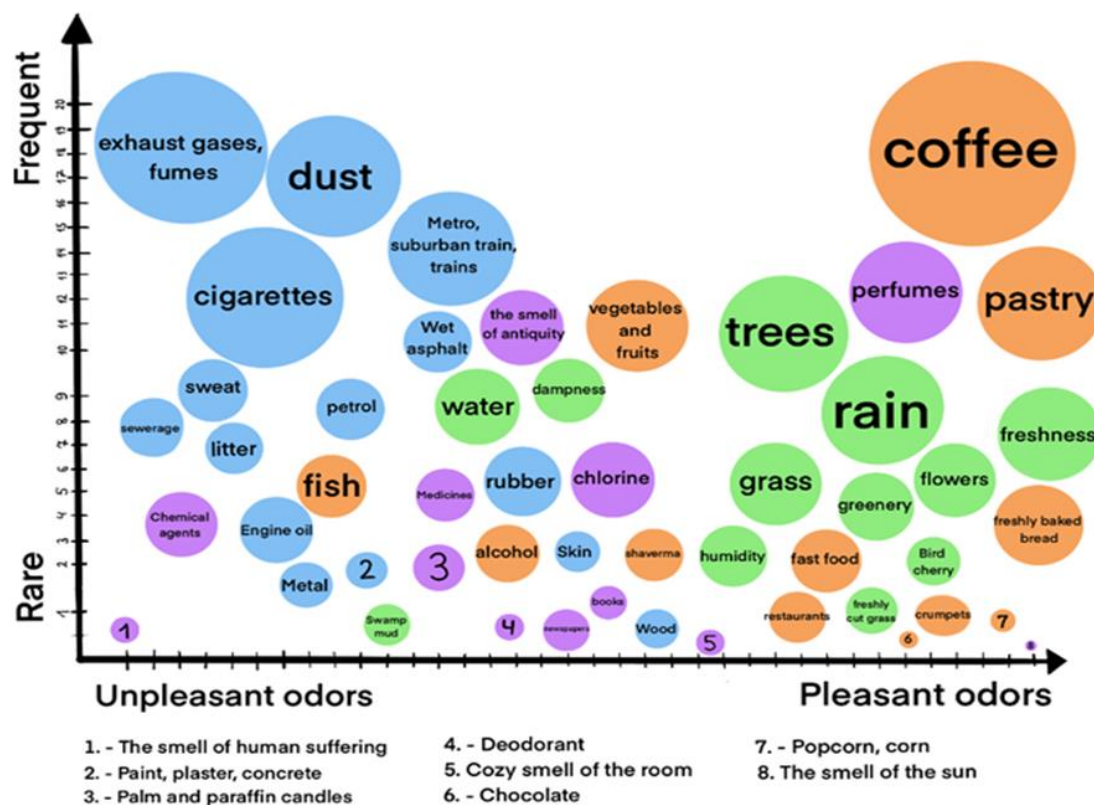


Figure 2. Pleasant, unpleasant, and neutral odors and their frequency

Thus, we can see that urban smells are most often perceived as unpleasant, although there are exceptions (“I like the smell of the metro since my childhood, that is why I wanted to become a machinist when I was a child;” “the road on the waterfront is being repaired, it smells of dust. I like such mechanical smells because I am fond of machinery and often face with them;” “there is a crowd of students at the entrance. They are smoke electronic cigarettes and the air around them is saturated with artificial flavors of strawberries, coconut and mint. I like to pass by them and although I feel that these smells are factory-like, they seem to be attractive for me”), and the smells of nature mostly are predominantly delightful, at least almost not annoying. Even the smell of rain which is one of the characteristic features of St. Petersburg is perceived positively (“I do not know if there are people who do not like the freshness of the air after the rain. When you inhale this fresh air, it feels like you have extra moral and physical strength”; “the rain starts and brings new freshness and I simultaneously feel the mood of change. When such weather begins, all other smells seem to recede and give an advantage to the smell of rainwater and dampness”). The smell of food is also located between the neutral and positive spectrum of odors. It is also worth mentioning that the smell of coffee is both very popular and greatly appreciated.



THE SMELL ROUTE OF ST. PETERSBURG

The city of St. Petersburg is full of various smells. Therefore, it can be assumed that the image of the city is ambiguous, and its flavors emphasize this inconsistency. Smells form associations, and the image of a city in a person's mind is built from associations. After analyzing the data, we compiled one route of the smells, that we present as summarized data on a map (Figure 3). The journey starts from the Ploshchad' Muzhestva metro station and ends with the Benoit Garden (which, being in close proximity to the university campus, is quite popular among students).



Figure 3. The smell route of St. Petersburg

The itinerary starts from the metro station Ploshchad' Muzhestva, from Polytechnic Street. Here respondents described “the smell of creosote from rail trains,” “the smell of hot dust, iron and tunnel dampness,” as well as “a mixture of smells of old stone, clothes of numerous people and perfumes.” According to the majority, this smell is “sharp and unnatural,” but at the same time “it resembles numerous railway trips and adventures, children's trips.” The perfume aroma is pleasant for many people in the palette of scents



of the metro: “it is pleasant, floral and reminds me of my mother's perfume.” Since public transport is crowded, the respondents distinguish different perfumes: “there are sweet, tart women's perfumes, and brutal men's.”

Near the metro station, on 17 Politechnicheskaya Street, the aroma of coffee and fresh bakery is immediately felt. Going further towards Nepokorennnykh Avenue, half of the respondents noted the aroma of fast and delicious food, which is associated with warmth and affability. Further down the street Polytechnic 17, the smell of vegetables and fruits emanating from market stalls can be traced. According to the description of the surveyed, this smell is associated with freshness, cheerfulness and a warm season, “this bouquet of smells makes it clear that summer has really come,” “mentally returns consciousness to the dacha, where we brought in the harvest on the kitchen-garden with parents, pleasant memories arise.”

In the direction of the Polytechnic metro station, the smell of trees (maples, birches, oaks) prevails, associated with freedom, ease and summer. There is a smell of flowering trees in the park. This smell brings back memories of the village where many people “spent a lot of time with grandmother.” There is a feeling of freshness and a charge of vivacity: “nature smelled fresh, the sun was out.” During the May period, the park always smells of grass, “the park is quite wide, so people have time to enjoy the freshness, cheerfulness and a burst of energy.” According to the description of the respondents, the park is quiet enough, calm, and atmospheric, “the world of nature, especially in autumn, simply fascinates with its beauty and splendor.”

The metro station “Polytechnic” is one of the key places on the route, it is a source of different smells. There is often a “pungent smell of electronic cigarettes and strawberry gum.” Most have complex associations: on the one hand, the smell of gum is associated with school years, and on the other cigarette smoke repels and irritates. The smell of tobacco prevails along the Polytechnic Street. Then it is replaced by the smell of daisies and orchids from the window of a flower shop. People associate floral scents with the warm season, most often with spring.

On the other side of the street smells of fresh bread and apple pies. As the survey data showed, this smell reminds respondents of the house where grandma once “baked charlotte in the oven according to an old recipe.”

There is a smell of wet asphalt near the road, it seems pleasant to most of the respondents: “the smell is very pleasant, breathing it, you feel fresh;” “a feeling of new life immediately appears.” The trees smell damp, the smell is associated with “freshness and new breath,” Along Tikhoretsky Avenue smells of “freshly brought bananas and frozen fish” at the store. This smell is not repugnant to most of the respondents, but for some it causes “rejection and a desire to move on as soon as possible.”

From the building located on Tikhoretsky Prospekt, 7 k1, the aromas of freshly made coffee and pastries come again. Most of these smells are associated with awakening, comfort, and also cause pleasant emotions, soothe and relax. Further along Tikhoretsky Avenue, the smell of dust and car tires is felt. As you know, these are not the most pleasant aromas, but many city dwellers no longer pay attention to them, considering it “commonplace.” It is worth noting that the smell of cars is associated with travel: “I



turned into a small courtyard, there smells of warm car tires, rubber, as if some of the cars had just stopped to rest after a long trip.”

Along the way, there are several more grocery stores with the smells of vegetables, fruits and other food. At the intersection of Tikhoretsky Avenue and Nauki Avenue, there is a pleasant aroma of new printed publications, various magazines and newspapers. This smell evokes warm emotions for many, is associated with cozy evenings spent reading your favorite book. On the other side of the street, you can smell exhaust gases, gasoline and asphalt. These scents often cause disgust and a desire to hide from their sources as quickly as possible, but for some these are already familiar smells that suggest nostalgia for childhood, “memories of my father's work”: “the gas station is one of the few places where gasoline still smells as pleasant as in childhood.” These smells are part of the urban environment. The final point of the route is the Benoit Garden. Here you can feel various scents of nature: foliage, flowers, trees, pond. The smells encountered on the way have a calming effect. According to many respondents, the smell of trees “lifts the mood and fills us with romantic feelings.”

The route we have laid out concentrates a lot of smells. Starting from the square of Courage, the flavors smoothly replace each other, which makes our subconscious work. Associations and memories are built up in our head right up to childhood. However, this composition consists of smells, the combination of which is quite difficult to imagine. Fresh bread, sweet pastries and the aroma of hot coffee contrast with the smell of fish near the subway, exhaust fumes and pollen. Cigarette smoke irritates many, arising the wish to escape from this smell. An opposite example is the fruit shop, that one likes to stay nearby, because his smell reminds of summer and the carefree times spent in the town. The range of associations is quite wide. The aromas of rain and flowering trees are associated with freshness, positive emotions: “very pleasant, inhaling it, you feel fresh;” “a feeling of new life immediately appears,” and the smell of cars is associated with travel: “I turned into a small courtyard, there smells of warm car tires, rubber, like some kind of the car has just stopped to rest after a long trip.”

As soon as someone walk along this route, imagination will begin to generate a lot of images. This is a great opportunity to walk not only through the sights of the city, but also through the corners of consciousness.

The diagram Figure 4 reflects the composition of smells which was encountered on the same path by particular individuals. The colors of rectangles presented in the diagram demonstrate their belonging to one of the groups of smells (*Food, Nature, City* and others), and the length of the rectangles represents the frequency of the occurrence of listed scents. It can be seen that the majority of respondents considers various scents of nature (flowers, trees, grass), the smell of cigarettes, the subway and baking as the most wide-spread, and the smells of alcohol, asphalt and popcorn as the rarest. This diagram clearly shows the variability of the combinations of smells which depends on a person's perception capacity and individual preferences. The horizontal segments in each column of the diagram reflects the number of respondents who encounter a particular smell on their way. Each such strip has its own specific color that refers to a person (for example, green – 1st respondent, orange – 2nd respondent, blue – 3rd respondent and so on). Nevertheless, there may be objective reasons related to changes in the sources of smells



over time, but in this case subjective factors play the biggest role. Moreover, one of the most important factors is the life experience of a person. One can pay attention to the smell because it seems familiar and evokes certain associations, the arrival of the blooming season, a different beginning, and joyful events.



Figure 4. Individual compositions of smells

We also noticed that some smells are found in almost all the respondents' answers, such as coffee, flowers, fresh bread, rain, perfume, and the subway. But there are also rare smells: deodorant, popcorn, alcohol, and fish. This may be due to the specifics of the city's infrastructure, because certain sources of smell may be more than others. For example, there are a lot of coffee shops and restaurants in St. Petersburg, but there are much fewer fish shops. Smells can vary in intensity and “coverage area.” It is also possible that the majority of respondents just wanted to remember more pleasant smells, while they do not want to focus on the smells that they find repellent or were associated with negative memories.

CONCLUSIONS

St. Petersburg is a concentration of an incredible amount of smells, which can be divided into basic categories. This richness is reflected in the possibilities of combination. This city is revealed in completely different ways for every person. Smells from various categories will be encountered throughout the itinerary and evoke opposite emotions and associations. For each person, this city reveals itself in completely different ways. Along any possible route there will be smells from different categories that will provoke opposite emotions and associations, therefore, a complex and multifaceted image of St. Petersburg will be formed.



Based on the information obtained during the study and presented in the diagrams, we came to the following conclusions:

- All the smells obtained during the survey can be divided into several categories: *Food, Nature, City* are the three more characteristic and wide. A fourth, special category includes all the smells that “stand apart,” not belonging to any of the other, but playing a key role in shaping the portrait of St. Petersburg, including rare smells and details that create the atmosphere of the entire composition as a whole;
- The same smell often forms different associations among respondents, mainly due to the difference in previous experience and the unique perception of every single person (for example: the smell of alcohol may be associated with “adverse events in life and with disorder,” and may be associated with “rest after a hard day, with stress relief and a pleasant evening”);
- The regularity in the frequency of odors encountered has been established. So we see that the most frequent smells indicated among the respondents are: fresh pastries, coffee, dust, food, perfume, and subway. On the opposite side of the spectrum, the rarest smells are that of deodorant, popcorn, and fish. As it was noted earlier, such a quantitative difference arose as a result of the specific infrastructure of the city, because some sources are more frequent than others;
- The *smell route*, compiled on the basis of the conducted research, consists of important and main sources of some smells that will provoke various, even opposite associations and emotions, that will help, in turn, in forming a more holistic and multifaceted image of St. Petersburg for each person.

The variants of the representation of odors presented in the study allow us to see a variety of possible approaches to the problem of composition, which can be both a generalized scheme and a map of the area, taking into account the emotional component, as well as individual characteristics.

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СВЕДЕНИЯ ОБ АВТОРАХ / THE AUTHORS

Мария Владимировна Богатыренко,
bogatyrenko.mv@edu.spbstu.ru
ORCID: 0000-0001-8558-6247

Maria Bogatyrenko,
bogatyrenko.mv@edu.spbstu.ru
ORCID: 0000-0001-8558-6247

Елизавета Владиславовна Редько,
redko.ev@edu.spbstu.ru
ORCID: 0000-0002-7454-4620

Elizaveta Redko,
redko.ev@edu.spbstu.ru
ORCID: 0000-0002-7454-4620

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