Cartography M.Sc.

Master thesis

Reclaiming Place Through Marginalized Narratives

A Critical Geography and Humanistic Approach to the Cartographic Visualization of Beyoğlu, Istanbul

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TECHNISCHE UNIVERSITÄT DRESDEN

ITC UNIVERSITY OF TWENTE.

2021

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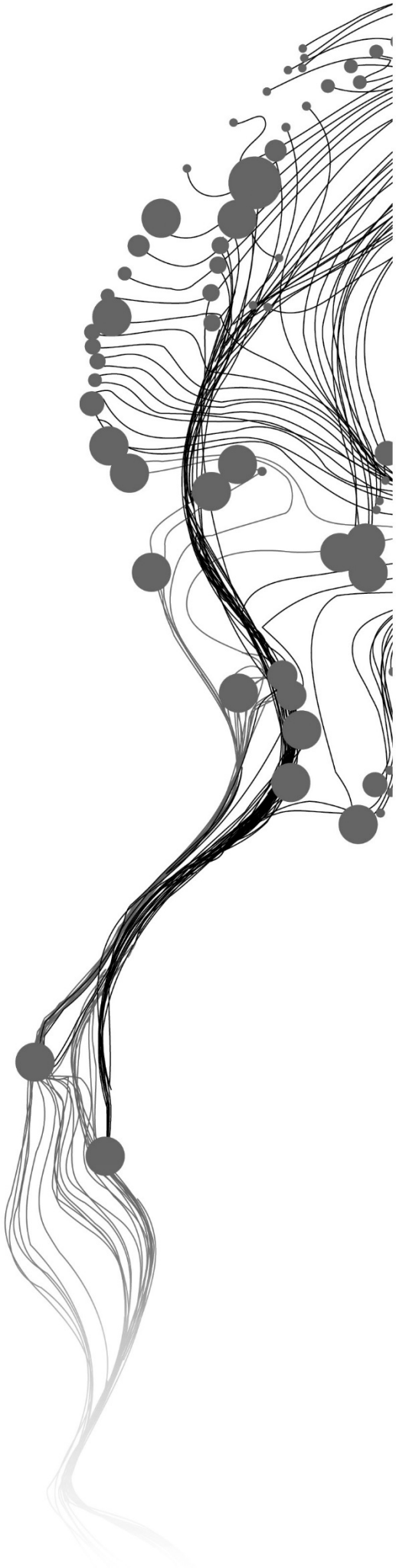

Reclaiming Place Through Marginalized Narratives: A Critical Geography and Humanistic Approach to the Cartographic Visualization of Beyoğlu, Istanbul

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Enschede, The Netherlands, October, 2021

Thesis submitted to the Faculty of Geo-Information Science and Earth Observation of the University of Twente in partial fulfilment of the requirements for the joint Master of Science in Cartography.

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ABSTRACT

This study attempted to develop, document, and evaluate cartographic visualization techniques that are driven by feminist visualization principles in the context of Beyoğlu - *I Will Survive* map, a counter-mapping project that deals with issues of gentrification and urban development. These visualization techniques were intended to fulfil different goals of the project, such as conveying a collective sense of place, raising awareness of the challenges the neighborhood faces, and encouraging map users to take action. The data used for the project consisted of memories and posed unique cartographic challenges as they were text-based and rich in information. Conventional and unconventional visualization techniques were proposed to address these challenges and an evaluation was undertaken to assess what was gained and lost when these techniques were used. The evaluation took the form of an online questionnaire and was answered by 103 respondents. Results showed that although the unconventional visualization techniques were more difficult for the map users to understand, they could still be more effective than the conventional ones in fulfilling the aims of the feminist visualization principles. Based on the findings, further recommendations and considerations were identified for counter-mapping practices and cartography at large.

Keywords: Counter-mapping, critical cartography, feminist cartography, Beyoğlu, Istanbul, visualization

ACKNOWLEDGEMENTS

I am grateful for the opportunity these past two years to grow as a person and a scholar. I am thankful for many people that were there for me during this process. For that, I would like to acknowledge a few.

Franz-Benjamin – for providing me with constructive feedback, always being there to answer my questions, and pushing me in the right direction at times when I felt lost.

Barış İne from the Center for Spatial Justice – for your collaboration, enthusiasm, and time.

Juliane – for navigating the ever so tumultuous past two years with us and always being attentive to our well-being and needs.

Mariam – for being a fantastic student representative and a wonderful friend; for all the laughter and joy and love and support and struggles that we have shared.

Roan – for being a partner, an advisor, a friend, an editor, a co-worker, a comedian, and a personal assistant all at the same time.

The 8th intake – for sharing their knowledge and allowing us to build on it.

The 9th and also known as the nice intake – for ongoing support and solidarity.

Beyoncé Knowles – for your music that kept me going.

Ece Kutsal – for your words that kept me sane.

I would not have been able to do it without all of you.

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1. INTRODUCTION

1.1. Motivation and Problem Statement

It is increasingly acknowledged that maps are instruments of power and gain meaning recursively as they are produced and consumed in different contexts (Kitchin & Dodge, 2007). This realization has led to the practice of counter-mapping, which is an appropriation of the map as a tool to subvert the status quo and elevate marginalized narratives, which refers to the perspectives that are underrepresented, or not represented at all, in official maps. The term counter-map was coined in the context of local and international efforts to oppose the state's land claims that undermined "local people's territorial forest rights" in Indonesia (Peluso, 1995, p. 393). Today, counter-mapping is widely used among non-governmental organizations, activists, and community groups to stand against oppressive power structures, whether that may be neoliberal urban development projects or disproportionate representation of men in the street names (kollektiv orangotango+, 2018).

Within counter-maps, there exists an increasing need to collectively visualize a sense of place through mapping experiences, however, the existing conventional cartographic visualization techniques that serve this need have their limitations. For example, contemporary online counter-mapping projects, such as Queering the Map and Narratives of Displacement and Resistance, are both collaborative mapping platforms that use point markers and pop-ups to convey a collective sense of place (Anti-Eviction Mapping Project, n.d.; *Queering The Map*, n.d.). As a result, the sense of place is communicated solely through the additional media within the pop-ups, rather than the cartographic visualization techniques (Mocnik & Fairbairn, 2018). While the use of point markers and pop-ups is well-founded within the bounds of GIS technologies and have the advantage of being familiar, they are inadequate when it comes to representing places. Experiences and memories regarding places are often expressed as text and are rich in information. However, they rarely provide precise and logically consistent spatial data suitable for being processed by existing GIS technologies.

Beyoğlu - *I will survive* map is a counter-map example that aims to reclaim Beyoğlu —a neighborhood in Istanbul, Turkey— by highlighting memories and places that reflect the neighborhood's character. Recent urban development projects have led to an increasing loss and transformation of small businesses and public spaces in Beyoğlu. In an attempt to raise awareness about this loss and create resistance, the Center for Spatial Justice (Mekanda Adalet Derneği in Turkish, also known as MAD) have asked the neighborhood's aficionados which memory places, whether existing or lost, give Beyoğlu its character and the experiences, feelings, and thoughts they associate with those memory places. These memory places were mapped in 2018 where each memory place was represented with a point symbol and selected memories were added onto the map using call-outs (Figure 1.1). In its existing depiction, Beyoğlu - *I will survive* map relies on traditional methods to visualize point data and the associated text. There remains an opportunity to explore this data with unconventional and alternative visualization techniques that are tailored for this project.

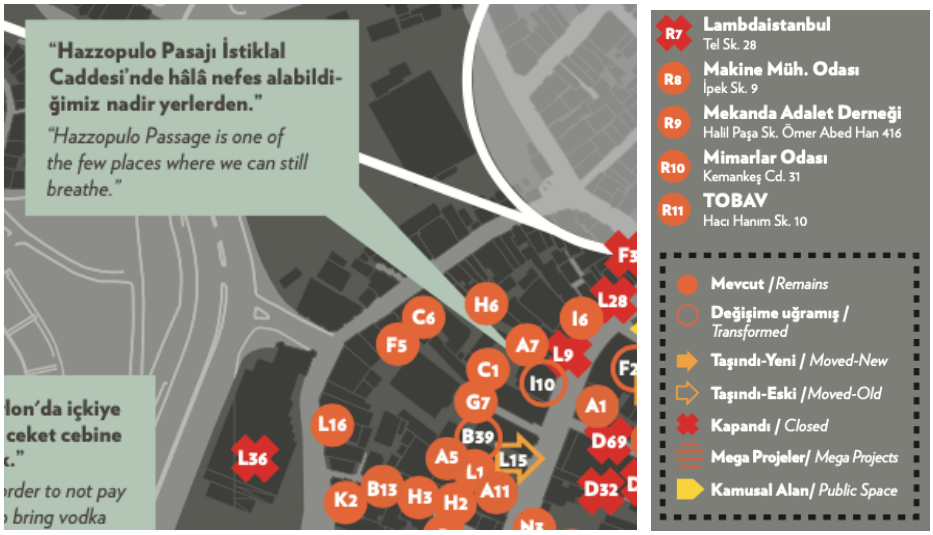

Figure 1.1 Conventional techniques (left) and legend (right) as seen in Beyoğlu - *I will survive* map (beyond.istanbul, 2018)

Researchers who have previously dealt with mapping place-based experiences developed unconventional techniques and documented their processes (Kelly, 2019; Knowles et al., 2015). Kelly has used interviews with Syrian refugees as a starting point and developed feminist visualization techniques to more accurately convey border crossing experiences (2019). Knowles et al. have explored beyond the limitations of GIS and developed a humanistic approach to visualize Holocaust survivor testimonies (2015). As these visualization techniques are uniquely fitted to the content, they cannot be directly applied to other maps, but their processes can be used as an inspiration. The final results of both research projects are unique and attention-grabbing maps; however, little research has been done on how these maps are perceived by the users.

At the junction of increasing interest in place-based counter-mapping practises and ongoing research on unconventional visualization techniques, this thesis is an investigative attempt to visualize a collective sense of place in the case of Beyoğlu - *I will survive* counter-map. It reimagines Beyoğlu - *I will survive* map with visualization techniques that are driven by feminist principles and the content of the memories submitted to the project. In an evaluation, it offers an account of how these unconventional visualization techniques fare against their conventional counterparts from the users' perspective.

1.2. Research Objectives and Questions

The overarching objective of this research is to adapt and document a workflow on how to create a critical and content-driven visualization of marginalized narratives, as well as to assess the effectiveness of the unconventional visualization techniques that come out of this process. Since the methods adapted will be specific to the example of Beyoğlu, this research will not offer a one-size-fits-all solution to the challenge of visualizing a collective sense of place. However, the insights from the process can be valuable to counter-mapping practitioners as well as geospatial humanities researchers who work with similar data structures such as oral histories and interviews.

For a better planning of the research process, the research objectives (**ROs**) are broken into smaller pieces as shown on the following page:

RO1: Raising a better understanding of counter-maps and the visualization techniques they employ.

RO2: Applying and developing content-driven place-based visualization techniques rooted in feminist visualization principles for the Beyoğlu – *I will survive* map and documenting this process.

RO3: Presenting limitations and possibilities of unconventional and content-driven visualization techniques in the case of Beyoğlu – *I will survive* map, for counter-mapping in general, and beyond.

In order to accomplish the above-described research objectives the following research questions (**RQs**) will be answered.

RQ1. What kind of counter-maps exist?
In order to raise a better understanding of counter-maps; it is vital to get acquainted with a diverse and extensive set of existing counter-maps. Using a published collection of counter-maps, this question will provide a glance into who are making counter-maps (RQ1.1), why they are making them (RQ1.2), and what is being mapped (RQ1.3). Beyoğlu – *I will survive* map will also be considered as a separate case.

> **RQ1.1** Who are counter-maps created by and who are they created for?
> **RQ1.2** What kind of purposes do counter-maps have?
> **RQ1.3** What kind of data do counter-maps use? Where does this data come from and why was it collected?
> **Case Question:** Where does Beyoğlu – *I will survive* map fit in?

RQ2. What are the needs, challenges, and innovations of counter-maps in terms of visualization techniques?
Before applying and developing visualizations for the case of Beyoğlu – *I will survive* map, this question will help understand visualization choices made for counter-maps and the reasoning behind these choices. Answering these questions will not only provide an account of existing strategies, but also help set the priorities for the Beyoğlu – *I will survive* map by considering it as a separate case.

> **RQ2.1** How are counter-maps designed? What technologies and tools are used?
> **RQ2.2** Which visualization techniques are widely used in counter-maps? Why are these techniques preferred over others?
> **RQ2.3** How do visualization techniques used in these maps compare to conventional cartographic visualization techniques?
> **Case Question:** What are the specific needs of Beyoğlu – *I will survive* map that conventional techniques fail to meet?

RQ3. What would the Beyoğlu – *I will survive* map look like with content-driven visualization techniques rooted in the feminist visualization principles?
This question will guide the visualization development process by outlining selected visualization techniques and feminist principles these techniques aim to fulfil (RQ3.1–RQ3.3). The selection of the principles and the techniques will be further explained in later chapters. Purposes that are outlined during the development of the visualizations will also be used during the user studies to evaluate the effectiveness of the proposed visualization techniques (RQ3.4).

RQ3.1 To what extent can distortions and the open-world assumption convey the relative importance of places and help embrace pluralism?
RQ3.2 To what extent can direct integration of text and keywords as non-geographic labels help elevate emotion and affect?
RQ3.3 To what extent can sketch maps challenge power and aspire to empowerment?
RQ3.4 Do these identified unconventional visualization techniques serve for the above-mentioned purposes?

RQ4. What insights can be generated from the process of developing and evaluating content-driven visualizations for Beyoğlu – *I will survive* map case study for the wider context of counter-mapping and beyond?
Finally, this question will present the limitations and possibilities of the visualization techniques used for Beyoğlu – *I will survive* map and discuss what these findings mean at different scales; ranging from the singular case of Beyoğlu – *I will survive* map and extending to counter-mapping and cartography in general.

1.3. Contributions

At a theoretical level, this thesis contributes to the body of literature on counter-mapping practices and needs by systemically studying and cataloging a diverse compilation of counter-maps. At a practical level, this thesis can contribute to the cartographic discipline by "advancing the field of artistic and experimental cartographies and producing new forms of knowledge on mapping, space and place theory…as well as new cartographic expressions"(International Cartographic Association, n.d.). In an attempt to develop and apply content-driven visualization techniques, this thesis aims to bridge the theoretical discussions on feminist visualization principles with cartographic practices that can be used to elevate marginalized voices. Additionally, visualizations that are developed within this thesis can be appropriated and adapted by mapping practices that have a common interest with the Beyoğlu – *I will survive* map. Further, the evaluation of these visualizations provide insights into how the use of more conventional or unconventional techniques impacts the user experience. Findings from this evaluation can be extrapolated to cartographic practises beyond counter-mapping.

1.4. Thesis Structure

In this section, I have identified my research objectives and questions in the context of the motivation statement. To answer the previously identified research questions this thesis will take the following structure.

In section 2, I provide a literature review of the related work. This work is thematically organized by narratives (section 2.1), place (section 2.2), counter-mapping (section 2.3), and feminist mapmaking (section 2.4). Within this section, I contextualize my research with the previously identified literature (section 2.5)

In section 3, I introduce the data collection methods used to collect primary data on counter-mapping (section 3.1) and present the results (section 3.2). I then introduce the data collection methods used for Beyoğlu - *I Will Survive* project (section 3.3) and classify the project's needs and characteristics as a counter-map (section 3.4).
In section 4, I describe the visualization development process for the re-imagined Beyoğlu - *I Will Survive* maps. This section is organized by visualization techniques developed under each sub-question RQ3.1–RQ3.1.

In section 5, I elaborate on the user study development for evaluation of the visualizations. This section comprises of how the questionnaire was created and disseminated (section 5.1), what it included (section 5.2), and how it was evaluated (section 5.3).

In section 6, I present the results from the user studies. After the summary of the characteristics of the respondents who took the questionnaire (section 6.1), the organization of this section mirrors that of the visualizations introduced in section 4 and presents the results for each pair of maps (section 6.1–section 6.2).

In section 7, I discuss the found results in the context of this research and the broader literature. In this section, I also identify the limitations of this research.

Finally, in section 8, I present my conclusion and identify future research possibilities.

The table below illustrates how each research question is answered within these sections (Table 1.1).

Table 1.1 Thesis organization based on sections and research questions

Introduction	Section 1
RQ1 RQ1.1–RQ1.4	Section 2 Section 3
RQ2 RQ2.1–RQ2.4	
RQ3 RQ3.1 RQ3.2 RQ3.3	Section 4
RQ3.4	Section 5 Section 6
RQ4	
Conclusion & Outlook	Section 7

2. RELEVANT WORK

2.1. Maps and Narratives

In recent years, telling stories with maps has been popular in both practice and research. Many platforms, such as ArcGIS story maps, offer editable templates to tell stories with maps to those with little to no cartography experience. For the more experienced cartographers and map enthusiasts, there exists an abundance of tools and technologies, such as Mapbox GL JavaScript libraries, that allow for more intentional crafting and curating of a story map. As storytelling through maps has become a more common practice, research foci that investigate the relationship between maps and storytelling have also become more widespread.

One research avenue is concerned with how maps tell stories. A recent study of the relationship between cartographic design and storytelling investigates whether 'spatial narratives', 'story maps', and 'visual storytelling' are mere buzzwords, and if not, what they can tell us about cartography and design (Roth, 2020). Roth argues that visual storytelling creates opportunities for hybridization in cartography, implying that there are new possibilities to join quantitative and analytical approaches with qualitative and critical approaches developed from critical cartography, indigenous mapping, and participatory GIS (Roth, 2020).

Another research avenue is about how *well* maps tell stories. Stories are often expressed as text and are rich in information. However, they rarely provide precise and logically consistent spatial data that is typically mapped with GIS technologies. Mocnik and Fairbairn (2018) compare the structural aspects of narrative texts and maps. Based on this comparison, they propose a storytelling approach that adapts characteristics of text in order to better convey a story. These characteristics can include, but are not limited to, flexible scales, the inclusion of non-spatial information, and an open-world assumption (Mocnik & Fairbairn, 2018).

2.2. Maps and Place

The sense of place is an important factor to consider in the mapping of stories or narratives. Our ability to map a story is dependent on the story having a spatial component, but what happens when this spatial component does not come with coordinates? The sense of place is constituted through social relations including, but not limited to, one's own experiences of a space (Tuan, 1977). Cartographers have researched how maps can be used to better convey a sense of place and there are a multitude of approaches and arguments.

The Holocaust Geographies Collective has been heavily involved with the challenge of mapping places. For over a decade, the research group has been using mapping and geography as tools to create new knowledge on the history of the Holocaust. In so doing, they have contributed to critical discussions on GIS's capability of conveying a sense of place and the development of new cartographic methods. Several examples from this collective are further elaborated on because they work with the kind of data that share characteristics with the Beyoğlu project; both projects work with text-based data with inconsistent properties. Furthermore, the processes, considerations, and reflections of the Collective's visualization methods are well documented.

Reflecting on their experience of mapping Budapest Ghettos and the spatiotemporal pattern of arrests in Italy, Giordano and Cole argue that "GIS of space" favors the voice of the perpetrator while suppressing that of the victim (Giordano & Cole, 2018, p. 665). It is important to not misconstrue this statement as GIS being intrinsically oppressive; but rather a critique of GIS's inability to center the victim's experiences when relying on tabulated data (Giordano & Cole, 2018, p. 670). The researchers contend that GIS of place can be more than a layer of narratives superimposed on a spatial grid (as text, video, or other media). They suggest corpus linguistics as a method whereby a large body of text is parsed to identify places such as "neighborhood", "corridor", "home" and the social relations between these places (Giordano & Cole, 2018, p. 670). While this type of approach to a large body of text has the advantage of retrieving information about places that otherwise go amiss, how this might look like on a map, or what kind of tools and technologies can facilitate this process remain as open questions.

Another approach for visualizing a sense of place that was originally expressed as text is inductive visualization, which is defined as "a creative, experimental exploration of the structure, content, and meaning of source material" (Knowles et al., 2015, p. 244). This approach calls for stepping away from software to return to simpler tools such as pen, paper, and markers. While closely reading holocaust survivors' testimonies, Knowles et al. became more aware of different ways in which place, time, and scale are expressed in memory and ways in which GIS is limited to reflect these complicated relationships. More than a theoretical peregrination, inductive visualization methods have been used by the authors both in cartographic practice and as a pedagogical tool (Knowles et al., 2015). Further, they have been instrumental in the development of a topology-based approach (Westerveld & Knowles, 2020) .

The topology-based approach developed by Westerveld and Knowles preserves known geographic locations that are indispensable to Holocaust survivors' stories and makes it possible to represent the relevant importance of places and relations that connect them (Westerveld & Knowles, 2020). After placing the largest places with a known location in their accurate coordinates, they place other important places based on the topological relations they have (see Figure 2.1). The final map titled "I was there" was selected as a finalist for the 5th volume of NACIS Atlas of Design, which is a prestigious and highly selective atlas for state-of-the-art map design (The Atlas of Design, 2020). Due to the final map's experimental and uncommon appearance, a skeptic could question whether the final map is a map at all. I would argue that it is, enriching the map's capabilities by prioritizing place over space and creating opportunities for representing complex and ambiguous information about places.

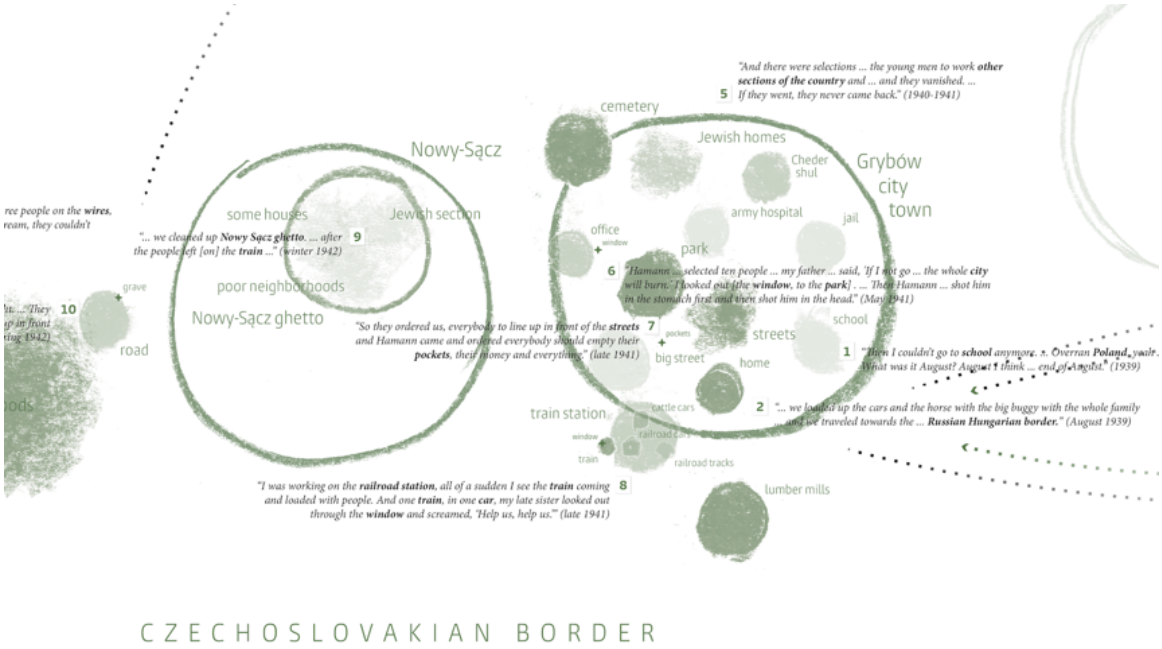

Figure 2.1 Example of unconventional, topology-based approach developed by (Westerveld & Knowles, 2018)

While the research produced under The Holocaust Geographies Collective has argued for the development of alternative frameworks, others have also pushed for an expansion of existing cartographic language to convey a sense of place (Hermann & Pearce, 2010; Pearce, 2008). Pearce argues that "If novelists can express the meaning of place through symbols only—letters on a page—then so, too, we should be able to express place through cartographic symbols only, using the same device of narrativity" (Pearce, 2008, p. 20). Pearce plays with voice, framing, focalization, and scale in order to create a narrative that is rich in information about places (see Figure 2.2). In her final map, the place is not an additional layer that can be removed, but it becomes a part of the map. This approach is further developed by incorporating type as a design element and adding text as a non-spatial label with flexible formatting that matches the meaning of the text (Hermann & Pearce, 2010).

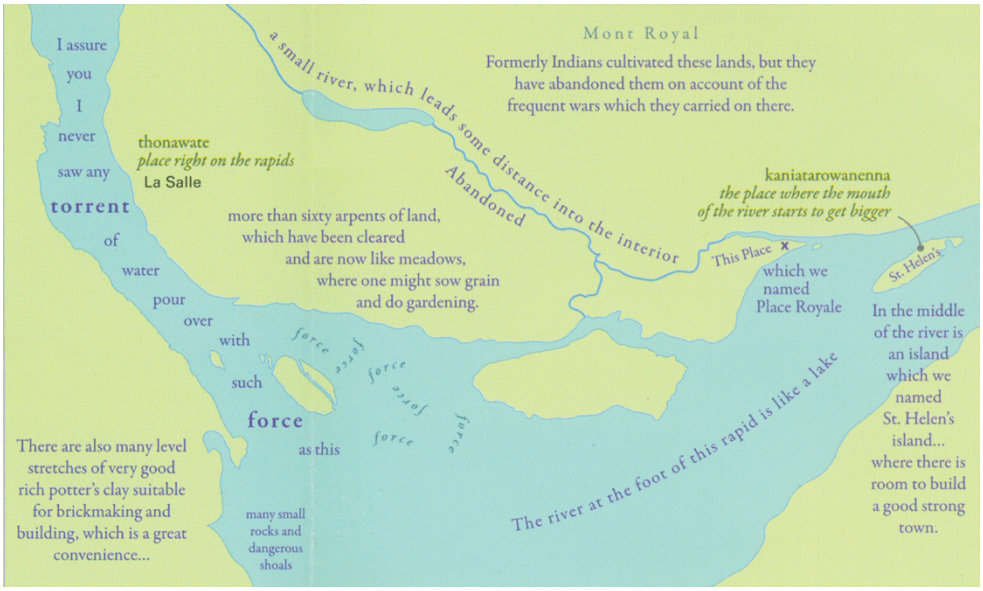

Figure 2.2 Use of text as non-spatial labels as seen in the map "They Would Not Take Me There; People, Places and Stories from Champlain's Travels in Canada, 1603–1616." (Hermann & Pearce, 2010, p. 45)

In addition to using existing cartographic grammar or developing new ones, another proposed approach is to draw inspiration from more artistic endeavors to communicate a sense of place. It is observed that "until science claimed cartography, mapmaking and landscape painting were kindred activities, often performed by the same hand" (Rees, 1980, p. 60). Kent describes the current aesthetic of "unauthoredness" of topographic mapping as homogenizing and devoid of a sense of place, and it is movements like counter-mapping that are leading the re-engagement of cartography with more traditional arts (Kent, 2012). In a personal project, a researcher mimics famous artists' and art movements' styles to a map of the United States with the intention of highlighting the connection between art and cartography (Wallace, 2011). Although his maps are rather simple, they are creative explorations that invite the readers to experiment and make their own maps, regardless of their level of expertise. Though there is much more to be said about the history of art and cartography (see also Bogucka, 2019; Ribeiro & Caquard, 2018), in the next section I will focus on artistic movements that were precursors and early examples of counter-mapping and the critical discourse that led to the theoretical conceptualization of counter-mapping.

2.3. Counter-Maps and Counter-Mapping

The origin of the term counter-map can be traced to the local and international efforts to oppose the state's land claims that undermined "local people's territorial forest rights" in Indonesia (Peluso, 1995, p. 393). Although the term was first defined in the late 90s, examples of counter mapping existed even before then. Some earlier examples can be found in artistic movements, such as Surrealism and Situationist International maps in early and mid-20th century (Wood, 2010). For example, The Surrealist Map of the World visually challenges the widely accepted representation of borders, nations, and physical phenomena such as the equator. In so doing, it counters more typical and so-called objective depictions of the world by bringing "perpetually shifting border disputes and land grabs" into question (Morris & Voyce, 2015). Another example from the arts is the Situationist International's maps such as the Naked City. The maps were produced through the process of drifting (also known as derives) in which the

mapmakers took walks in Paris and "allowed themselves to be drawn into the city by the city and discover unities of ambiance" (Wood, 2010, p. 172) In doing so, the situationists created a highly subjective yet telling depiction of the city. Not only did these maps counter official maps by their DIY aesthetic, but they also countered what was considered to be data (Wood, 2010).

While the examples from the artistic movements used maps as a tool to creatively critique the status-quo at the time, there are also counter-mapping examples born out of dissatisfaction with existing maps and are produced by communities and activist groups to present an alternative reality. Indigenous groups have historically been demanded to bring maps, that abide by cartographic notions of what constitutes a map, in order to make any sort of land-(re)claims (Wood, 2010, p. 140). In many cases the oral histories, songs, and traditions that could have acted as evidence for the claims of indigenous people were often not recognized to the extent maps were (Wood, 2010, p. 142). The necessity to provide maps that aid land negotiations have led to creation of projects such as the Nunavut Atlas (Riewe, 1992). The maps in the Nunavut Atlas, as well as other indigenous maps used in courts, were required to have the appearance and characteristics of formal maps.

Parish Map Project is another community-driven example that was borne out of a dissatisfaction; in this case it was "the threat of slow strangulation through the combined vested interests of commercial profit and political ambition which has no concern for our culture and way of life" (Wood, 2010, p. 145) Unlike the indigenous maps, these maps were not concerned with adopting characteristics of formal maps. This project was more concerned with conveying a sense of place and used established artistic traditions to challenge the rampant commercialization affecting their locality ("Parish Maps," n.d.).

As demonstrated with the examples above, an ongoing discussion is the relationship between maps and their claim to authority. Maps, or rather the processes of mapping, are increasingly considered to be "fleeting, contingent, relational and context-dependent, emerging through transductive processes to solve relational problems" (Kitchin & Dodge, 2007, p. 343). This shift in perspective calls for understanding mapping as a tool to solve diverse, context-dependent problems, rather than viewing the map as a singular, universal solution to a range of questions (Kitchin & Dodge, 2007). This conceptualization of mapping is particularly suitable for the counter-mapping practices as they come out of diverse contexts and therefore necessitate innovation. As such, there is no strict rulebook for what a counter-map as an artifact or how counter-mapping processes should look like. Despite the lack of rules and principles that guide counter-mapping, the maps produced are nonetheless legitimate cartographic solutions to a shared sense of dissatisfaction whether it is about an existing map or an existing state of affairs.

2.4. Feminist Cartography

The relationship between cartography and feminism is manifold. When thinking of feminist mapmaking; one can think of the role and place of women in the cartographic discipline (+ *Other Cartographies*, n.d.; Women in GIS, n.d.), mapping gender-based injustices that are disproportionately harmful to women (Pirani et al., 2020; Suárez Val et al., 2019), and also mapmaking practices that are driven by feminist principles (D'Ignazio & Klein, 2020b; Kelly, 2019; Kwan, 2002, 2007). The latter is the most relevant for this research because highlighting marginalized voices is not inherently a gendered issue, but it is closely linked to and can greatly benefit from critical and feminist thought.

Over time, GIS has received many criticisms for its "inadequate representation of space and subjectivity, its positivist epistemology, its instrumental rationality, its technique-driven and data-led methods, and its role as surveillance or military technology deployed by state" (Kwan, 2002, p. 645). Kwan identifies feminist geography as an appropriate lens to understand and address some of these concerns because of the following ideas (Kwan, 2002). For instance, feminist research deems any claim to objectivity as unattainable because all knowledge comes from individuals who hold distinct positions in distinct contexts, which inevitably shapes how knowledge is produced (Haraway, 1988). Furthermore, feminist geography is committed to "progressive social change that reduces social inequality and oppression of marginalized groups in general and gender inequality in particular" (Kwan, 2002, p. 646).

With these ideas in mind, Kwan argues that GIS is not inherently incompatible with critical practices in the context of feminist knowledge production; there can be alternative practices that are grounded on the critical agency of the GIS users and researchers (Kwan, 2002). Methods and initiatives for more critical GIS practices can include using qualitative data to construct cartographic narratives, providing different levels of geographical and temporal context when visualizing topics, supporting activism through GIS-based research for increased legitimacy, and practicing reflexivity by being attentive to one's positionality and the impact it has on the maps and the related knowledge produced (Kwan, 2002).

In addition to reflexivity, embodied and situated knowledges, and power dynamics, in later discussions, affect (in this context loosely used to describe emotion and feeling) is also identified as a necessary focus in feminist mapmaking (Kwan, 2007). Dominant and disembodied practices of geospatial technologies are criticized for overlooking subjectivities, emotions, feeling, passions, and values of the mapmaker as well as the subjects being mapped (Kwan, 2007). Feminist geospatial technology practices, on the other hand, do not shy away from developing methods to help express emotions, memories, feelings to bring attention to social and spatial injustices (Kwan, 2007). While Kwan also presents several examples of how embodiment and affect can translate into geospatial techniques, she does not attempt to present these as replicable solutions, but rather as a way of thinking. She concludes by further inviting feminist geospatial technologies practitioners to "develop innovative means to protest against the use of geospatial technologies for violence and to engage in political activism that turn violence and fear into hope" (Kwan, 2007, p.30).

To promote a feminist thinking in practices of data visualization, D'Ignazio and Klein identify seven feminist visualization principles (D'Ignazio & Klein, 2020b). Though the mention of feminism hints at an emphasis on gender, the authors frame these principles against any oppressive structure. These principles are (1) to examine power, (2) to challenge power, (3) to elevate emotion and embodiment, (4) to rethink binaries and hierarchies, (5) to embrace pluralism, (6) to consider context, and (7) to make labor visible. The authors posit that although data itself is often considered to be truthful and objective, data science is a powerful tool that can do good or cause harm depending on how the data is used (D'Ignazio & Klein, 2020b). Similarly, maps are an instrument of power with a false appearance of being objective. As such, these principles can also be used as guiding principles and checkpoints for feminist geospatial technologies practitioners.

Theoretical discussions on feminist mapmaking have also translated to mapmaking practices where the cartographers critically incorporated the feminist principles into their designs. For example, dissatisfied with the aggregated and disembodied depictions of Syrian refugees' border crossing experiences that are commonly seen in media, the cartographer and researcher Megan Kelly has developed an alternative

border visualization technique driven by feminist conceptualizations of "the body, intersectionality, reflexivity and transformation"(Kelly, 2019, p. 38). Pirani et al. have created three different thematic maps (a choropleth map, a cartogram, and a tile map) to visualize the same indicator of the SDG on gender equality (Proportion of girls and women aged 15–49 years who have undergone female genital mutilation/cutting) (Pirani et al., 2020). They then tested these different maps to evaluate whether these maps evoked users' emotions and found that despite the sensitive subject, the maps were still found to be clinical and neutral (Pirani et al., 2020). Finally, some researchers also have included a reflexivity statement to acknowledge their own situated knowledges even when their research was not explicitly about power dynamics of mapmaking (Roth, 2020).

2.5. Summary

Unconventional techniques have been developed to convey a sense of place and visualize narratives when conventional methods were not sufficient. Counter-mapping and feminist mapmaking are growing foci of research where assumptions and limitations of cartography are challenged and alternatives are produced. Existing at the intersection of places, narratives, counter-mapping, and feminist mapmaking, my research aims to bring an interdisciplinary approach to cartographic visualization of a neighborhood that has been undergoing rapid changes. While the techniques used in the following chapters are not entirely novel, their applications and evaluations present novel findings. Influenced by and aligned with feminist practices as outlined in this literature review, the techniques developed and used in the following chapters challenge existing cartographic norms and thereby present new possibilities. Furthermore, by studying how these unconventional visualization techniques are perceived by the user, I present advantages and limitations that can aid cartographers in making deliberate choices when considering using conventional or unconventional techniques.

3. THE BEYOĞLU MAP AS A COUNTER-MAP

3.1. Counter-Mapping Data Collection

To answer RQ1 and RQ2, in addition to reviewing the existing literature on counter-maps, I have surveyed an atlas of existing counter-maps and created an inventory of the maps. Each map in this atlas is accompanied by an essay that elaborates on the context in which the map was created (kollektiv orangotango+, 2018). Using 39 maps and the accompanied essays as primary material, I have collected data on the map creators, the purpose of the maps, the data visualized in each map, the source or collection methods of the data, tools and technologies employed in the creation of the maps, the visualization techniques used, and why these techniques were chosen over others. It is important to note that as the essays did not follow a shared structure, not all questions were answered for all of the maps.

3.2. Counter-Mapping Characteristics and Needs

Authorship and Audience

To answer RQ1 (what kind of counter-maps exists), it is important to identify who counter-maps are created by and for whom they are created (RQ1.1). The examples studied for this thesis demonstrate that counter-maps can be created by non-governmental organizations, individuals, community groups, and research collectives. Counter-maps are created often for a community group whose rights and voice have been overlooked or jeopardized by the government's activities or for self-reflective purposes by the mapmakers. When counter-maps are made for self-reflective purposes, the connection between the mapmaker and the mapped subject(s) is clear. In other cases, the following scenarios are observed; (1) there is already research, activism, or service-related connection between the mapmakers and the community, and mapping is explored as a new tool; (2) there is a mapping need in the community and the community reaches out to external groups for assistance; and (3) the potential for mapping is identified by the external group and the connections with the communities are made thereafter.

Topics and Purposes

Another characteristic of counter-maps is the wide range of topics covered in counter-maps, and consequently, the wide range of purposes they have (RQ1.2). Some examples of topics include mapping of informal settlements such as slums, locating underreported sexual harassment cases, indigenous and refugee claims to land, raising awareness to global patterns in knowledge production, and assisting with the organization of protests. What underpins the diverse range of topics that counter-maps engage with is a central issue: there exists a dissatisfaction with how the topic is represented, or even deliberately obfuscated, in the public discourse. As a result, a general purpose for counter-mapping develops: mapping can be used as a tool and a process to counteract this issue.

While this is not an all-encompassing finding, I have identified the following situations to illustrate purposes common among counter-maps:

1. existing maps of an area is not representative of how the area is experienced and/or does not meet the needs of the communities. Therefore, counter-mapping, together with the communities, is used as a collaborative process to create a map that challenges or improves existing maps (Hagen et al., 2018; Martinez Mansell et al., 2018);

2. a group of people disagree with and feel disempowered by a spatial initiative or a policy. The existing spatial representations are solely based on the authorities' perspective and the counter-maps are created to highlight alternative perspectives. As such, counter-mapping is used as a creative tool for problem identification, gathering opposing views, and community building (Geoide en Revolución, 2018; Rekacewicz, 2018);

3. a speculated spatial pattern reveals the inequality or oppression of a certain group. As such, counter-mapping this pattern assists with creating empirical evidence for this situation (Graham et al., 2018); and

4. an ongoing political movement about an issue related to spaces and places needs to create more awareness and attract more members to its cause. As such, counter-mapping is used as a tool by organizers to disseminate information and build action (Liebscher & Fischer, 2018; McElroy, 2018; Segal & Kravitz, 2018).

Data Source and Collection

Counter-maps can use existing datasets in innovative ways or collect their own data when it is not readily available. Depending on how the data is acquired, counter-maps can exist on a spectrum of being data-driven or idea-driven (RQ 1.3). An idea-driven counter-map is one where the dataset for the intended purpose does not yet exist. In these cases, data collection becomes a necessary part of the counter-mapping process. For example, dissatisfied with the common depictions of Port Said, a city in Egypt, by states involved in foundation of the Suez Canal, tourists guides and state registers, Nermin Elsherif maps the city from the people's perspective and creates a "counter-history" (ElSherif, 2018). To do so, she has collected both qualitative and quantitative data about the city's cultural history through workshops, interviews, and archives.

A data-driven counter-map is one where the mappers use an existing data set and subvert its typical uses and visualizations through mapping processes, atypical uses, and intended audiences. An example of this is Knitted Flood Wall, which uses an official dataset from Catchment Flood Risk Assessment and Management Study in Dublin, Ireland (O'Brien, 2018). While a typical velocity map using this data had already existed, Martine O'Brien and community members created a large-scale knitted map to articulate the need for an immediate installation of a flood defence wall. The project was a collaborative effort involving residents affected by the floods, enabling dialogue and establishing a stronger bond within the community as a result of the counter-mapping process.

It is important to acknowledge that, being data-driven or idea-driven is a spectrum rather than a binary categorization and many counter-maps use a mixture of methods and combine existing datasets with newly collected ones.

Technologies and Tools

From the ideation to the execution of counter-maps, technologies and tools used in counter-maps are highly varied and context dependent (RQ2.1). Examples of low-tech methods used include embroidering, knitting, drilling, using sketching tools such as pens, markers and papers (Krygier & Wood, 2018; O'Brien, 2018; Olmedo, 2018; Wagner Berno de Almeido et al., 2018). It is also common to see more advanced technical methods involving GPS and GIS technologies, scripts and programming, and vector editing software (Graham et al., 2018; Kartographische Aktion, 2018; Ledermann, 2018; Liebscher & Fischer, 2018).

Usually, the decisions regarding the tools and technologies are influenced by the capacity and resources that are available to the organizations and community groups, as well as the intended use of the final mapping product. In some cases, data collected through low-tech methods and participatory methods are passed onto professional cartographers and designers for combining various types of data and creating a more aesthetically coherent product (Moss & Irving, 2018). However, in other cases, the process and the message of the counter-map are more important than the visual outcome and no further edits are pursued.

Visualization Techniques

Looking at the diverse visualization techniques used in counter-maps and the reasons for which they were chosen, one can establish a close relationship with the purpose of the map and what characteristics they need in order to accomplish that purpose (RQ2.2, RQ2.3). These characteristics can be broadly categorized into three needs: a need for formality and intuitive legibility, a need for re-claiming places and raising awareness, and a need for expression and disruption.

Maps in need of formality and intuitive legibility tend to have characteristics that are widely used and recognizable. They often have a title, a legend, an explanatory text, and they use clear and familiar cartographic variables. As a web map or a mobile map, they might also offer interactivity. These familiar characteristics enable the map to be used as empirical evidence in formal settings such as court cases and news stories (Devulapalli & Jonnalagadda, 2018; GeoComunes, 2018). Additionally, for some counter-maps that deal with sensitive topics such as sexual harassment (HarassMap team, 2018), or time-sensitive topics such as a rescue effort (Liebscher & Fischer, 2018), it is imperative that one can perform actions as quickly as possible.

Maps in need of re-claiming places and raising awareness often have some elements of conventional cartographic visualization, but are highly customized whether through artistic choices such as visual style or composition. As these maps do not have the pressure of appearing formal or being efficient to aid a certain task, they are more flexible and present themselves as a cartographic playground where experimentation and play can be done. It is particularly interesting the ways in which these counter-maps adapt characteristics and capabilities of conventional maps to their needs. Maps that fall into this category can be mental-maps (Reiss, 2018), sketch maps that are produced as a result of participatory methods (Moss & Irving, 2018), and maps and graphics that are presented in unfamiliar ways that disrupt legibility through methods including, but not limited to, overlapping composition, distortion (Mason-Deese et al., 2018).

Finally, maps in need of expression and disruption are some of the most unconventional maps that challenge the basic assumptions of what a map can or cannot be. Although the process of mapping, whether individually or collectively, can be used, and the issues being address might be of spatial nature, the final products appear highly experimental. Examples of this include use unaltered aerial imagery to highlight shocking levels of environmental degradation (Imaginando Buenas, 2018) and conceptual maps that prioritize relations over spatial accuracy (Bloom, 2018; Geoide en Revolución, 2018; Working Group Critical Geographies of Global Inequalities, 2018).

Overall, counter-maps are inherently diverse, experimental, and not always guided by existing cartographic norms and principles. It is important to note that the categorizations and groupings used in this discussion are not always mutually exclusive and may contain overlaps and should not be treated as a comprehensive guide to the counter-mapping practises as many other examples exist outside of the atlas that was used for this research. Nonetheless, this analysis serves as a unique contribution to the existing body of literature on counter-maps: a working and flexible framework to understand the decisions that are made while counter-mapping and the reasons why individuals and groups counter-map in the first place.

3.3. Beyoğlu Data Collection

To answer the case questions about Beyoğlu - *I Will Survive* map under RQ1 and RQ2 and to collect data for the creation of the visualizations for RQ3, I have communicated with and received data from the Center for Spatial Justice (Mekanda Adalet Derneği or MAD).

Center for Spatial Justice is a non-governmental organization based in Istanbul, Turkey, which focuses on issues such as environmental justice, right to the city, democratic participation, and more. Interdisciplinary in their methods, they engage in a variety of activities including, but not limited to, research and publication, documentary and video activism, walks, and mapping (Mekanda Adalet Derneği, n.d.). Beyoğlu - *I Will Survive* is a participatory mapping project that MAD undertook in 2018 in order to highlight places that have significantly contributed to the neighborhood's character and have been lost or threatened by gentrification and recent urban development projects in the area.

Beyoğlu was chosen for this project as it is a diverse neighborhood with a rich history, and its rapid changes are disproportionately affecting marginalized groups whose use of the area is being forcibly altered. Home to many theaters, cinemas, cafes, bars and nightlife, Beyoğlu brings people from across society into the area. It is also influenced by Turkey's non-Muslim minorities, although this population has been historically shifting away from the neighborhood due to political tensions. Finally, the public spaces in the neighborhood are venues for political activities such as marches and protests. Some of the city's oldest buildings are also in this neighborhood; yet, they are being irrevocably altered through renovation projects that pay little respect to the originals. The political activities are being shut down by increased control of public spaces. The small businesses are being priced-out or evicted as a result of gentrification and large-scale development projects. Overall, there is an evident issue of spatial injustice and MAD has identified a need for action and intervention (beyond.istanbul, 2018).

While the changes of the Beyoğlu neighborhood are primarily driven by the government and the decision-makers, it impacts the citizens who live in, work at, or frequently visit the area. Counter-mapping was

selected by the organization as a tool to reach out to and engage with the citizens who are affected by this change and yet, whose voices are not heard. In addition to the participatory aspect of the process, the map as an artifact has the potential to reveal that the loss of a place is often not an isolated instance, but rather a spatial pattern. It is important to also note that Beyoğlu - *I Will Survive* map is not a stand-alone project. It is accompanied by a video documentary project titled "Faces of Beyoğlu", which consists of short interviews with shopkeepers of longstanding small businesses. The ninth issue of beyond.istanbul, MAD's regular publication that showcases academic and opinion articles, is dedicated to Beyoğlu and spatial justice. As such, the map itself is not a be-all-and-end-all solution but rather, it is a part of a bigger effort and comes with its own advantages and disadvantages.

MAD has collected data about which "places of memories" exist and memories, thoughts, and feelings people associate with these places. The data for the map was collected through participatory methods. This included an online survey, questionnaires distributed in local shops, interviews with local experts, as well as several walks. Depending on the method with which the data was collected, the format and the level of detail can vary. At its least detailed, it included the name of a memory place, the rough address, and whether it is *transformed*, *disappeared*, *moved*, or *surviving*. At its most detailed, it included a story that the participant associates with the place of memory, in both English and Turkish, and historical facts about how and why the place has changed.

In my thesis, for the purpose of consistency, I focus specifically on the memory places that were collected through the online survey and are accompanied by a memory. The final database used consists of a total of 58 memories. 14 of these memories were provided only in Turkish and has not yet been translated into English. Only in these cases I have completed translations myself. In other cases, I have not edited any existing memories or the accompanying translations. Among these 58 memories, 41 distinct places are mentioned. These 41 places are distributed into four categories — *transformed*, *disappeared*, *moved*, and *surviving* —as it can be seen in the chart below (Figure3.1). *Surviving* memory places refer to places that continue to exist and *closed* memory place refer to those that no longer exist. *Transformed* memory places that exist in the same location but had changed significantly, whereas *moved* places still exist, but was forced to relocate.

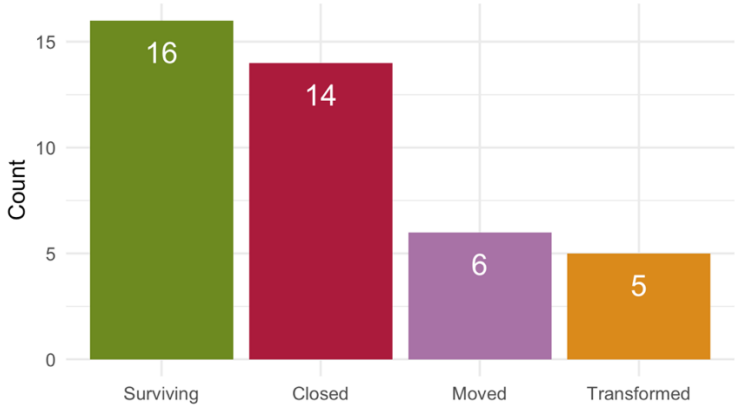

Figure 3.1 Types of memory places

To give a sense of the data structure, one of the shortest and one of the longest memories are provided below as examples (Table 3.1).

Table 3.1 Sample memory places and memories

Name	Address	Use	Status	Memory
Üçüncü Mevkii Restaurant	Öğüt Sk. 18/A	Restaurant	Closed	We grew up there.
Emek Cinema	Hüseyinağa Mahallesi, Yeşilçam Sk. No:5	Cinema	Closed	I started living in Istanbul in September 1997. I watched my first movie in Emek Theatre as part of the Istanbul Film Festival in April 1998. It was Istvan Zsabo Mephisto. The movie was screened in honor of the lifelong success award granted to Istvan Zsabo. I was 19 years old at the time. More than the movie itself, I was touched by the street and to be in such a magical and magnificent place. Looking back, I understand now what a privilege it was to having watched in Emek the hit movie of the time, Memento, and one of the classics, Brasil. The meeting in which we were to found Altyazı took place right after the screening of Liv Uliman's Trolösa, again in Emek in 2001. When I got back at the end of 2009 after 5 years of not living in Istanbul, Emek was closed. There were talks of its possible demolition. We worked very hard, but we failed not only to preserve it as part of our lives, but also to leave it for coming generations.

3.4. Beyoğlu Map Characteristics and Needs

Comparing the data collected for the case of Beyoğlu – *I Will Survive* map to the data collected about counter-mapping practices, it becomes visible what kind of a counter-map Beyoğlu – *I Will Survive* is and what it needs and requires as a counter-map. In terms of the relationship between the mapmaker and the mapped topic, Beyoğlu – *I Will Survive* map is one of the many ways the organization MAD engages with the neighborhood and its afficionados. As such, counter-mapping is explored as a new tool and supplements the existing research, activism, and services MAD provides. The mapping process acts as a creative tool to gather opinions and raise awareness to the spatial injustices that those who contributed to the map disagree with and feel disempowered by. The project can be considered idea-driven as the data was collected specifically for this project and its vision.

For Beyoğlu – *I Will Survive,* the final map should highlight alternative perspectives and marginalized narratives that otherwise go unnoticed. While the map does not need to appear formal enough to be recognized in court or efficient enough to aid in navigation, it cannot be a completely disruptive map as the issue at hand is highly spatial nature and it needs to be at least recognizable as a map. Ultimately, Beyoğlu map wants to bring attention to an issue that is not discussed on mainstream platforms and raise awareness to how this issue effects people. As such, there is a need to creatively reclaim space while encouraging the map reader to get involved.

4. VISUALIZATION DEVELOPMENT

In this section, I present the visualization techniques that I use for the relevant research questions (RQ3.1–3.3) and share the process of creating them. Each of the following subsections focus on an aspect of the data collected about the memory places and a feminist visualization principle related to that aspect. In each case, I have created a conventional map and an unconventional map or a map series. While the maps are included in this section, a full-size version of each map can be found in the Appendix (see Appendix A).

Although there are many ways to define what might be conventional and unconventional, for the purposes of this thesis, it was determined based on the earlier discussions of the examples from the literature and counter-maps studied. The maps created in this research are considered conventional when they follow cartographic tradition and use well established cartographic visualization techniques. These maps appear similar to maps created by official mapping agencies or maps that serve to more practical purposes such as navigation or locating a certain phenomenon. The maps that are considered unconventional when it adopts visualization techniques from artistic maps and counter-maps that are more concerned with creative expression rather than aiding a certain task.

4.1. Spatial Distribution of Memory Places

One of the aims of the Beyoğlu - *I Will Survive* map is to present Beyoğlu in a way that reflects how the people who care about Beyoğlu experience the neighborhood. To do so, it is necessary to bring together multiple voices and present it as a collective view. From a visualization point of view, a relevant question is how the memory places can be mapped such that the voices contributing to the map can be combined and presented in a way that challenges how the neighborhood is typically viewed. The feminist visualization principle of **embracing pluralism** can be helpful in answering this question. This principle encourages anyone who works with data to embrace the messy data that can come out of processes that involve participants. Because when an emphasis is put on clean and tidy data, it is possible that nuance can be lost (D'Ignazio & Klein, 2020b). This principle is applied within this project by bringing together the voices of people who are directly affected by issues concerning the Beyoğlu neighborhood such that a more specific and truthful representation can exist.

The following maps aim to visualize the spatial distribution of the memory places in Beyoğlu. Map A (Figure 4.1) is a conventional map that shows the approximate location of each memory place overlayed onto the map of Beyoğlu. It is considered to be conventional because it uses a base map that relies on a closed-world assumption and uses a consistent scale. A closed-world assumption refers to the completeness of the data; for example, if a park is represented on a map, every other park at a comparable scale should also be represented (Mocnik & Fairbairn, 2018). Another conventional aspect of this map is how each memory places is represented; the locations of the memory places are added as a point layer that can be identified in the same way one can identify huts on a printed hiking trail map or search for a nearby café using an online service.

Figure 4.1 Map 1A - Spatial distribution of memory places

Map B (Figure 4.2), on the other hand, is considered unconventional for two main reasons. First, as opposed to a conventional map, it relies on an open-world assumption. This means that not everything at a given scale is included; the map only shows what is relevant (Mocnik & Fairbairn, 2018). In this case, this refers to the area where the memory places are located. Memory places can refer to a specific shop with known coordinates, a large park, a passage, or a street. Not only these places vary in size and shape, but also the coordinates referring to the place are not known precisely. To account for this variability and to create a more coherent visual impact, a buffer from each point was created. The buffered area was then combined into an irregular polygon, which combined all of the memory places and was the only area shown on the map.

Second, the map is distorted and no longer has a consistent scale. The intention behind this was to emphasize that importance of the places on the map is not uniform. This means that there are places more important to those who took part in the project, which they have mentioned, and less important places, which they have not. The visible area where the memory places are located holds much more significance for the people who have contributed to the Beyoğlu - *I Will Survive* map. As such, distortion is used to exaggerate the visible area and make it more present and attention-grabbing on the map. The original points for the memory places were removed to create a collective view of the Beyoğlu neighborhood.

Figure 4.2 Map 1B - Spatial distribution of memory places

From a more practical point of view, the buffering, filtering, and distorting processes were all completed within the vector editing software Adobe Illustrator without any help from additional software or algorithms. They are proposed as potential visual solutions to convey the sense of place that is communicated within the submitted memories in an alternative way to the conventional point map. The relevant importance of the places and the multiple voices are aspects of the data that one can only access after reading the memories themselves. This process is not the intended as the solution but rather an imagination of what the map could look like if we paid as much attention to the content of the memories as well as the physical location of the memory places, which is definitely a more comfortable format for GIS software.

4.2. Four Types of Memory Places and Associated Memories

Another important aspect of the memory places is the 4 categories they represent: *remaining*, *transformed*, *moved*, and *closed*. In an interview, Center for Spatial Justice mention that they wanted to give disappeared and disappearing memory places visibility while highlighting that some resistance can still be found in remaining memory places (beyond.istanbul, 2018). These sentiments go beyond the 4 categories. To understand how the disappearing of the memory places have an impact on the people and the ways in which people cherish the remaining memory places, one needs to get better acquainted with the memories themselves. This requires including of the memories on the map and in the best-case scenario, trigger an emotional response associated with the memory places. Furthermore, as each memory comes from an individual and carries their unique experiences, the relevant feminist visualization principle in this case is **to elevate emotion and embodiment**.

The following maps aim to visualize the 4 categories of memory places and the associated feelings through direct inclusion of memories. Map A is a conventional stand-alone map that uses color hue as a variable to represent the categories and callouts to connect each memory place to the memories. Color hue was selected as it is a typical and effective variable to communicate nominal data (Roth, 2017). However, there are other conventional visual variables, such as shape, orientation, or texture, that could have also been used to communicate nominal data. It is important to note that not all of the memories are presented, as even with the callouts, there would not have been enough space to fit all the memories onto the map. As a solution, the map visualizes a representative sample, where the number of places that belong to each category is proportional to their fraction within the entire dataset (Figure 3.1).

Figure 4.3 Map 2A - Types of memory places and memories

Maps B1–B4 (Figure 4.4) form an unconventional map series that consist of four maps. Each map is dedicated to one of the four categories. For the *surviving* category, the memory place is the only visible part of the map. Whereas the *closed* memory place appears as if it is erased from the map; everything else but the memory place is visible. For the *moved* and *transformed* categories, an in-between approach is used. The entire map can be seen; however, the memory places are visible at a higher opacity than the rest of the map. When possible, the maps are accompanied with facts associated with the places and how they have changed.

The placement of the text is determined by the category each place belongs to, as well as the content of the memories submitted about that place. The memory about Gezi Park (*surviving*) frames the parameter of the park. As this memory forms a narrative of how the participant's experience with the park have influenced their life decisions, it is presented in three parts that follow the narrative structure. The memory about Hazzopulo Passage (*transformed*) imitates the experience of going through a narrow passage between buildings. Multiple memories are placed around the passage. The memories about Inci Pattisserie (*moved*) move from the Pattisserie's original premise to where it operates from. Finally, the memory about Ataturk Cultural Center (*closed*) marks where the old Ataturk Cultural Center was before it was demolished in a splatter-like texture. The information regarding the depiction of the categories and the placement of the text are intentionally not revealed to the user. This is because the purpose of the maps is not to propose a new cartographic language that can help efficiently identify the different categories, but rather to pique curiosity and evoke an emotional response through a more intimate interaction with each place and memory.

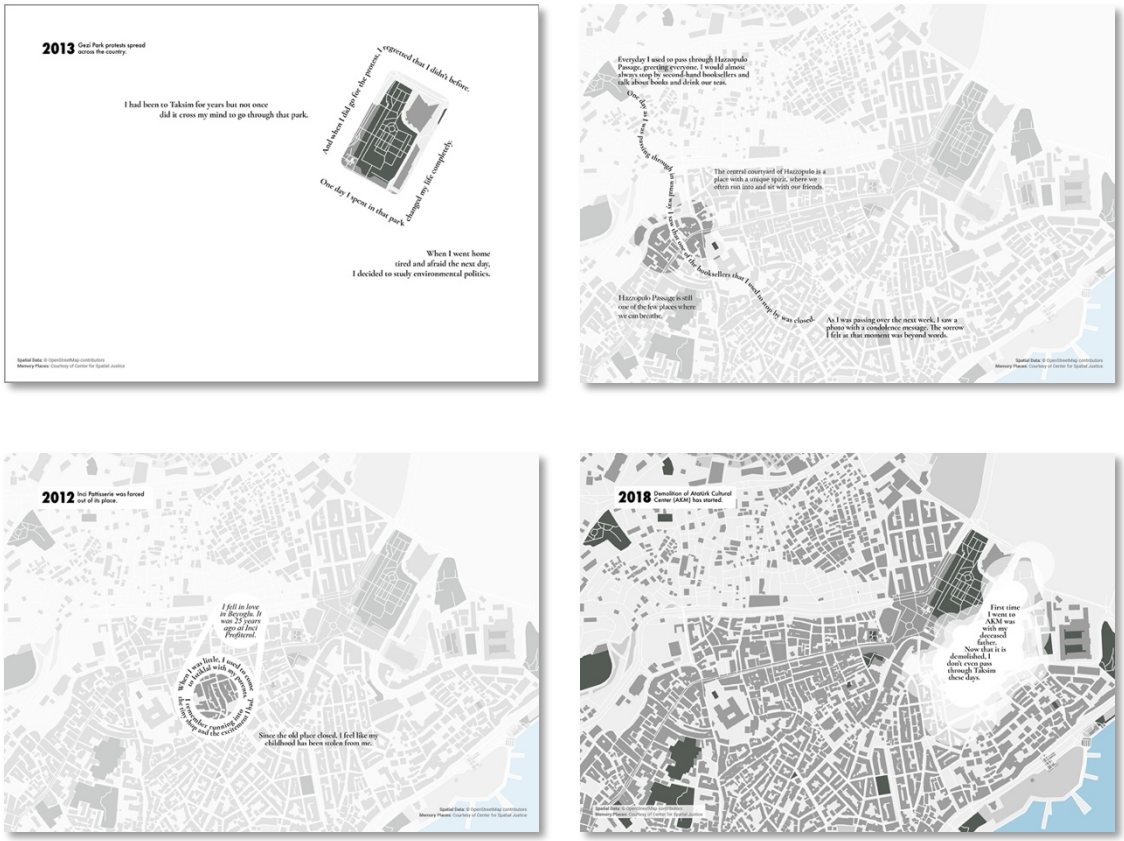

Figure 4.4 Maps 2B1–2B4 - Types of memory places and memories (top left - 2B1 - surviving, top right - 2B2 - transformed, bottom left - 2B3 - moved, bottom right - 2B4 -closed)

4.3. The Content of the Memories

The third and final pair of maps focus on visualizing the content of the memories themselves with and without the use of GIS technologies. Sketched maps are frequently used in counter-mapping practices, because they can be easily produced as an outcome of participatory mapping practices (kollektiv orangotango+, 2018). Participants can contribute without having professional mapping experience or prior knowledge of any software. These maps can be created with as little as pen and paper. The visual outcome of maps that are done with GIS technologies can look strikingly different than those that are done with more analogue techniques such as sketching. As sketched maps diverge from more authoritarian maps in their appearance and sketching as a technique is more accessible than state-of-art mapping technologies, the relevant feminist visualization principle in this case is to **challenge power and aspire to empowerment**.

The following maps aim to visualize the content of the memories. Map A (Figure 4.5) is a conventional map that visualizes the approximate location of the memory places and uses a numbering system to match a sample of the memory places to the full text that was submitted. It highlights 5 memory places and the associated memories as a sample. This number was selected because it could be viewed comfortably on the map size and scale that are used consistently on this research. The map depicts the neighborhood in a familiar way; regardless of the viewer's familiarity of the area, they are presented with familiar depictions of land, roads, parks, and, buildings. To get a sense of the neighborhood, what is happening there and why this map might be created, it is necessary for the viewer to identify a number, find the text that matches the number, and read the text in full.

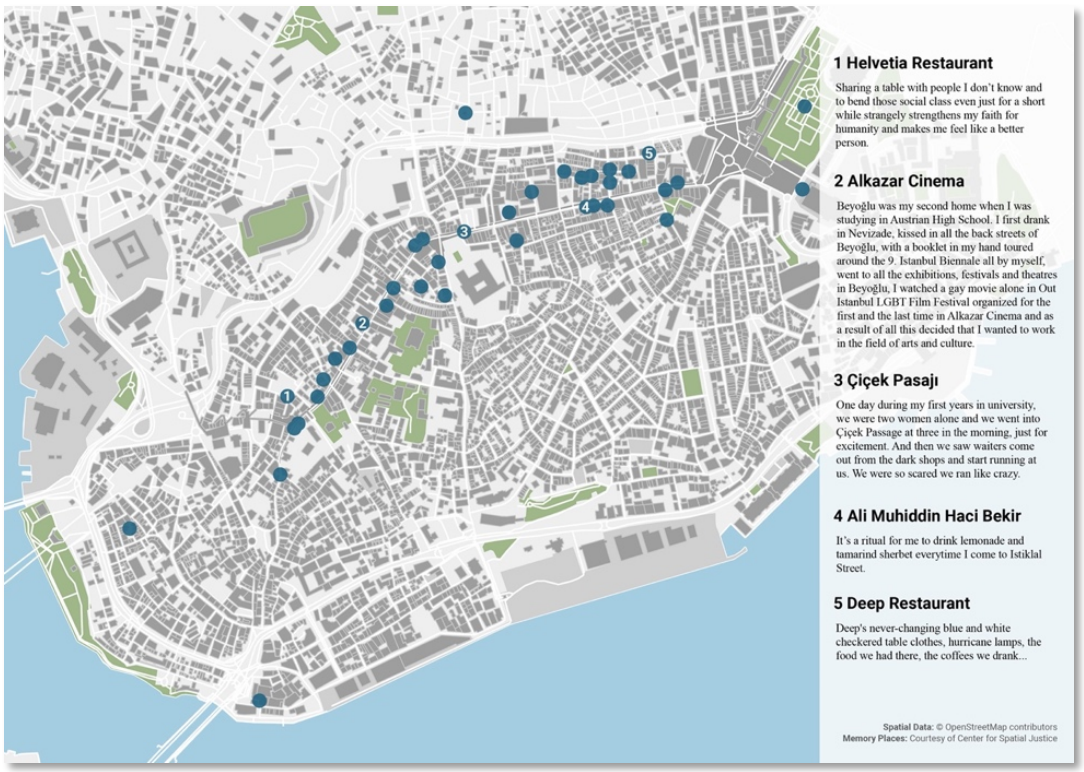

Figure 4.5 Map 3A - Content of the memories in text

Map B (Figure 4.6) is an unconventional map that uses sketches and a hand-drawn style to communicate the content of the memories that were submitted. While maintaining some geographical references, such as the coast line, main roads, and significant parks, the map is mostly populated by hand drawn depictions of the memories. Instead of including the memories in their entirety, each memory is shown by a combination of a sketch and keywords that can be picked to summarize the gist of the memory. It is important to note that as this is ultimately a process of selection and abstraction, a decision had to be made by myself and added an additional layer of subjectivity to the map.

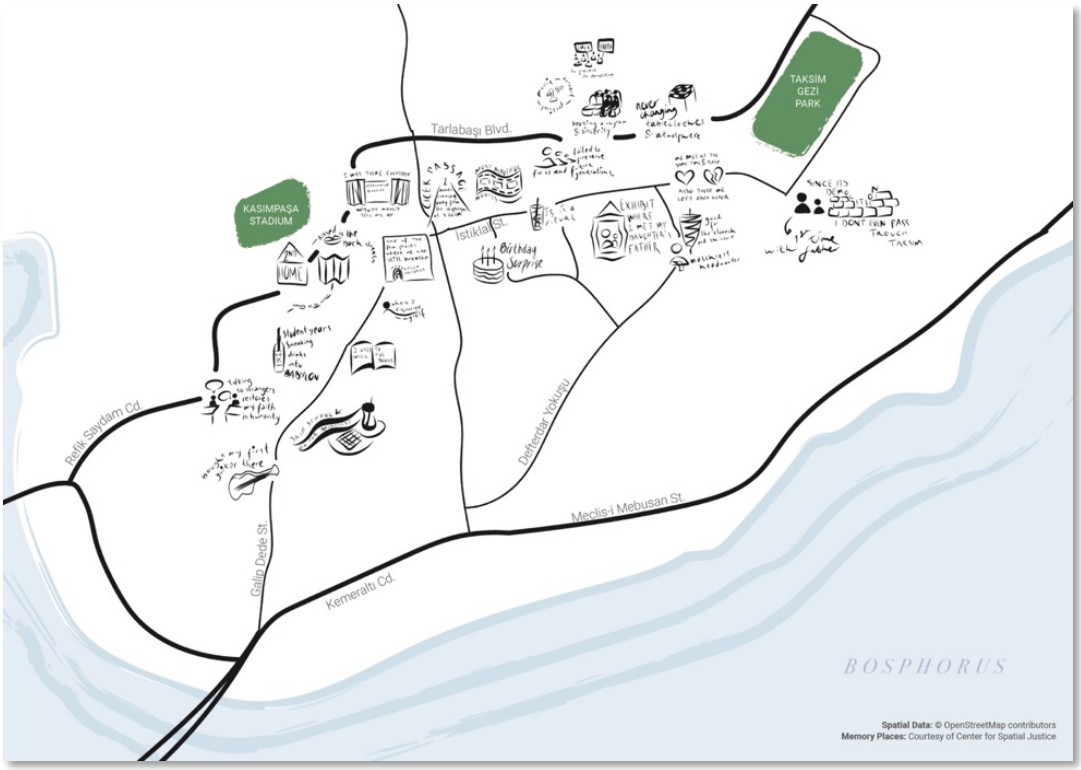

Figure 4.6 Map 3B - Content of the memories in sketches

5. USER STUDY DEVELOPMENT

The previous section provides an account of how the visualizations for this research were created. In so doing, it elaborates on the rationale behind how these visualizations are intended to answer research questions RQ3.1–3.3. This section introduces the methodology that was set up for the evaluation of these visualizations. This evaluation will help answer RQ3.4 and RQ4.

5.1. Setting and Structure

To evaluate the effectiveness of the visualizations, this research uses a questionnaire which allows for quantitative analysis. SoSciSurvey.de was selected as a platform to host the questionnaire due to its robust functionalities tailored for widespread use within the social sciences. In addition to the platform's GDPR compliant security policies, to address any potential ethical concerns, recommendations and an approval was obtained from the ITC Ethics Committee (see Appendix B). Consequently, the questionnaire was designed to make sure that all participants remain anonymous and no potential harm is caused through participation in the questionnaire. After receiving the necessary approvals, the survey was disseminated through Facebook, LinkedIn, Twitter as well as communication channels and social media accounts of the organization Center for Spatial Justice.

The main structure of the survey of included a consent form, information about the neighborhood and the project, questions about the participants, and questions related to the visualizations presented in this order. The questions related to the visualizations were split into three main parts that matched with the research questions they aim to answer. All three sections were identical in their set up to make sure that the user could easily navigate the survey. Within each part the user first read a brief informational text that prefaced the maps they were about to see. After clicking next, they first viewed MAP A, the conventional map, and were given as much time as they needed to view it. After clicking next again, they viewed MAP B, the unconventional alternative, and were again given as much time as they needed to view it. Finally, the user landed on a page with statements about the maps and their experience of using them. As the survey did not allow the participants to go back, the maps were provided again for reference. Provided with the option to view the maps again, the user was then asked to rank the same statements for Map A and Map B using a 5-level Likert scale as shown below (Table 5.1).

A complete copy of the survey can also be found in the Appendix (see Appendix C).

Table 5.1 Likert scale responses and attributed values

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

5.2. Content Development for the Questionnaire

The statements by which the users evaluated the maps were developed to answer the research questions RQ3.4 (Do the identified unconventional visualization techniques serve for the above-mentioned purposes?) and RQ4 (What insights can be generated from the process of developing and evaluating content-driven visualizations for Beyoğlu - *I Will Survive* map case study for the wider context of counter-mapping and beyond?).

To address RQ3.4 each statement was written to assess whether the intentions of each map align with and serve the feminist visualization principles relevant for the sub-questions RQ3.1–3.3. As such, the statements differ for each part of the questionnaire. These statements were created only to compare the maps that were created within the same part. While they could be used to evaluate other maps as well, the purpose here was not to find a map that performs the best, but rather to assess to what extent the user experience matches the intention of the cartographer. These intentions of each part, the statements, and a guide for the interpretation of the statements are as shown below (Part 1: Table 5.2, Part 2: Table 5.3, Part 3: Table 5.4, Common: Table 5.5).

Table 5.2 Statements for Maps 1A and 1B

Aim	Statement	Interpretation
to quantify the ability of the maps to communicate a collective sense of place in a pluralistic way	The map combines different memory places.	A higher value is associated with a collective representation.
	The map preserves individual memory places.	A higher value is associated with an individualistic representation.
to quantify whether the maps are able to communicate the relative importance of the memory places.	I can identify the more important places on the map.	A higher value is associated with a higher emphasis on places that are more important to the people whose memories are represented.
	I can identify the less important places on the map.	A higher value is associated with a higher emphasis on places that are *not* as important to the people whose memories are represented.

Table 5.3 Statements for Maps 2A and 2B1–2B4

Aim	Statement	Interpretation
to quantify the extent at which the maps do justice to the emotional aspects of the memory places and trigger an emotional response.	The way the memories are presented is evocative.	A higher value is associated with a better ability to trigger an emotional response.
	The layout of the memories, as opposed to the memories themselves, makes me care about the places shown.	A higher value is associated with ability to use cartographic means to enhance text and convey the emotional aspects of memory places.
	The map(s) makes me think of a place that is important to me and empathize with those who have lost memory places.	A higher value is associated with a better ability to trigger a personal and empathetic emotional response.
to quantify the ability of the maps to embrace the subjectivity of the data handled and to elevate the embodiment principle of feminist visualization by focusing on the uniqueness of individual experience.	The map(s) help me understand how changes in Beyoğlu affect each individual differently.	A higher value is associated with better communication of the uniqueness of individual experience.
	I consider the map(s) to be objective.	A higher value is associated with a lesser ability to embrace and communicate the inherent subjectivity of the data.

Table 5.4 Statements for Maps 3A and 3B

Aim	Statement	Interpretation
To quantify the extent at which the maps challenge cartographic depictions of the neighborhood that omit people's perspectives.	The map reveals experiences that are otherwise invisible.	A higher value is associated with an improved ability to render experiences visible.
	The map seems official.	A higher value is associated with a representation of the neighborhood comparable to that of the status quo.
	The map shows the neighborhood from the people's perspective.	A higher value is associated with a more people-centric representation of the neighborhood.

To quantify the extent at which the maps encourage the reader to contemplate and act on protecting memory places.	After seeing this map, I am motivated to take action to protect the remaining memory places.	A higher value is associated with an increased willingness to take action.
	The map invites me to learn more about the memory places.	A higher value is associated with an increased willingness to learn more about the memory places.

To address RQ4 the same statements were added to each section to allow for a more comprehensive comparison between all conventional and unconventional visualization techniques that were used in this study.

Table 5.5 Joint statements for all maps

Aim	**Statement**	**Interpretation**
to quantify possible advantages and limitations of using conventional or unconventional techniques in a more general sense. These statements are repeated in the following questions.	The map is memorable.	A higher value is associated with a long-lasting impact.
	I find this map easy to understand.	A higher value is associated with presenting information in an easily accessible way.
	I would like to spend more time with this map.	A higher value is associated with better ability to pique the user's curiosity.

5.3. Statistical Methods for Questionnaire Analysis

A variety of charts and statistical methods were selected to analyze the data collected through the Likert scale statements as stated above. Although the different levels of the Likert scale are represented with numeric values within this thesis, they have to be treated as ordinal values rather than nominal. This is because based on the participants' interpretation, the distance between different scales such as "Strongly Disagree" and "Disagree" might not be the same as the distance between "Agree" and "Strongly Disagree" (Sullivan & Artino, 2013). As such, the data may not be considered as interval. There is, however, an agreed sense of direction ("Strongly Disagree" being the lowest level of agreement and "Strongly Agree" being the highest) in which the data can be ordered. As a result, statistical methods appropriate for ordinal data can be used to generate valuable insights.

After the data is collected, the results will be first visualized using stacked bar charts for each statement and map type. The median will then be used as a descriptive statistic to identify the central tendency of the answers. If there is an apparent difference between the descriptive statistics for Map A and Map B, a suitable hypothesis test will then be used to ascertain whether this difference is statistically significant and an effect size will be calculated to indicate the direction and the strength of this difference.

Since Likert Scale data is not normally distributed and treated as ordinal, parametric tests are not appropriate. The data collected is in pairs because a ranking for each statement was collected for both Map A and Map B in each section. Furthermore, the samples are related as the same users ranked the statements after having viewed both Maps. **Wilcoxon Signed-Rank test** is selected for hypothesis testing because it is the most appropriate for the characteristics of the data collected (cf., e.g., Coolican, 2019, p. 489). Wilcoxon Signed-Rank test returns a *V* value and a *p-value* for each statement. The null hypothesis (H0) "There is no significant difference between how the users ranked Map A and Map B" is rejected when the p value is lower than 0.05.

When the null hypothesis is rejected, the effect size will be calculated with an *r value*. Common ways to calculate the effect size, such as Cohen's *d*, are not suitable for ordinal data as they do not meet the assumptions (Fritz et al., 2011). The recommended way to calculate the effect size for ordinal data evaluated through Wilcoxon-Signed Rank test is the **r value**, which is another Cohen statistic. The r value is interpreted as: 0.1 small effect; 0.3 moderate effect; 0.5 large effect (Coolican, 2019, p. 509). It is important to note that the effect size is not able to imply a causality, but should rather be interpreted as "the degree to which the null hypothesis is false" (Cohen, 1988, pp. 9–10). Due to the ordering of the two measurements, a positive effect size implies relatively higher rankings for Map B and negative effect size implies relatively higher rankings for Map A.

6. QUESTIONNAIRE RESULTS

After its publication date, the questionnaire was available for two weeks. During this time, the survey was attempted 264 times in total. Within these 264 respondents, 103 have reached the final page and answered all questions concerned with the visualizations. There are a few possible reasons for this number of incompletions: respondents may have started the survey out of interest but had no intention of completing it; as they progressed through the survey, respondents may have lost interest or thought it would take less time; and finally, some respondents may have started the questionnaire on a mobile device and thus, were unable to proceed to the end.

6.1. About the Respondents

While no demographic information that could be traced back to the individuals was collected, respondents were asked two questions regarding their knowledge of the neighborhood and their cartography experience. These questions help get a sense of the demographic that the results represent. While analyzing the results of the survey for different demographic groups is beyond the scope of this research, the collected demographic data can help identify possible limitations of the research and further research opportunities.

The waffle chart below illustrates the respondents' varying levels of knowledge of the Beyoğlu neighborhood. Most participants had little or no knowledge of the neighborhood (85); they have not heard about the neighborhood before the questionnaire or they might have seen a couple of headlines about it. Some participants identified as having expert level knowledge of the neighborhood (7), meaning that they might have lived in the area or visited frequently, whereas others claimed having some knowledge through their own or friends' experiences (5). Remaining respondents preferred not to answer the question (6).

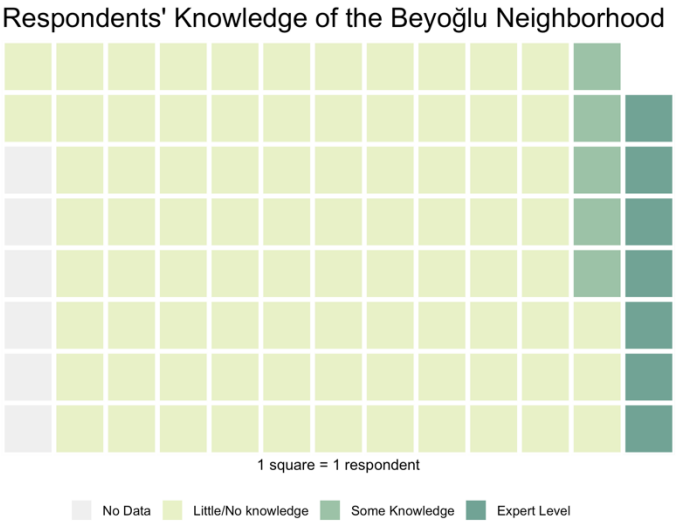

Figure 6.1 Waffle chart visualizing the distribution of the respondents' knowledge of the neighborhood

The following chart illustrates the respondents' varying levels of experience with cartography, which was in this case measured by the frequency and reasons for making and using maps. The respondents consist of those who rarely use of make maps (13), those who make or use maps for personal reasons (16), those who make or use maps at a professional level (47), and those who make or use maps for both personal and professional reasons (27).

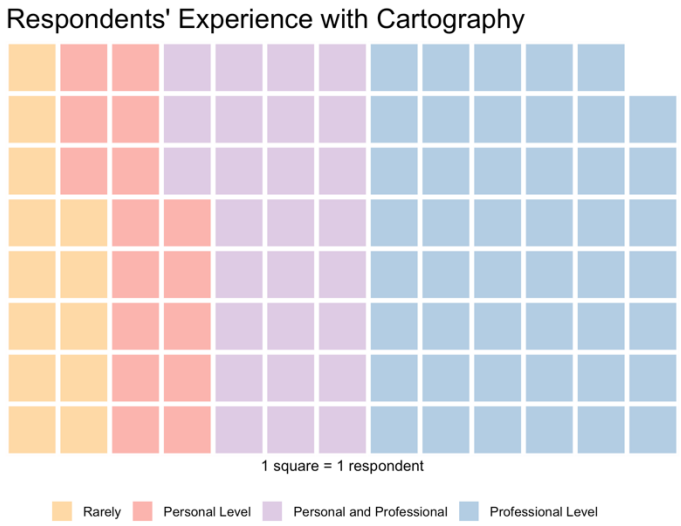

Figure 6.2 Waffle chart visualizing the respondents' experience of cartography based on the extent at which they make or use maps

6.2. Part I: Spatial Distribution of Memory Places

The chart below visualizes how the respondent's rankings of Map A and Map B are distributed among different Likert scale answers for each statement. At first glance, Map A appears to be ranked generally higher than Map B for all of the statements. This difference is starker in statements such as "the map preserves individual memory places" and "I find the map easy to understand" compared to statements such as "the map combines different memory places" and "the map is memorable."

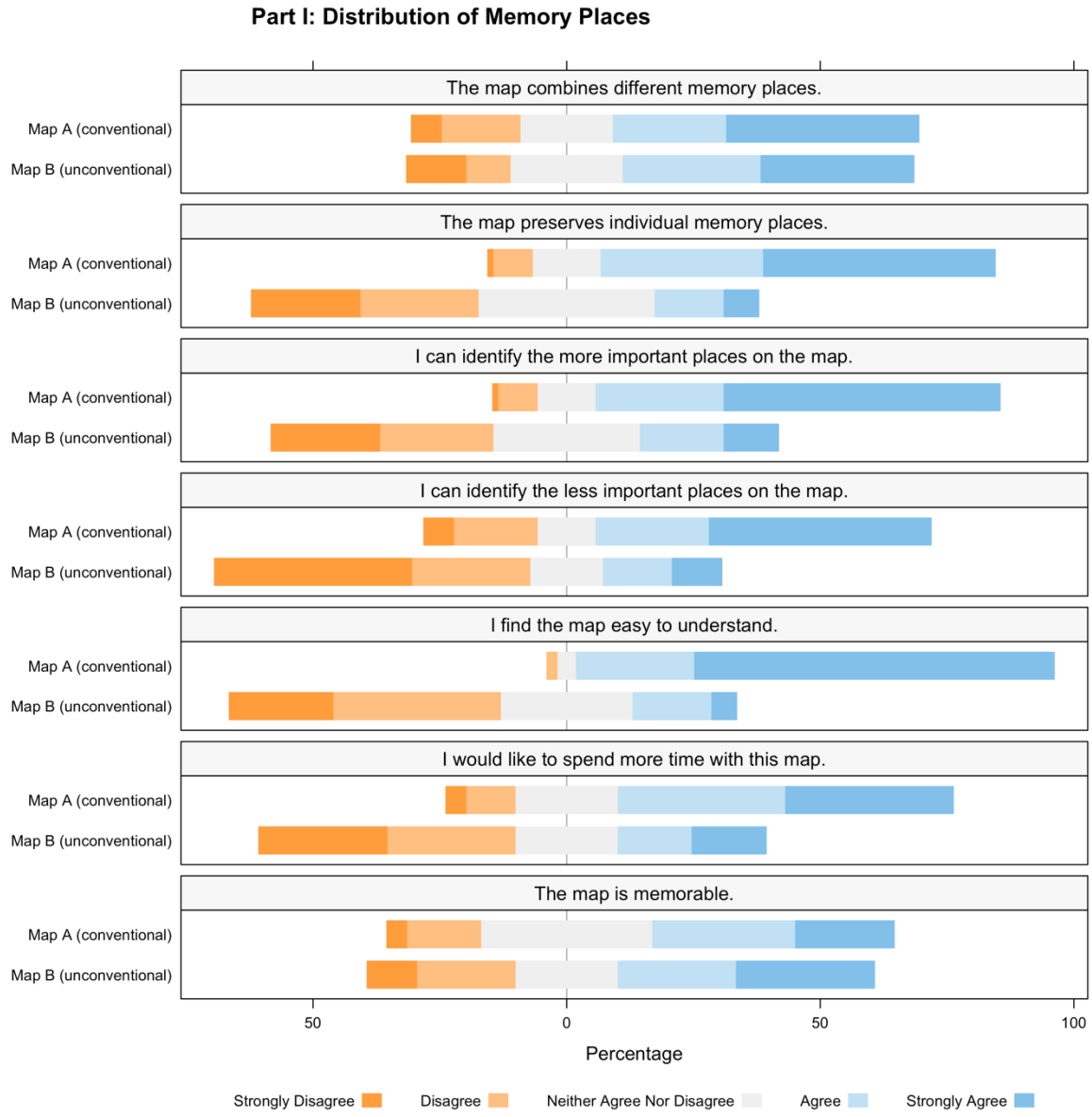

Figure 6.3 Stacked bar chart visualizing how the respondents' ranking of statements about relative importance and collective voice change based on the map type

The table below reports how the median answer differs between the conventional and unconventional visualization techniques. For most sentences, the median answer is higher for Map A (conventional) than Map B (unconventional), conforming to the expectations from the stacked bar chart. However, for two statements, different outcomes are observed. For the statement "the map combines different memory places," the median answers for both Map A and Map B are the same (4 / Agree). For the statement "the map is memorable," the median answer for both Map B (4 / Agree) is higher than Map A (3 / Neither Agree Nor Disagree).

Table 6.1 Median of Likert scale statement rankings for Maps 1A and 1B

The Median Answer for Each Statement by Map Type	**Median**	
	Map A	**Map B**
The map combines different memory places.	4	4
The map preserves individual memory places.	4	3
I can identify the more important places on the map.	5	3
I can identify the less important places on the map.	4	2
I find the map easy to understand.	5	2
I would like to spend more time with the map.	4	2
The map is memorable.	3	4

The stacked bar chart and the median provide a first impression of the distribution and the central tendencies of the collected responses. In order to find out whether the respondent's answers differed significantly between the conventional and the unconventional alternatives, The Wilcoxon Matched Pair Signed-Rank Test was used for hypothesis testing. The null hypothesis (H0) was that there is no significant difference between how the respondents ranked the statements after viewing Map A and Map B. When a significant difference was found, the effect size was calculated to indicate the strength of the found result and the direction of the difference.

The results of the Wilcoxon Matched Pair Signed Rank Test and the effect size are as summarized in the table below. The null hypothesis could not be rejected for the statements "the map combines different memory places" and "the map is memorable" as the p-value for these sentences were lower than 0.05. As a result, no further effect size was calculated. For the remaining sentences, a significant difference was found between how the respondents ranked the statements after viewing Map A and Map B. Effect size for these differences ranged between medium to large and large and all had a negative sign meaning that the rankings for the relevant statements were generally higher for map A than for map B. What these findings mean specifically in the context of this research will be further discussed in the following sections.

Table 6.2 Summary of Wilcoxon Signed-Rank Test results and the relevant effect size for Maps 1A and 1B

	V value	***p-value***	**H0**	**Effect size**	**Interpretation**
The map combines different memory places.	1173	0.5417	Cannot reject: No statistically significant difference.	n/a	n/a
The map preserves individual memory places.	183	< .001	Reject: There is a statistically significant difference.	-0.4760428	Medium to large effect size in favor of Map A.
I can identify the more important places on the map.	329	< .001	Reject: There is a statistically significant difference.	-0.4774851	Medium to large effect size in favor of Map A.
I can identify the less important places on the map.	458	< .001	Reject: There is a statistically significant difference.	-0.4278637	Medium to large effect size in favor of Map A.
I find the map easy to understand.	11.5	< .001	Reject: There is a statistically significant difference.	-0.5887185	Large effect size in favor of Map A.
I would like to spend more time with the map.	465	< .001	Reject: There is a statistically significant difference.	-0.3628446	Medium to large effect size in favor of Map A.
The map is memorable.	1733.5	0.8173	Cannot reject: No statistically significant difference.	n/a	n/a

6.3. Part II: Four Types of Memory Places and the Associated Memories

The chart below visualizes how the respondent's rankings of Map A and Map B (series) are distributed among different Likert scales for each sentence. For most of the statements, Map B (series) appears to be ranked higher than Map A. The exceptions are the statements "I consider the map(s) to be objective" and "I find the map(s) easy to understand."

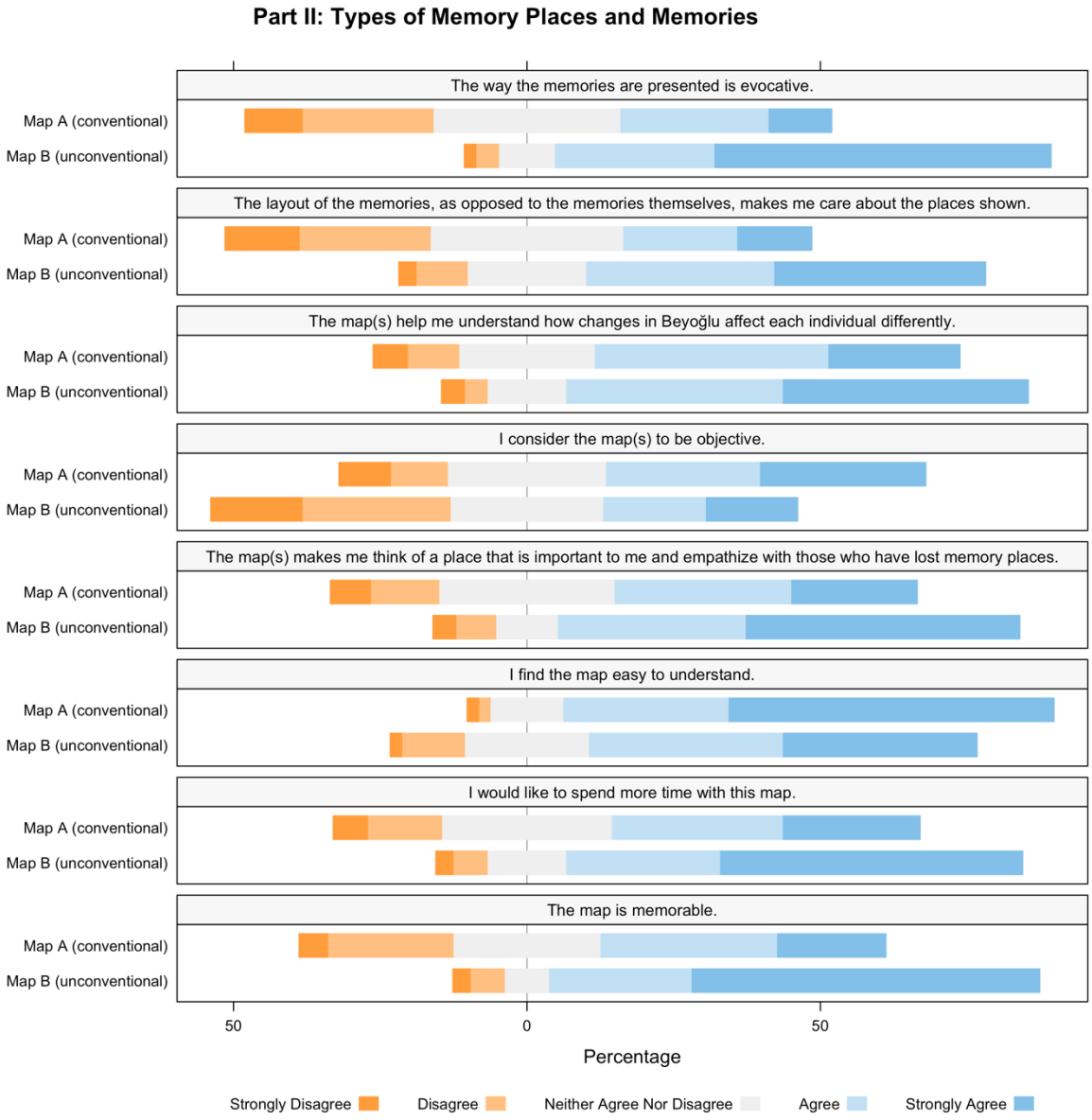

Figure 6.4 Stacked bar chart visualizing how the respondents' ranking of statements about affect and embodiment based on the map type

The table below reports how the median answer differs between the conventional and unconventional visualization techniques. The median answer for Map B (series, unconventional) is higher in most cases. For the statements "I consider the map(s) to be objective" and "I find the map(s) easy to understand," the median answer is higher for Map A, which agrees with what was observed in the stacked bar chart. A new observation is made for the statement "the map(s) help me understand how the changes in Beyoğlu affect each individual differently" as both Map A and Map B have the same median (4 / Agree).

Table 6.3 Median of Likert scale statement rankings for Maps 2A and 2B1–2B4

The Median Answer for Each Statement by Map Type	**Median**	
	Map A	**Map B**
The way the memories are presented is evocative.	3	5
The layout of the memories, as opposed to the memories themselves, makes me care about the places shown.	3	4
The map(s) help me understand how the changes in Beyoğlu affect each individual differently.	4	4
I consider the map(s) to be objective.	4	3
The map(s) makes me think of a place that is important to me and empathize with those who have lost memory places.	3.5	4
I find the map easy to understand.	5	4
I would like to spend more time with the map.	4	4.5
The map is memorable.	3.5	5

The results of the Wilcoxon Matched Pair Signed Rank Test and the effect size are as summarized in the table below. The p-values for all of the sentences were lower than 0.05, meaning that the null hypothesis (H0) could be rejected; there is a statistically significant difference between how the respondents ranked the statements for Map A and Map B (series). Looking at the effect size, it can be seen that these differences were bidirectional. For the statements "I consider the map(s) to be objective" and "I find the map(s) easy to understand," the effect sizes are negative, meaning that the rankings for the relevant statements were generally higher for map A than for map B. For the remaining sentences, the effect sizes were positive and therefore the rankings favored map B. Lastly, the range of the effect sizes varied between small effect size and medium to large effect size.

Table 6.4 Summary of Wilcoxon Signed-Rank Test results and the relevant effect size for Maps 2A and 2B1–2B4

	V value	***p-value***	**H0**	**Effect size**	**Interpretation**
The way the memories are presented is evocative.	339	< .001	Reject: There is a statistically significant difference.	0.4605545	Medium to large effect size in favor of Map B.
The layout of the memories, as opposed to the memories themselves, makes me care about the places shown.	592.5	< .001	Reject: There is a statistically significant difference.	0.3480808	Medium to large effect size in favor of Map B.
The map(s) help me understand how the changes in Beyoğlu affect each individual differently.	440	< .001	Reject: There is a statistically significant difference.	0.2619577	Small effect size in favor of map B.
I consider the map(s) to be objective.	218	< .001	Reject: There is a statistically significant difference.	-0.3123524	Medium to large effect size in favor of Map A.
The map(s) makes me think of a place that is important to me and empathize with those who have lost memory places.	336.5	< .001	Reject: There is a statistically significant difference.	0.3117532	Medium to large effect size in favor of Map B.
I find the map easy to understand.	698.5	< .001	Reject: There is a statistically significant difference.	-0.245473	Small effect size in favor of map A.
I would like to spend more time with the map.	677	< .001	Reject: There is a statistically significant difference.	0.2627868	Small effect size in favor of map B.
The map is memorable.	751	< .001	Reject: There is a statistically significant difference.	0.3329548	Medium to large effect size in favor of Map B.

6.4. Part III: The Content of the Memories

The chart below visualizes how the respondent's rankings of Map A and Map B are distributed among different Likert scales for each sentence. For most of the statements, Map B appears to be ranked higher than Map A. However, a sharp contrast to this pattern is the statement "the map seems official" where the respondents' rankings is overwhelmingly in favor of Map A. The rankings for Map A also appear generally higher for the statement "I find the map(s) easy to understand."

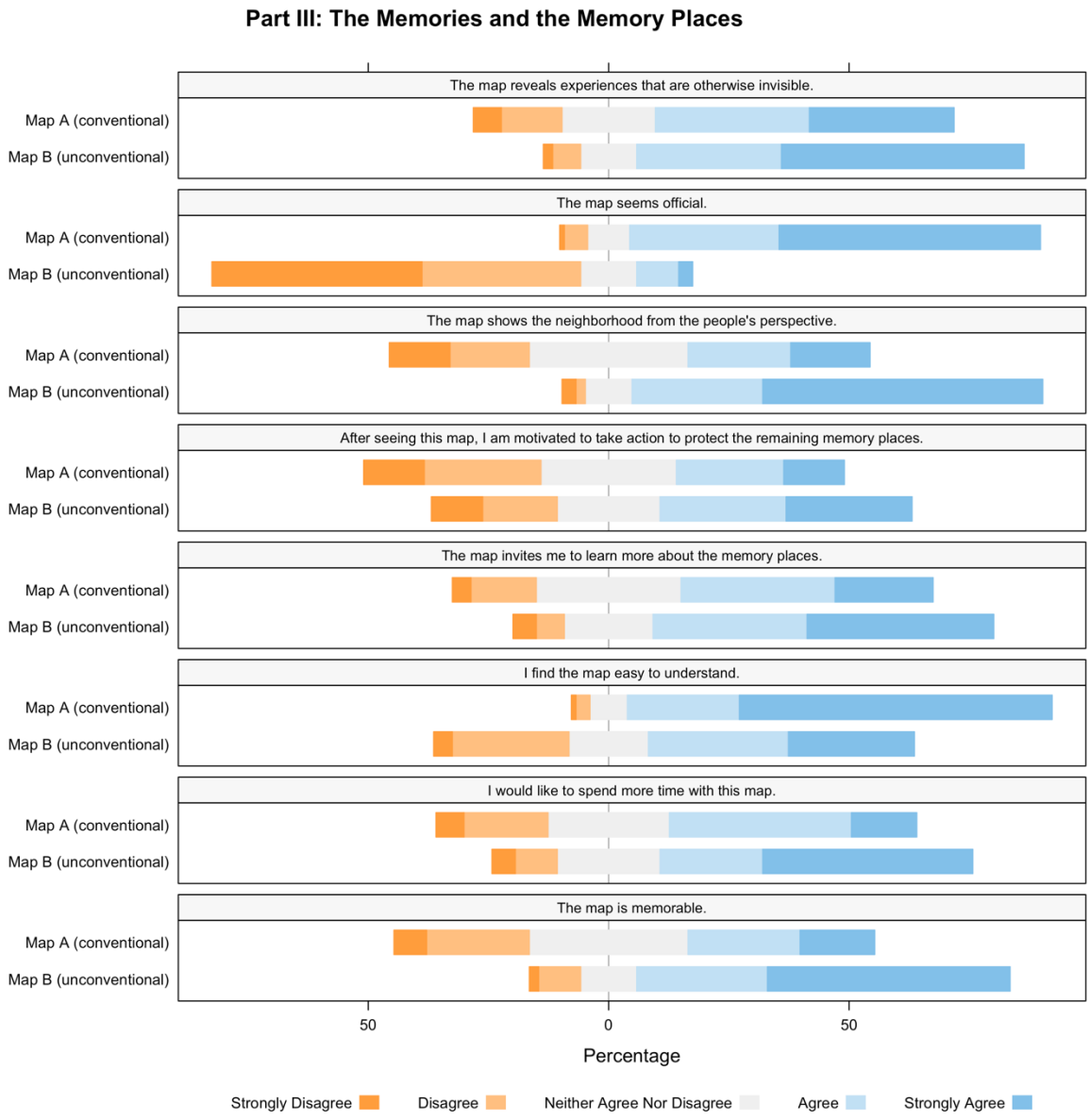

Figure 6.5 Stacked bar chart visualizing how the respondents' ranking of statements about power and empowerment change based on the map type

The table below reports how the median answer differs between the conventional and unconventional visualization techniques. For the statements "the map reveals experiences that are otherwise invisible," "the map shows the neighborhood from the people's perspective," "after seeing this map, I am motivated to take action to protect the remaining memory places," and "the map is memorable," the median answer is higher for Map B (unconventional). For the statements "the map invites me to learn more about the memory places" and "I would like to spend more time with the map," the median answer is the same for both maps (4/ Agree). Finally, for the statements "the map seems official" and "I find this map easy to understand, the median answer is higher for Map A (conventional).

Table 6.5 Median of Likert scale statement rankings for Maps 3A and 3B

The Median Answer for Each Statement by Map Type	**Median**	
	Map A	**Map B**
The map reveals experiences that are otherwise invisible.	4	4.5
The map seems official.	5	2
The map shows the neighborhood from the people's perspective.	3	5
After seeing this map, I am motivated to take action to protect the remaining memory places.	3	4
The map invites me to learn more about the memory places.	4	4
I find the map easy to understand.	5	4
I would like to spend more time with the map.	4	4
The map is memorable.	3	5

The results of the Wilcoxon Matched Pair Signed Rank Test and the effect size are as summarized in the table below. The p-values for all of the sentences were lower than 0.05, meaning that the null hypothesis (H0) could be rejected; there is a statistically significant difference between how the respondents ranked the statements for Map A and Map B. Looking at the effect size, it can be seen that these differences were bidirectional. For the statements "the map seems official" and "I find the map(s) easy to understand," the effect sizes are negative, meaning that the rankings for the relevant statements were generally higher for Map A than for Map B. For the remaining sentences, the effect sizes are positive and therefore, the rankings had favored Map B. Lastly, the range of the effect sizes were the widest so far and ranged between small, medium to large, and large.

Table 6.6 Summary of Wilcoxon Signed-Rank Test results and the relevant effect size for Maps 3A and 3B

	V value	***p-value***	**H (0)**	**Effect size**	**Interpretation**
The map reveals experiences that are otherwise invisible.	428	< .001	Reject: There is a statistically significant difference.	0.2347642	Small effect size in favor of map B.
The map seems official.	38.5	< .001	Reject: There is a statistically significant difference.	-0.594592	Large effect size in favor of map A.
The map shows the neighborhood from the people's perspective.	326	< .001	Reject: There is a statistically significant difference.	0.4430386	Medium to large effect size in favor of Map B.
After seeing this map, I am motivated to take action to protect the remaining memory places.	414	< .001	Reject: There is a statistically significant difference.	0.2332592	Small effect size in favor of map B.
The map invites me to learn more about the memory places.	773	0.00323	Reject: There is a statistically significant difference.	0.2053899	Small effect size in favor of map B.
I find the map easy to understand.	418.5	< .001	Reject: There is a statistically significant difference.	-0.3817121	Medium to large effect size in favor of Map A.
I would like to spend more time with the map.	841.5	0.001067	Reject: There is a statistically significant difference.	0.32748	Small effect size in favor of map B.
The map is memorable.	616.5	< .001	Reject: There is a statistically significant difference.	0.3892717	Medium to large effect size in favor of Map B.

7. SYNTHESIS AND LIMITATIONS

In this section, to answer RQ3.4 and RQ4, I will re-visit the statements that were used in the survey and interpret the results specifically for the purposes of both the Beyoğlu - *I Will Survive* map and counter-mapping at-large.

The first pair of maps (Maps 1A and 1B) visualize the spatial distribution of memory places in Beyoğlu. They aim to convey relative importance of places by highlighting the memory places that were submitted to Beyoğlu - *I Will Survive* project. Map A is a relatively typical depiction of these memory places as point features. Whereas Map B is an unconventional alternative that was created with the feminist principle "embracing pluralism" and uses techniques such as distortions and an open-world assumption.

Following the footsteps of feminist thinkers and theorists (D'Ignazio & Klein, 2020a; Haraway, 1988), pluralism, in this case, is understood as bringing together the voices of people who are directly affected by issues concerning the Beyoğlu neighborhood such that a more specific and truthful representation can exist. As such, communicating a collective sense of place in a pluralistic way was measured in terms of the maps' ability to preserve or combine individual memory places, and embracing pluralism is associated with a collective representation. The results showed that the map users have shown a preference for Map A for preserving individual memory places; however, no significant preference was found for combining memory places. Communicating the relative importance of places is understood as the contrast of the places that are more important to those who have submitted memories about the places and places that are less important that were not mentioned. In terms of the users' ability to identify these places, the users have shown a preference for Map A regarding both more and less important places. These results are summarized in the infographic below (Figure 7.1).

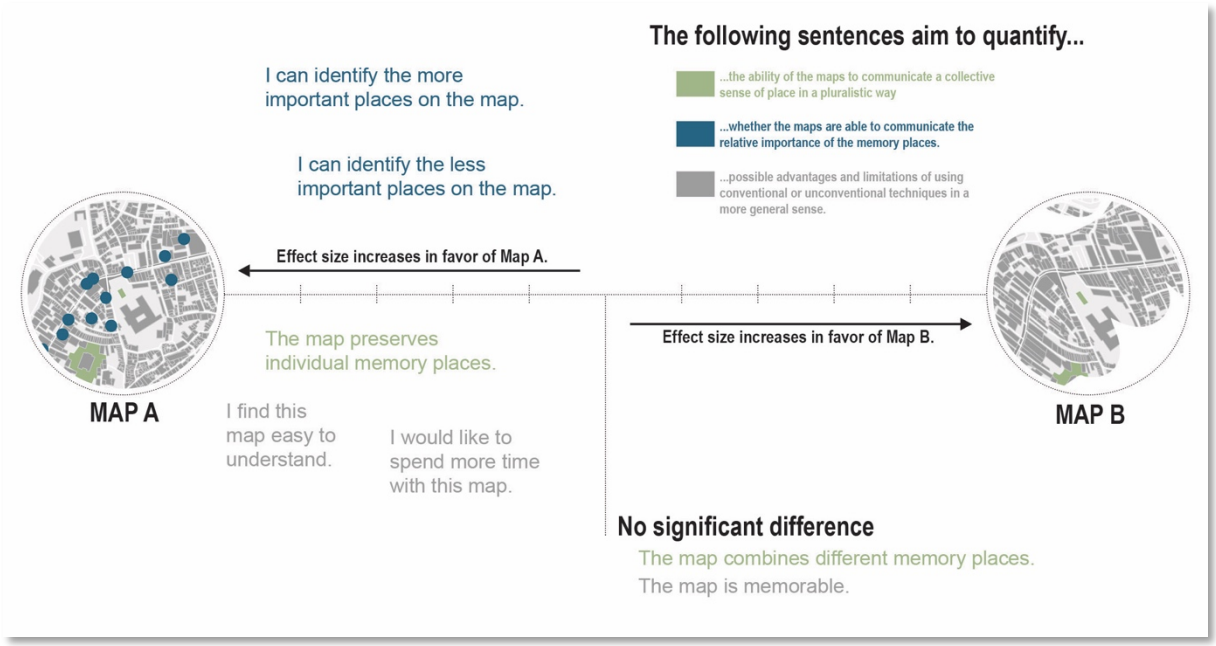

Figure 7.1 Results infographic for Map 1A and 1B

One possible explanation for the overwhelming preference for Map A can be found in statements that were intended to measure the possible advantages and limitations of using conventional or unconventional techniques in a more general sense. The second strongest effect size among all the statements in this study was for the statement "I find this map easy to understand," which favored Map A over Map B. This could be interpreted that Map B, the unconventional alternative to visualizing the spatial distribution of the memory places, was too unfamiliar and abstract for the users to engage with. This limitation does not come as a complete surprise, as cartograms, which distort geography based on a related variable, also suffer from a similar criticism for being difficult to understand, especially when the map users are not familiar with the area that is being mapped (Field, 2017). Additionally, the users also have shown a preference to spend more time with Map A, and no significant difference was found for one map being more memorable than the other.

Regarding the intentions and aims that were set for these maps, neither map was successful in communicating a collective sense of place in a pluralistic way. Although Map A was more successful in communicating the more important places on the map, as depicted on the infographic above, it was also nearly as successful in communicating the less important places on the map. Therefore, its capability to visualize the relative importance of places could be further scrutinized and improved. Although the distortion and the open world assumption used in Map B did not meet their intended goals, future research could investigate whether the use of these methods in combination with other visualization techniques could better communicate a collective sense of place in a pluralistic way. A general take away for counter-mapping is that although unconventional methods can be tempting to use for their novelties, it is important that they remain understandable and engaging.

The second pair of maps (Maps 2A and 2B1–2B4) visualize the four types of memory places and the associated memories. They aim to communicate the emotional aspects of memory places and individuality of each memory that was submitted along. Map A is a relatively typical depiction that uses color to distinguish memory places and call-outs that lead to text boxes with associated memories. Map B1–B4 are a part of a series that were created with the feminist principle "elevate emotion and embodiment" and experiment with the integration of text into the map, shapes, and composition of the map elements based on the memories.

The feminist principle "elevate emotion and embodiment" in this case is understood as rejecting a singularly "objective" depiction of the neighborhood and presenting memories in a way that the map user can relate to the emotions associated with the changes in the neighborhood and how these might be different for each memory, and therefore each individual. The maps' ability to highlight individual experiences over a seemingly objective depiction is measured in literal terms and are shown in the infographic below along with the other statements (Figure 7.2). The results reveal that the users had a preference for Map A, considering it to be more objective, whereas Map B was generally ranked higher to help the users understand how the changes in Beyoğlu affected each individual differently. Elevating emotional aspects of the memories were measured in terms of triggering empathetic and emotional responses. Furthermore, a statement specifically tested the layout and whether it had an impact on the users' emotional reactions. In all regards, Map B had a generally higher ranking.

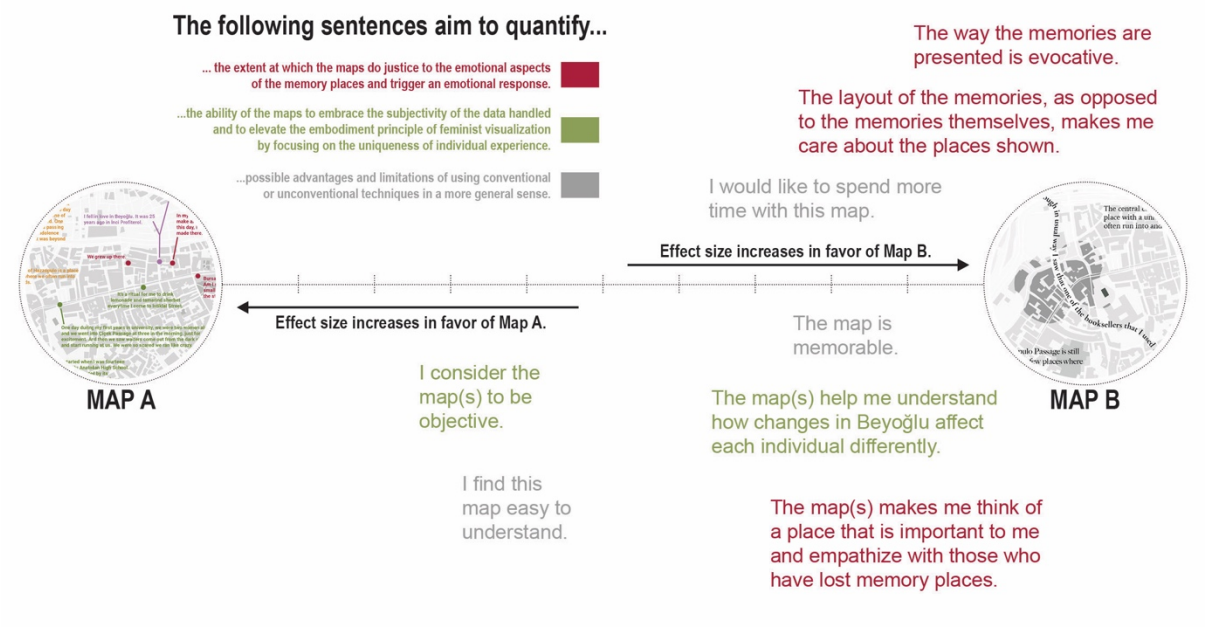

Figure 7.2 Results infographic for Map 2A and 2B (series)

For the general statements that were repeated in each section, the users had ranked Map B higher for being more memorable, however, Map A was preferred for being easily understood. Map B was also preferred for wanting to spend more time with. In the specific context of Beyoğlu - *I Will Survive* map, Map B was considered a stronger alternative as it performs better for the purpose of elevating emotion and embodiment. However, it still had some shortcomings. It was not considered as objective as the conventional map. While objectivity is not the main concern when it comes to depicting memories and associated emotions, for the broader context of counter-mapping, it is still an important characteristic to consider, especially in the cases when maps also act as legal evidence (Wood, 2010, p. 140). Similarly, while being easily understood was not a priority for the Beyoğlu Map, it could be disadvantageous if it was too abstract and illegible for those who lacked the time, resources, and ability to engage with the map.

The third and the last pair of maps (Maps 3A and 3B) visualize the content of the memories that were submitted. These maps intend to reclaim and overwrite the dominant and top-down representations of the neighborhood by centering people's experiences. Map A is a conventional map where points on the map are matched to the full text of the memories with a numbering system. Map B is an unconventional alternative that uses sketches that are drawn with visual symbols and keywords inspired by the memories. Map B is also created with the feminist principle of "challenge power" and aspire to empowerment and it adopted a sketch-like, DIY appearance that is common to counter-maps that are produced through participatory methods.

The feminist principle "challenge power" in this case is understood as challenging the mapping techniques and aesthetics that are typically used by those in power and mapping in an accessible way without needing technical expertise. Aspiring to empowerment is thought in terms of the map user's willingness to take action, whether that may be educating themselves at a personal level or joining a movement. The maps' ability to challenge power is measured through whether it looks official or whether it is able to render experiences visible by highlighting people's perspectives. While the users ranked Map A higher for appearing official and thereby supporting the status-quo, they ranked Map B higher for showing the

neighborhood from the people's perspectives. The map users also preferred map B when they were asked whether they are encouraged to learn more about the memory places or take an action to protect them.

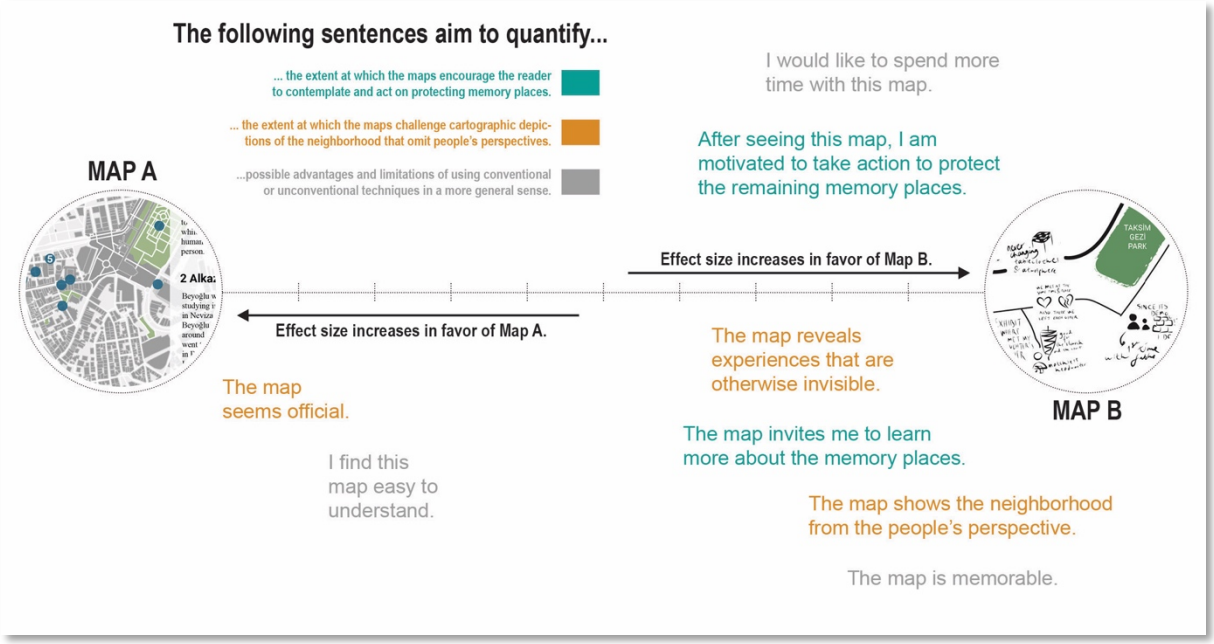

Figure 7.3 Results infographic for Map 3A and 3B

For the general statements that were repeated in each section, Map A was preferred for being easily understood, continuing the pattern from the previous sections. It is important to mention that in this section this preference could partly be attributed to the technical limitations of the survey. Map B was rich in detail and required more technical abilities, such as zooming and panning, in order to navigate and appreciate it. In other aspects, the users had ranked Map B higher for being more memorable and also preferred it for wanting to spend more time with it. Similar to the previous section, there is an opportunity cost between the unconventional map meeting the aims with which it was created and having the qualities of being official and easily understood. While being easy to understand is important for all maps, this research raises the following question: is it more important for a counter-map to be easily understood or is it more important that it motivates people to take action? In the case of the Beyoğlu map, the answer is to motivate people to take action, and therefore, Map B is a better choice overall. However, in the greater context of counter-maps, a possibility to explore is whether a counter-map can be both of those things.

Limitations

While this study adopted a scientific and systematic approach to answering the research question, there are nonetheless several limitations which are discussed below.

First, this study investigated the population as a whole, but there is much more to be asked whether the findings from the study remain true for different target audiences. As known from the user studies results, the respondents had various degrees of cartographic knowledge and familiarity with the Beyoğlu neighborhood and the changes it has been going through (Figures 6.1 and 6.2). While outside of the scope of this research, it would be valuable to know whether there is a difference between how these population groups ranked the maps and whether there was a significant difference between them.

Second, while I described maps as unconventional and unconventional based on the literature, this also highly depends on the respondent's previous encounters of having interacted with a similar map. This distinguishment of the conventional and the unconventional in this thesis posits an arbitrary binary that might not be truthful to each individual's experiences. To account for this variation in individual experiences, a strategy could have been to ask and incorporate into the analysis is how conventional and unconventional the participants considered each map.

Third, even though as the author of this thesis, I have had continuous contact with the organization Center for Spatial Justice, I have neither been involved with the collection of the memories, nor have had interacted with the individuals who have contributed their memories to the project. The maps were created through a rather individualistic approach and many decisions were taken by me as the cartographer. An interesting question to ponder is whether these maps would look different if they were created together with the people who have contributed to the project at different stages.

Finally, a thesis on feminist visualization principles could not go without a reflexivity statement. I am from Turkey and if I were to take the questionnaire myself, I would rank my personal knowledge of the neighborhood at "expert level." However, I have not visited this neighborhood in over 5 years and therefore, my knowledge of the changes it is going through is limited and comes mainly through other people's stories and published media. Any ignorance and negligence in describing the extent or the gravity of the issue in a just manner should be attributed to my positionality as the author of this thesis.

8. CONCLUSION AND OUTLOOK

The overarching objective of this research was to adapt and document a workflow on how to create a critical and content-driven visualization of marginalized narratives, as well as to assess the effectiveness of the unconventional visualization techniques that come out of this process. This was adapted to the specific case of Beyoğlu, a neighborhood in Istanbul, Turkey, where a mapping project was initiated by the Cent for Spatial Justice to highlight and protect memory places that give the neighborhood its character.

The first research objective (RO1) was to raise a better understanding of counter-maps and the visualization techniques they employ. This was accomplished by studying a collection of counter-maps from around the world and identifying the characteristics and needs of these maps, which ultimately defined the visualization techniques they employed. It was found that depending on the relationship between the mapmaker and the mapped, as well as the intended purposes and target audience, counter-maps may resort to more traditional visualization techniques or dabble in cartographic exploration. In addition to creating a sample inventory of counter-maps existing at the time of writing this thesis, this research objective was a crucial segue for reimagining Beyoğlu - *I Will Survive* map. Through accomplishing this objective, the priorities for Beyoğlu - *I Will Survive* map were identified and visualization techniques were selected in the next steps accordingly.

The second research objective (RO2) was to apply and develop content-driven place-based visualization techniques rooted in feminist visualization principles for the Beyoğlu - *I Will Survive* map and to document this process. This was accomplished by developing two different kinds of visualizations and comparing them. One was conventional visualization techniques rooted in established cartographic language and common practices; the other was unconventional visualization techniques driven by feminist visualization principles and inspired by existing counter-mapping practices. The considerations of what was considered conventional or unconventional were deliberated in the previous sections.

Lastly, the third research objective (RO3) was to present limitations and possibilities of unconventional and content-driven visualization techniques in the case of Beyoğlu - *I Will Survive* map, for counter-mapping in general and beyond. This objective was accomplished by a user study that consisted of an online questionnaire. The findings from this questionnaire were contextualized by synthesizing them with previous findings of the needs and characteristics of counter-mapping in general, as well as the needs and characteristics of Beyoğlu - *I Will Survive* map.

To summarise the findings, counter-maps are highly diverse in nature and are created for specific purposes that come out of specific contexts. As such, a variety of techniques and approaches already exist within the body of literature. The intention of this research was not to propose a universal solution for all counter-mapping purposes, but rather to document, display, and evaluate visualizations created for one particular case. This particular case was to reclaim place through marginalized narratives in Beyoğlu, Istanbul. However, many findings from this case can be relevant for several other contexts. First of all, the visualization techniques discussed and evaluated in this research can be most directly applied to neighborhoods from around the world that are facing similar challenges and encourage counter-mapping initiatives. Second, while this research focused on visualization of place, the visualization techniques studied can be used to map other text-based data such as oral histories, interviews, as well as fictional and

cinematic narratives. Finally, the development and use of unconventional visualization techniques is a discussion relevant to the cartographic discipline as more diverse needs and new types of data arise.

This thesis concludes with the overall finding that when maps are designed with feminist principles, a necessary condition is to innovate visualization techniques, because the cleanest, easiest, the most aesthetically pleasing option is not always the best option to achieve the intended aims. Inspiration for such visualization techniques can be found from existing counter-maps developed for similar purposes. Unconventional maps can be effective, however, when they employ techniques that are not familiar; they are not always easy to understand and interact with. When counter-mapping, it is necessary that goals and priorities are set from the beginning with the context and the use case in mind. A recommendation going forward is to either use unconventional methods that have been previously tested, like those used in this study, or undertake a pre-test to assure that the needs and intentions of the case are met.

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APPENDIX A. FULL SIZE MAPS

Figure 8.1 Large Map 1A - Spatial distribution of memory places

Figure 8.2 Large Map 1B - Spatial distribution of memory places

Figure 8.3 Large Map 2A - Types of memory places and memories

Figure 8.4 Large Map 2B1 - Sample surviving memory place

Figure 8.5 Large Map 2B2 - Sample transformed memory place

Figure 8.6 Large Map 2B3 - Sample moved memory place

Figure 8.7 Large Map 2B4 - Sample closed memory place

Figure 8.8 Large Map 3A - Content of the memories in text

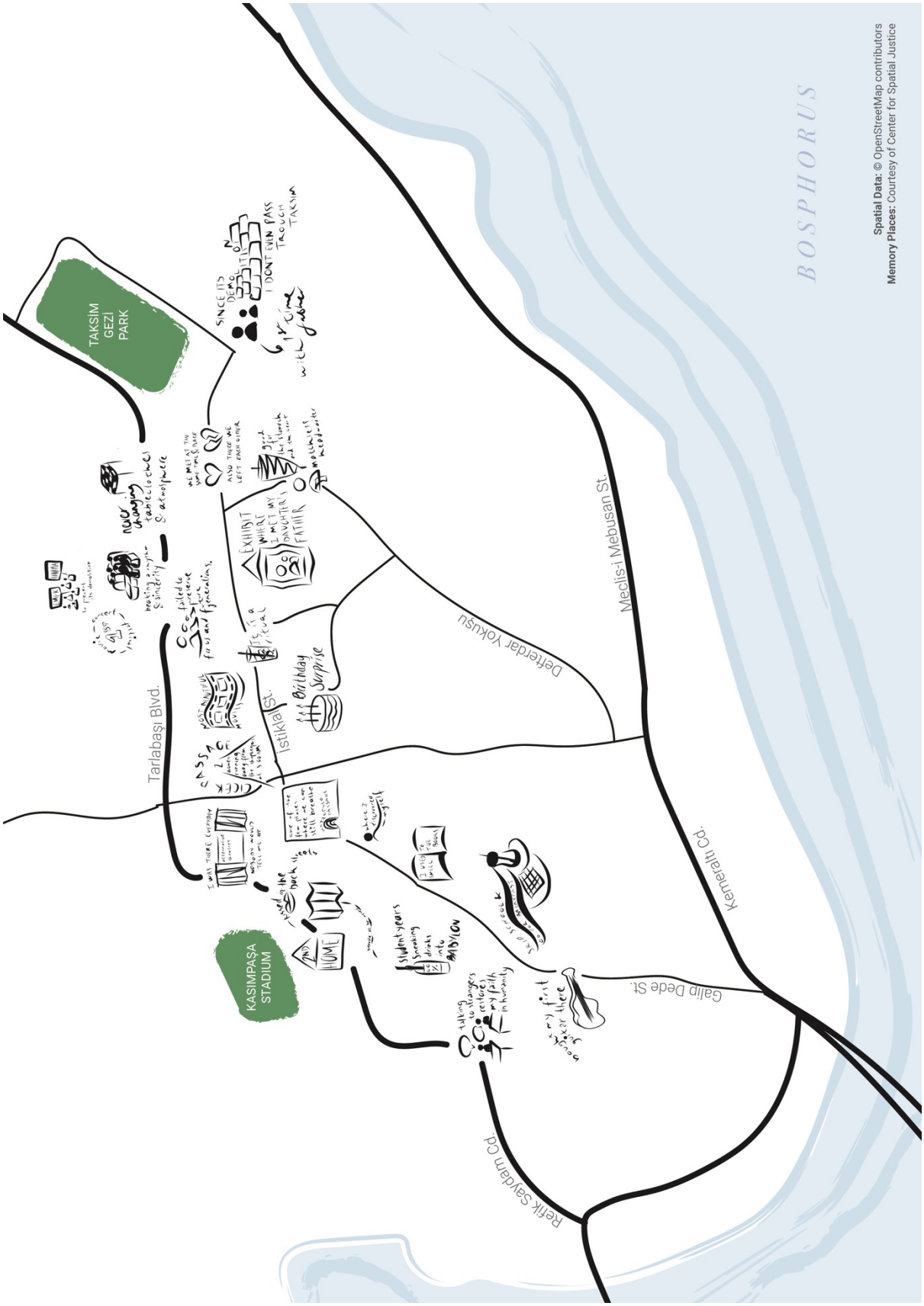
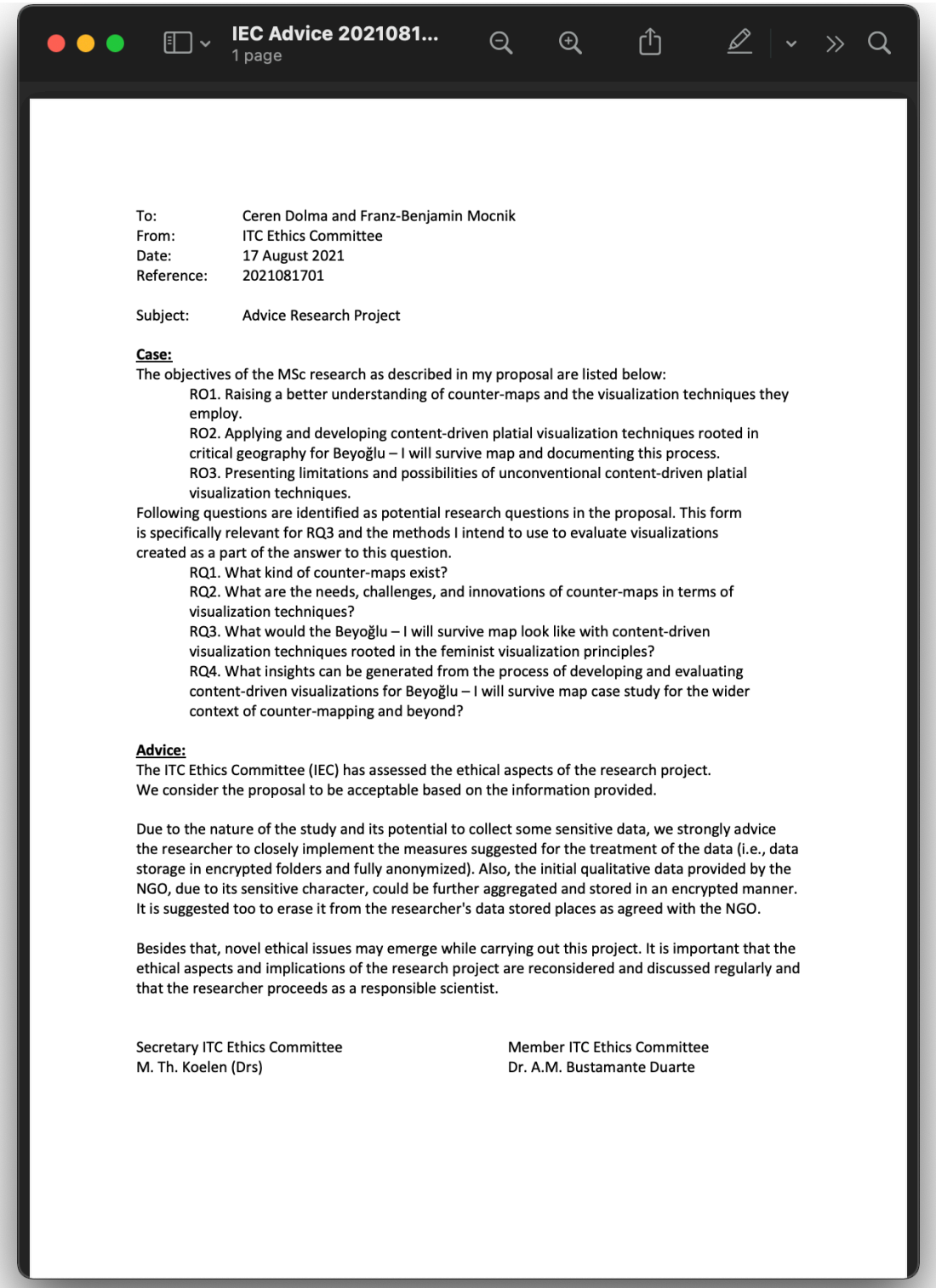


Figure 8.9 Large Map 3B - Content of the memories in sketches

APPENDIX B. ITC ETHICS COMMITTEE APPROVAL AND RECOMMENDATIONS



IEC Advice 2021081...
1 page

To: Ceren Dolma and Franz-Benjamin Mocnik
From: ITC Ethics Committee
Date: 17 August 2021
Reference: 2021081701

Subject: Advice Research Project

Case:
The objectives of the MSc research as described in my proposal are listed below:

RO1. Raising a better understanding of counter-maps and the visualization techniques they employ.
RO2. Applying and developing content-driven platial visualization techniques rooted in critical geography for Beyoğlu – I will survive map and documenting this process.
RO3. Presenting limitations and possibilities of unconventional content-driven platial visualization techniques.

Following questions are identified as potential research questions in the proposal. This form is specifically relevant for RQ3 and the methods I intend to use to evaluate visualizations created as a part of the answer to this question.

RQ1. What kind of counter-maps exist?
RQ2. What are the needs, challenges, and innovations of counter-maps in terms of visualization techniques?
RQ3. What would the Beyoğlu – I will survive map look like with content-driven visualization techniques rooted in the feminist visualization principles?
RQ4. What insights can be generated from the process of developing and evaluating content-driven visualizations for Beyoğlu – I will survive map case study for the wider context of counter-mapping and beyond?

Advice:
The ITC Ethics Committee (IEC) has assessed the ethical aspects of the research project.
We consider the proposal to be acceptable based on the information provided.

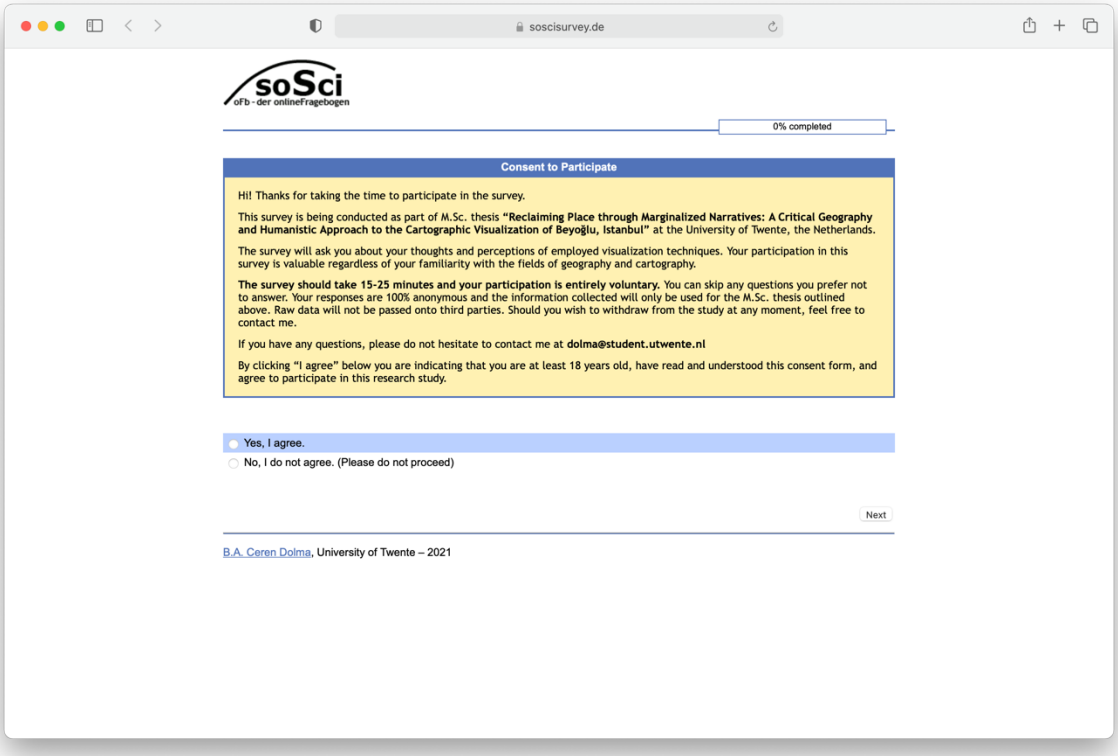
Due to the nature of the study and its potential to collect some sensitive data, we strongly advice the researcher to closely implement the measures suggested for the treatment of the data (i.e., data storage in encrypted folders and fully anonymized). Also, the initial qualitative data provided by the NGO, due to its sensitive character, could be further aggregated and stored in an encrypted manner. It is suggested too to erase it from the researcher's data stored places as agreed with the NGO.

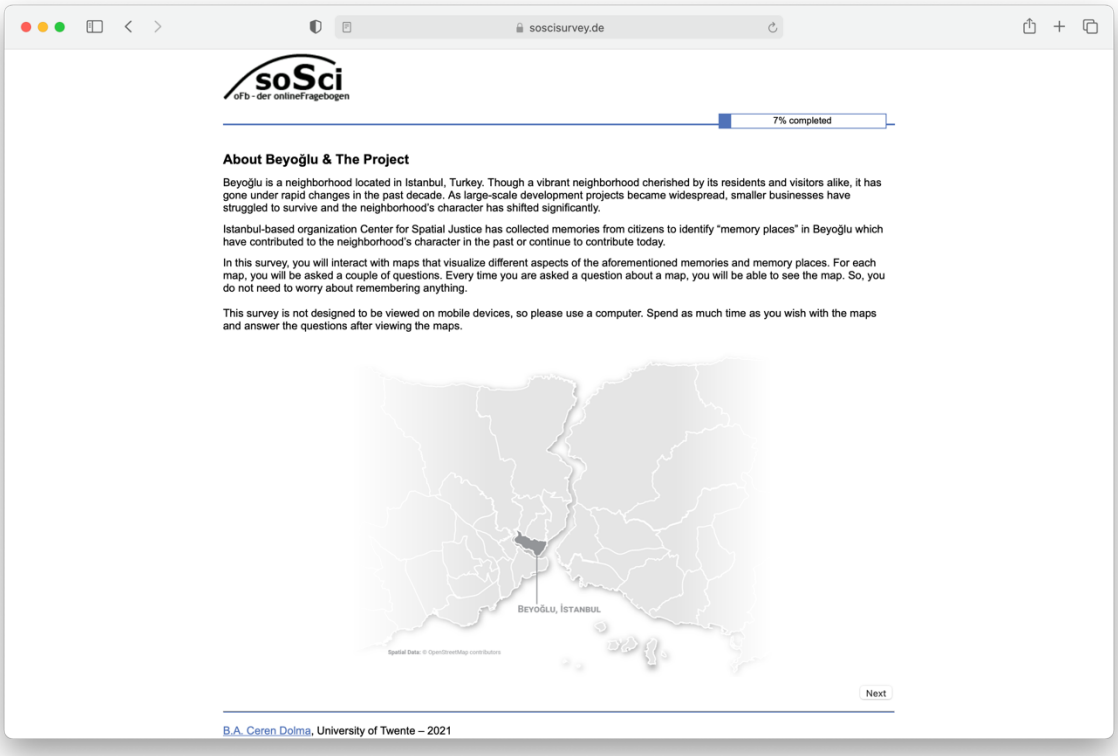
Besides that, novel ethical issues may emerge while carrying out this project. It is important that the ethical aspects and implications of the research project are reconsidered and discussed regularly and that the researcher proceeds as a responsible scientist.

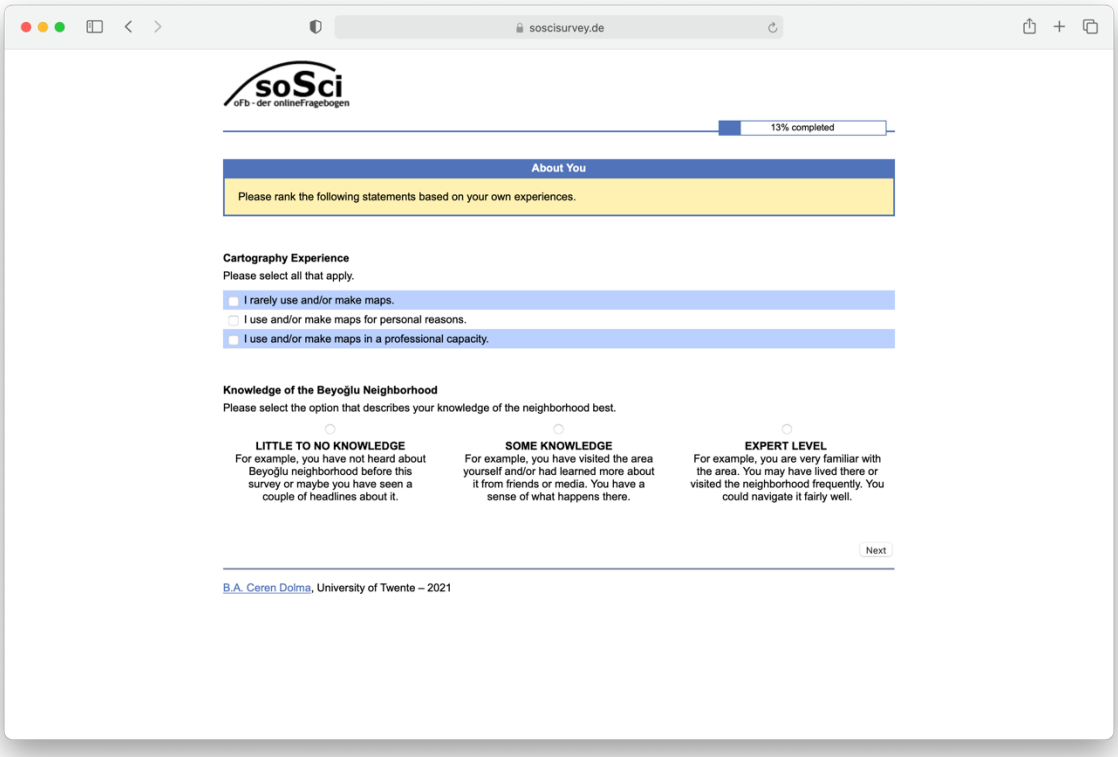
Secretary ITC Ethics Committee
M. Th. Koelen (Drs)

Member ITC Ethics Committee
Dr. A.M. Bustamante Duarte

APPENDIX C. QUESTIONNAIRE SCREENSHOTS



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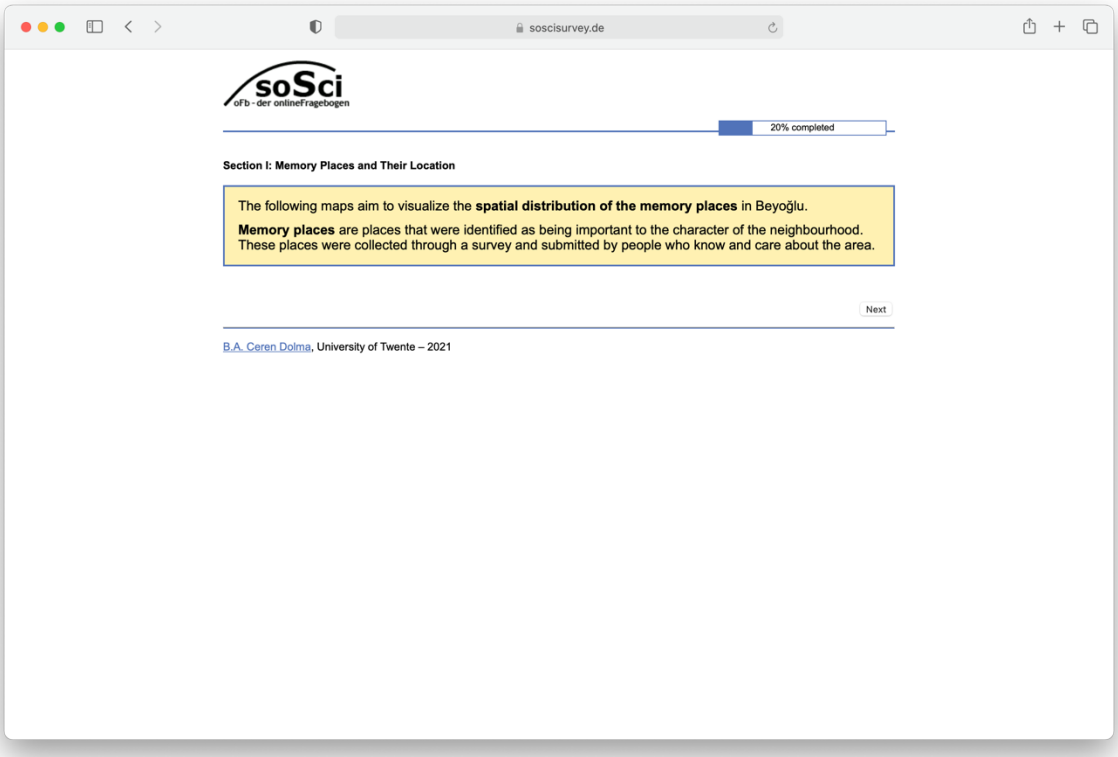
oFb - der onlineFragebogen
13% completed
About You
Please rank the following statements based on your own experiences.
Cartography Experience
Please select all that apply.
I rarely use and/or make maps.
I use and/or make maps for personal reasons.
I use and/or make maps in a professional capacity.
Knowledge of the Beyoğlu Neighborhood
Please select the option that describes your knowledge of the neighborhood best.
LITTLE TO NO KNOWLEDGE
For example, you have not heard about Beyoğlu neighborhood before this survey or maybe you have seen a couple of headlines about it.
SOME KNOWLEDGE
For example, you have visited the area yourself and/or had learned more about it from friends or media. You have a sense of what happens there.
EXPERT LEVEL
For example, you are very familiar with the area. You may have lived there or visited the neighborhood frequently. You could navigate it fairly well.
Next
B.A. Ceren Dolma, University of Twente – 2021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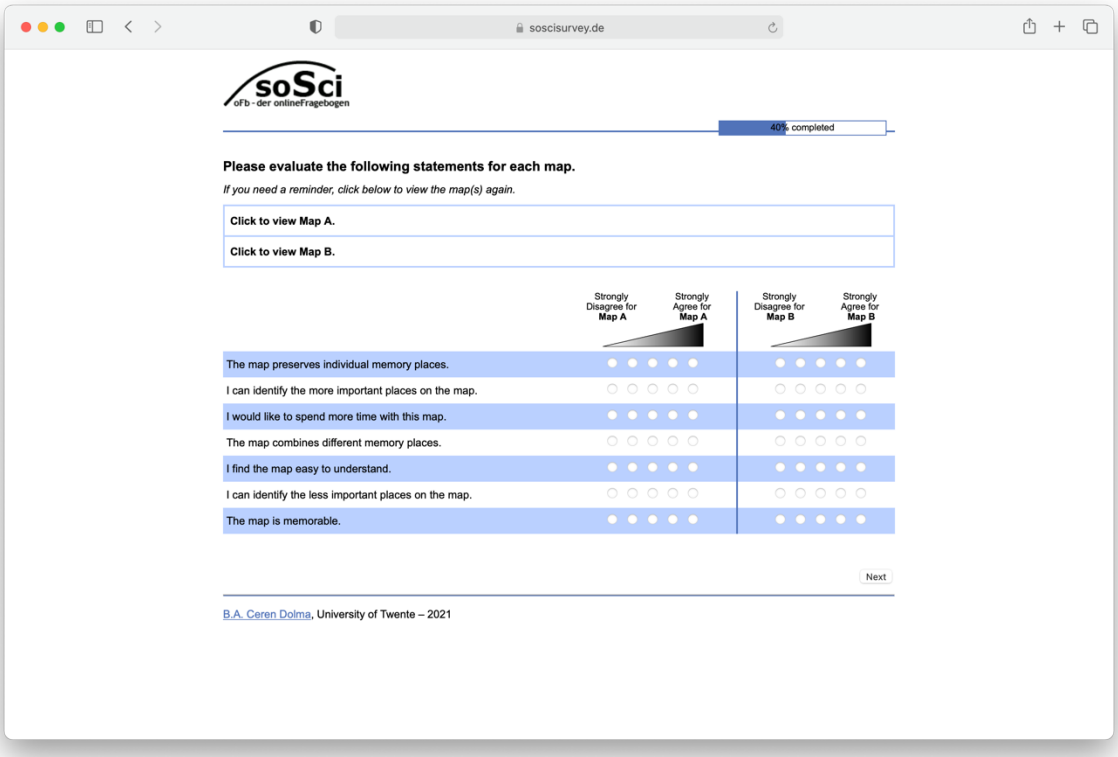
oFb - der onlineFragebogen
20% completed
Section I: Memory Places and Their Location
The following maps aim to visualize the spatial distribution of the memory places in Beyoğlu.
Memory places are places that were identified as being important to the character of the neighbourhood. These places were collected through a survey and submitted by people who know and care about the area.
Next
B.A. Ceren Dolma, University of Twente – 2021


soscisurvey.de
27% completed
This map shows the approximate location of each memory place overlayed onto the map of Beyoğlu.
You are encouraged to zoom in and explore.
MAP A
Next
B.A. Ceren Dolma, University of Twente – 2021


soscisurvey.de
33% completed
This map shows parts of Beyoğlu that were mentioned in the memories while excluding parts that were not. It is also distorted to exaggerate the visible areas.
You are encouraged to zoom in and explore.
MAP B
Next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oFb - der onlineFragebogen
40% completed
Please evaluate the following statements for each map.
If you need a reminder, click below to view the map(s) again.
Click to view Map A.
Click to view Map B.
Strongly Disagree for Map A
Strongly Agree for Map A
Strongly Disagree for Map B
Strongly Agree for Map B
The map preserves individual memory places.
I can identify the more important places on the map.
I would like to spend more time with this map.
The map combines different memory places.
I find the map easy to understand.
I can identify the less important places on the map.
The map is memorable.
Next
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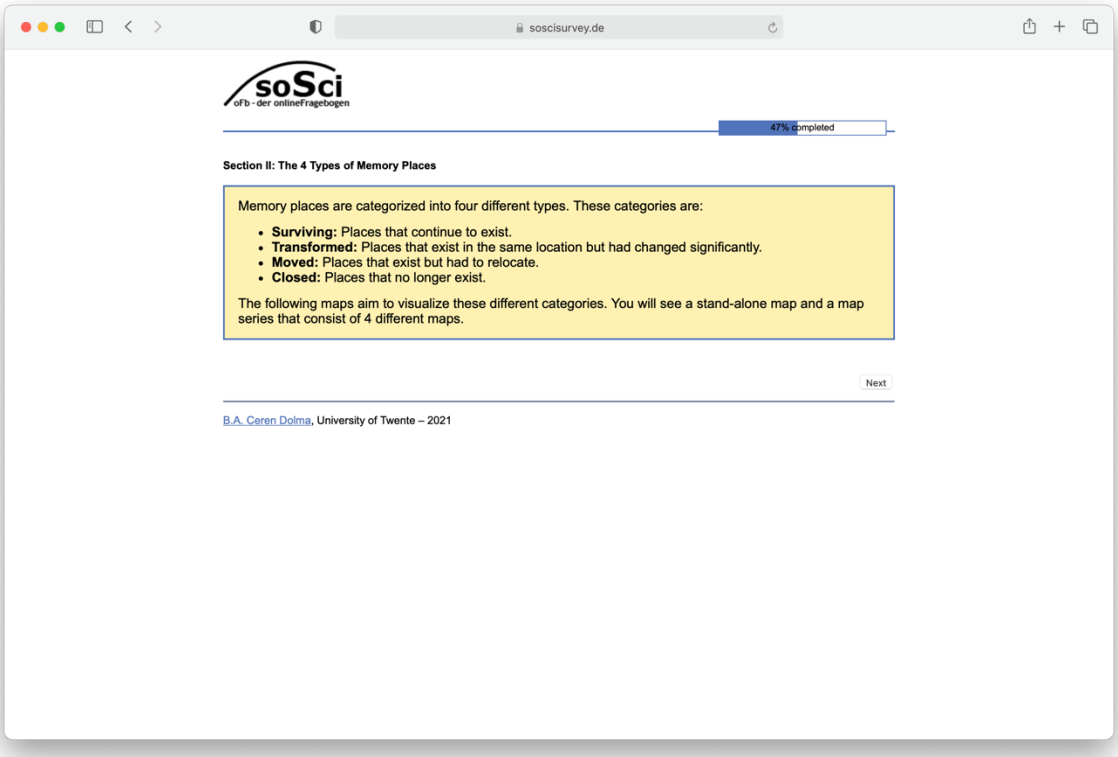
Click to view Map A.
Click to view Map B.
Strongly Disagree for Map A
Strongly Agree for Map A
Strongly Disagree for Map B
Strongly Agree for Map B
The map preserves individual memory places.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47% completed
Section II: The 4 Types of Memory Places
Memory places are categorized into four different types. These categories are:
Surviving: Places that continue to exist.
Transformed: Places that exist in the same location but had changed significantly.
Moved: Places that exist but had to relocate.
Closed: Places that no longer exist.
The following maps aim to visualize these different categories. You will see a stand-alone map and a map series that consist of 4 different maps.
Next
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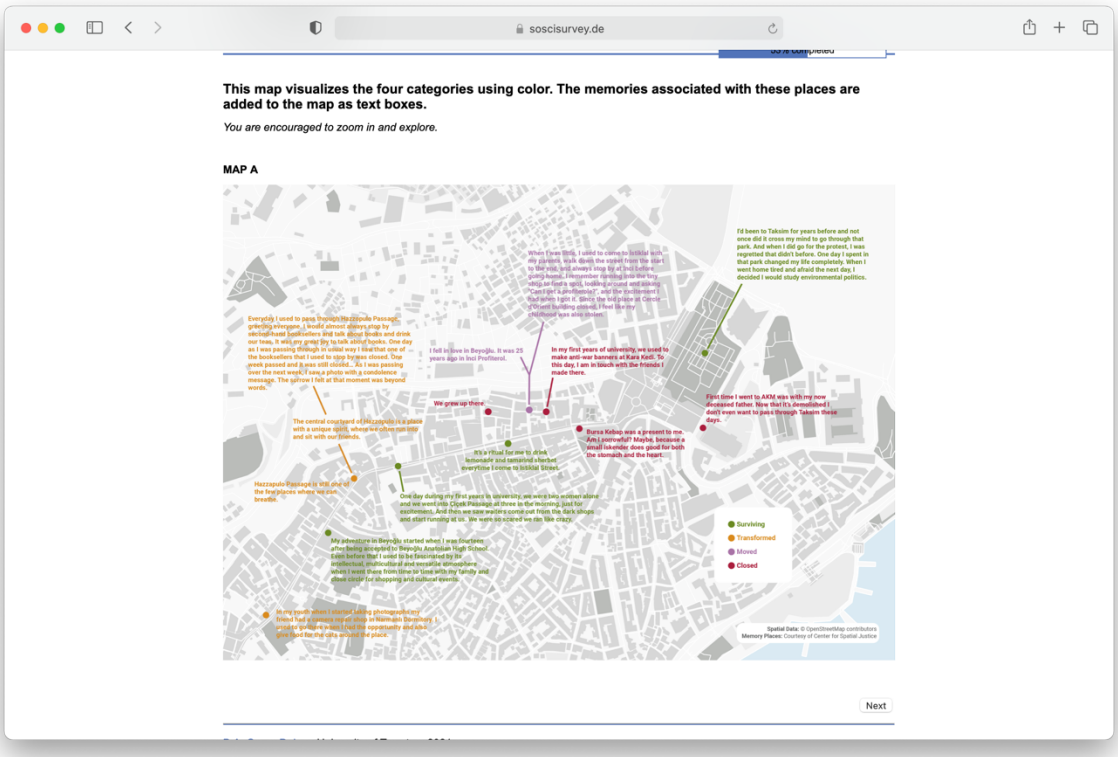
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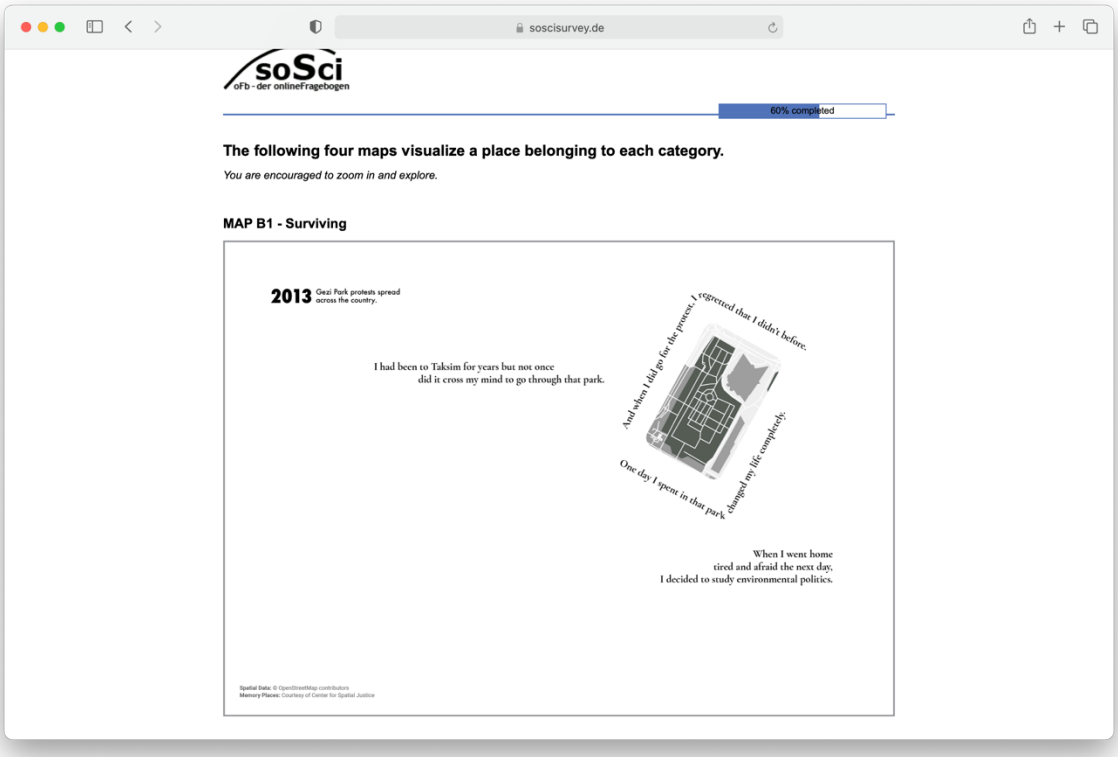
This map visualizes the four categories using color. The memories associated with these places are added to the map as text boxes.
You are encouraged to zoom in and explore.
MAP A
Surviving
Transformed
Moved
Closed
Next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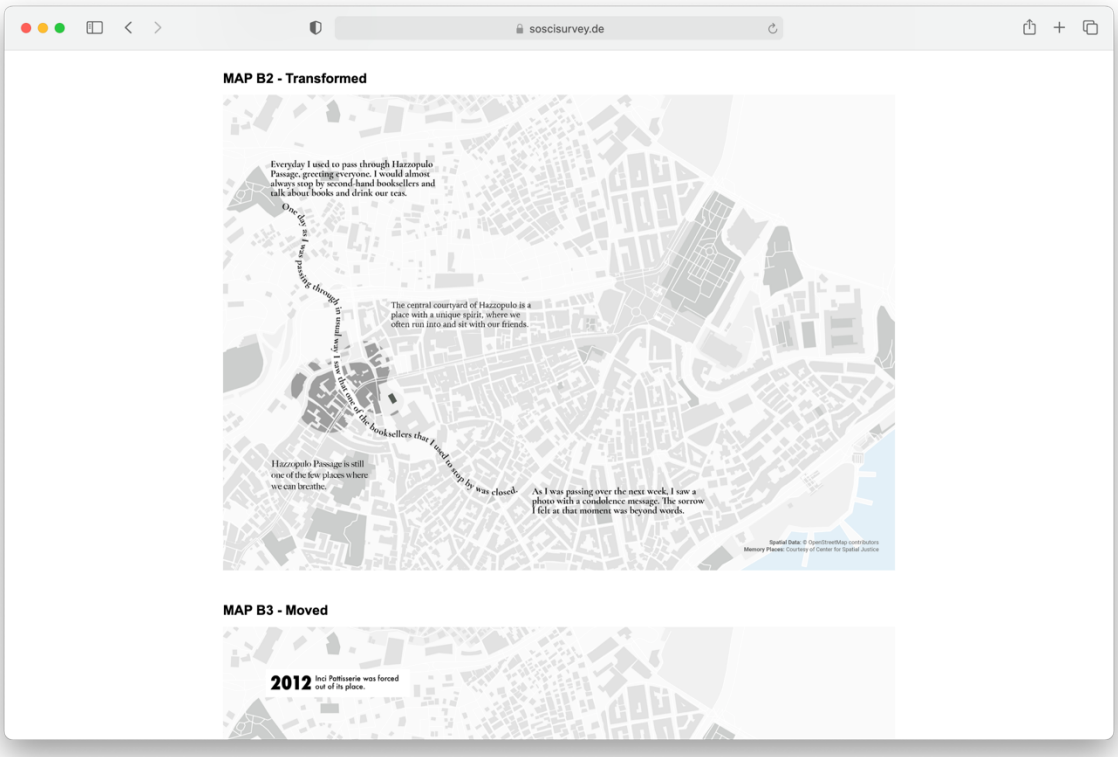
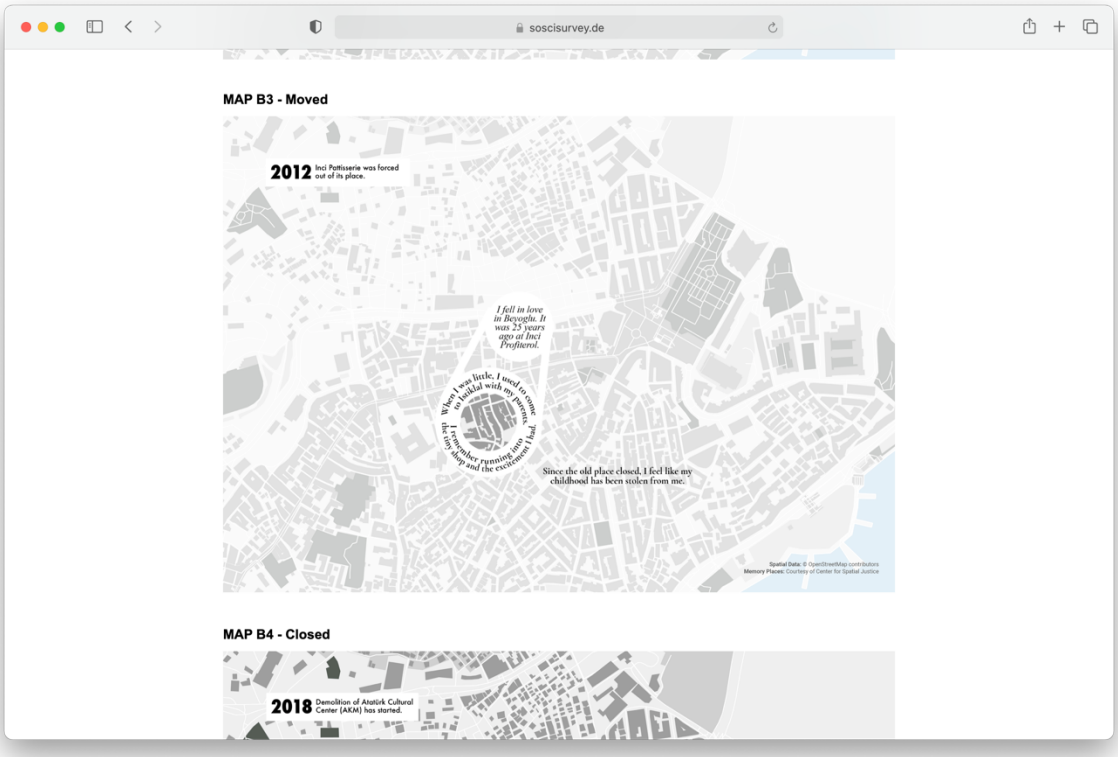
60% completed
The following four maps visualize a place belonging to each category.
You are encouraged to zoom in and explore.
MAP B1 - Surviving
2013 Gezi Park protests spread across the country.
I had been to Taksim for years but not once did it cross my mind to go through that park.
And when I did go for the protest, I regretted that I didn't before.
One day I spent in that park changed my life completely.
When I went home tired and afraid the next day, I decided to study environmental politics.


soscisurvey.de
MAP B2 - Transformed
Everyday I used to pass through Harzopulo Passage, greeting everyone. I would almost always stop by second-hand booksellers and talk about books and drink our teas.
One day as I was passing through in usual way, I saw that one of the booksellers that I used to stop by was closed.
The central courtyard of Hazzopulo is a place with a unique spirit, where we often run into and sit with our friends.
Hazzopulo Passage is still one of the few places where we can breathe.
As I was passing over the next week, I saw a photo with a condolence message. The sorrow I felt at that moment was beyond words.
MAP B3 - Moved
2012 Inci Pattisserie was forced out of its place.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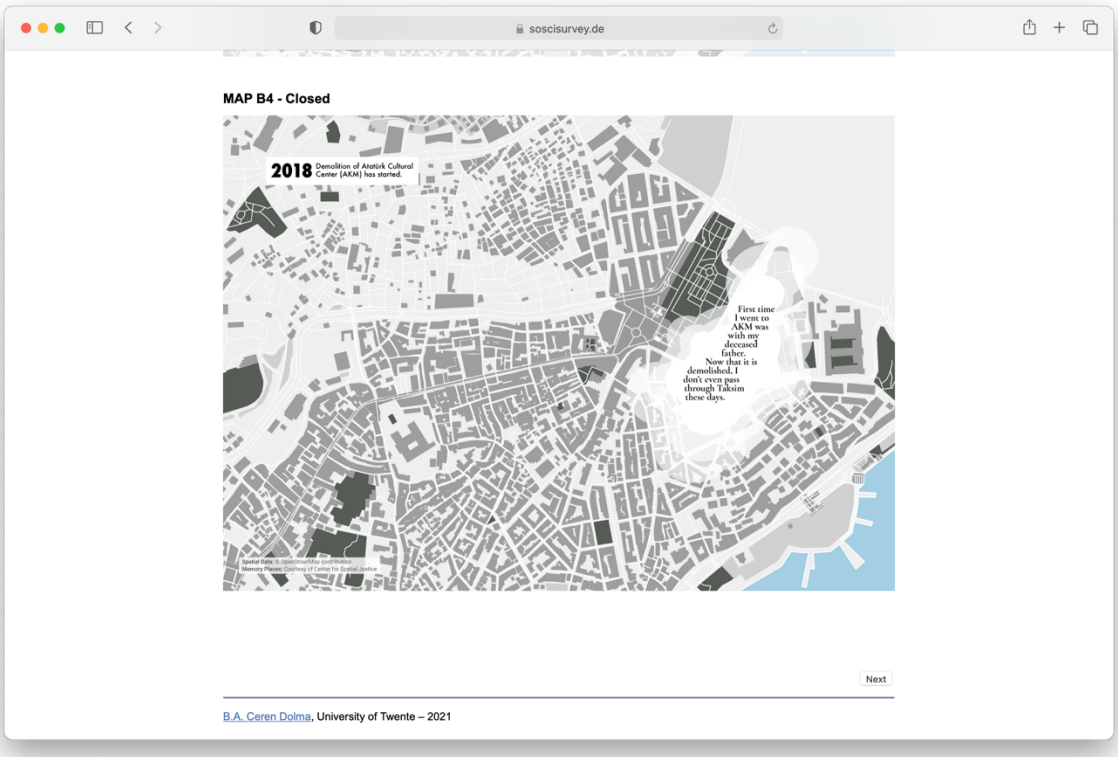
MAP B3 - Moved
2012 Inci Pottiserie was forced out of its place.
I fell in love in Beyoglu. It was 25 years ago at Inci Profiterol.
When I was little, I used to come to Istiklal with my parents. I remember running into the crowd, along and the excitement I had.
Since the old place closed, I feel like my childhood has been stolen from me.
MAP B4 - Closed
2018 Demolition of Atatürk Cultural Center (AKM) has started.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MAP B4 - Closed
2018 Demolition of Atatürk Cultural Center (AKM) has started.
First time I went to AKM was with my deceased father. Now that it is demolished, I don't even pass through Taksim these days.
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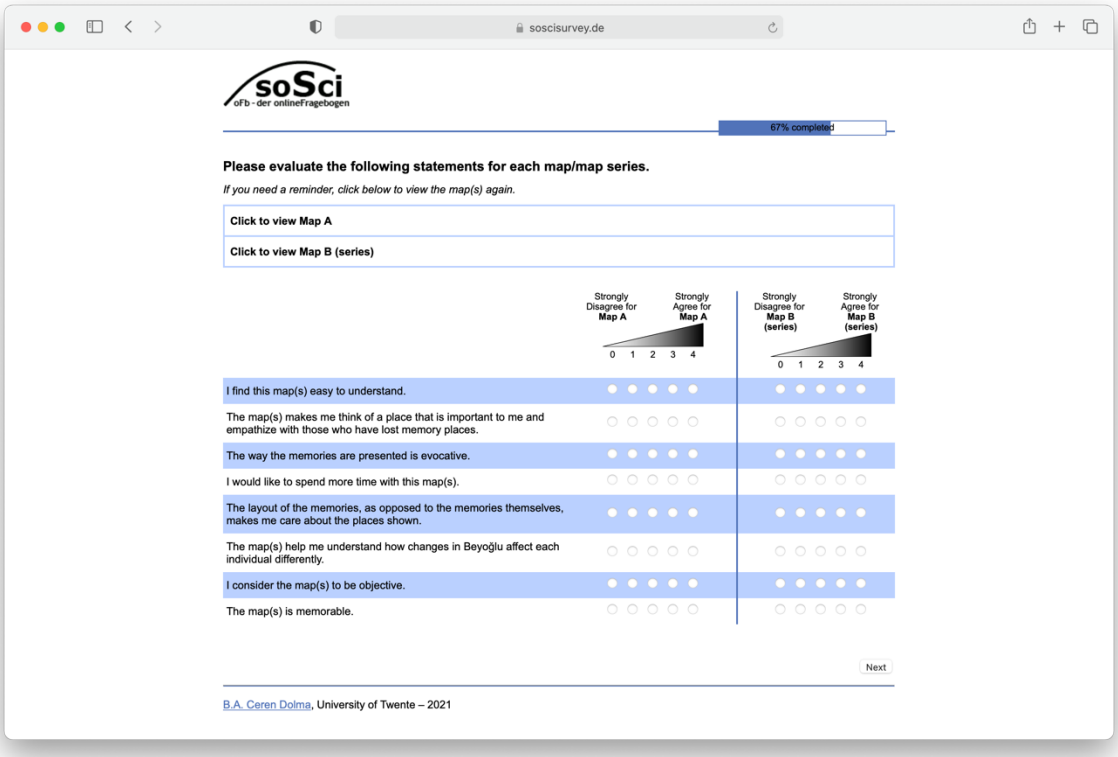
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67% completed
Please evaluate the following statements for each map/map series.
If you need a reminder, click below to view the map(s) again.
Click to view Map A
Click to view Map B (series)
Strongly Disagree for Map A
Strongly Agree for Map A
0 1 2 3 4
Strongly Disagree for Map B (series)
Strongly Agree for Map B (series)
0 1 2 3 4
I find this map(s) easy to understand.
The map(s) makes me think of a place that is important to me and empathize with those who have lost memory places.
The way the memories are presented is evocative.
I would like to spend more time with this map(s).
The layout of the memories, as opposed to the memories themselves, makes me care about the places shown.
The map(s) help me understand how changes in Beyoğlu affect each individual differently.
I consider the map(s) to be objective.
The map(s) is memorable.
Next
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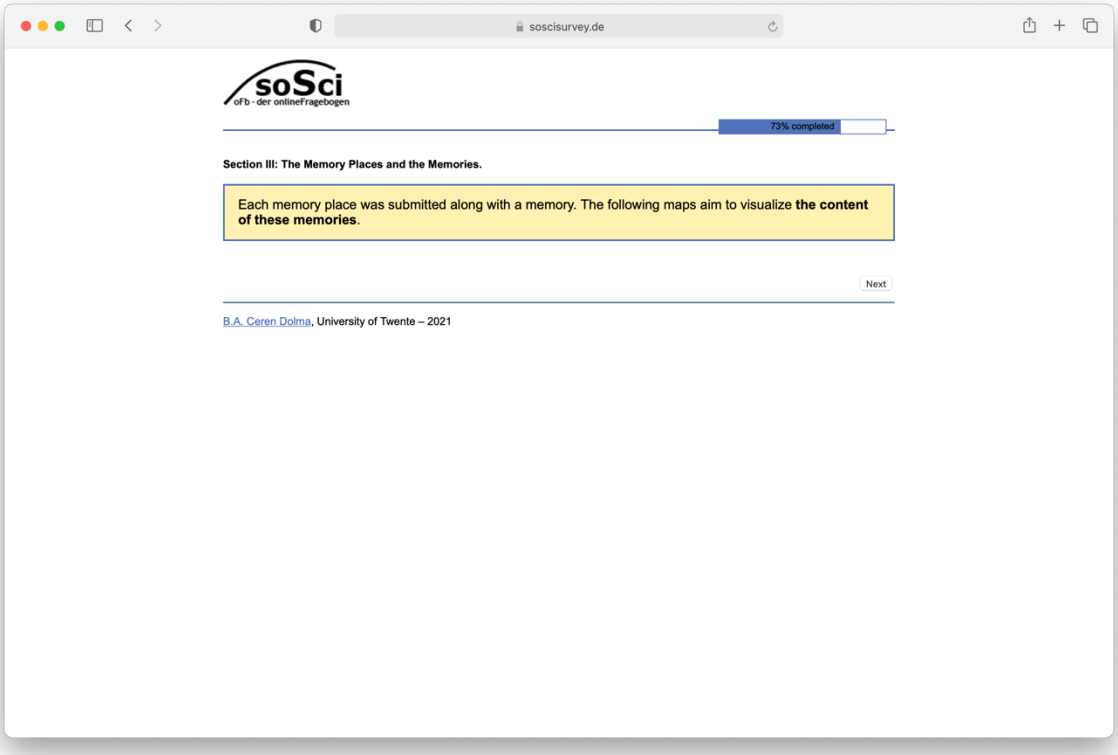
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73% completed
Section III: The Memory Places and the Memories.
Each memory place was submitted along with a memory. The following maps aim to visualize the content of these memories.
Next
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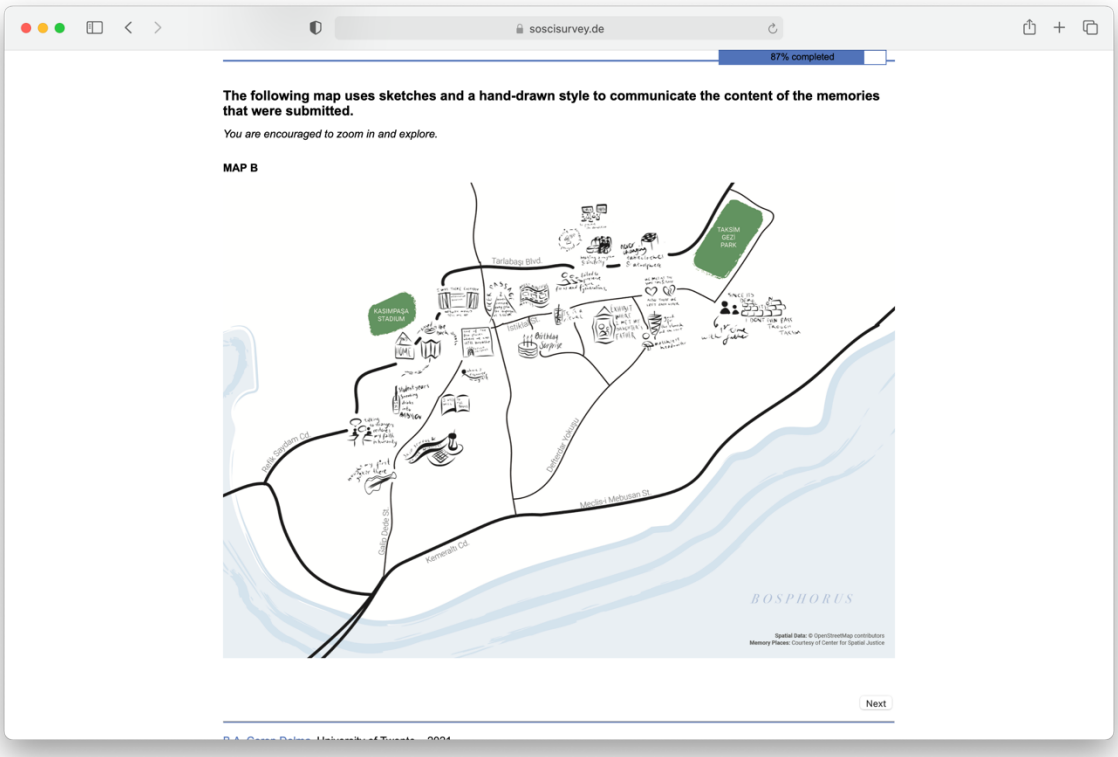
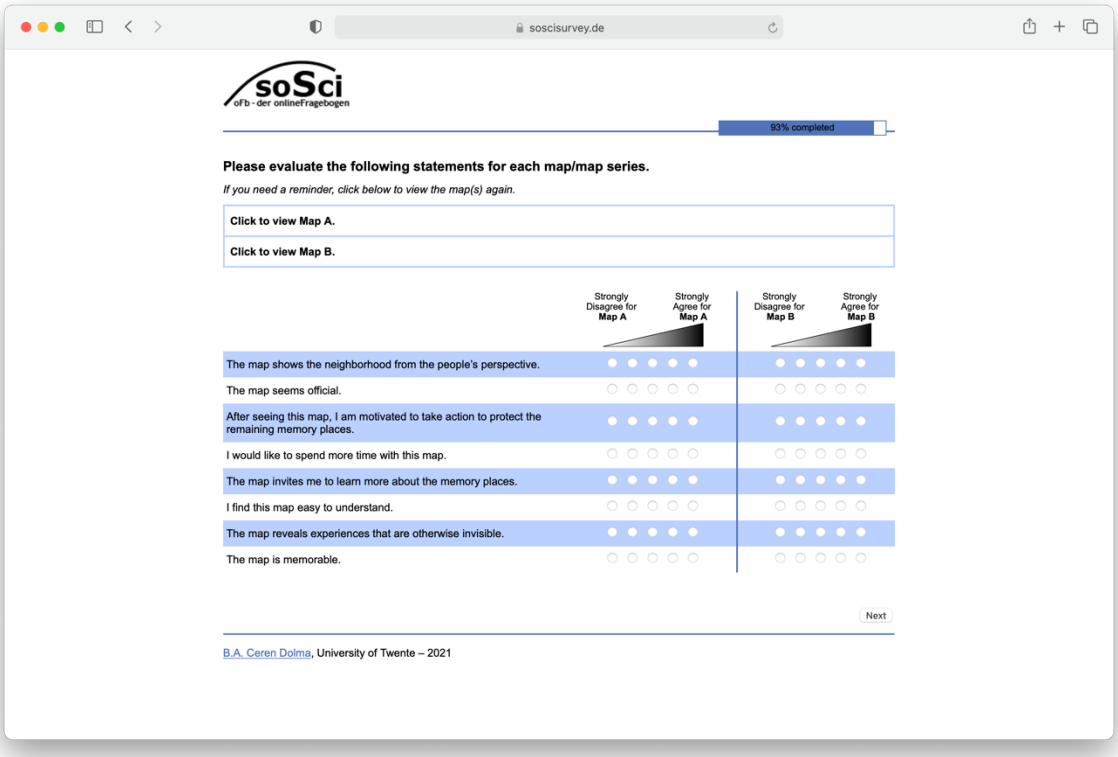
80% completed
The following map visualizes the approximate location of the memory places and uses a numbering system to match a sample of the memory places to the full text that was submitted.
You are encouraged to zoom in and explore.
MAP A
1 Helvetia Restaurant
Sharing a table with people I don't know and to bend those social class even just for a short while strangely strengthens my faith for humanity and makes me feel like a better person.
2 Alkazar Cinema
Beyoğlu was my second home when I was studying in Austrian High School. I first drank in Nevizade, kissed in all the back streets of Beyoğlu, with a booklet in my hand toured around the 9. İstanbul Biennale all by myself, went to all the exhibitions, festivals and theatres in Beyoğlu, I watched a gay movie alone in Out İstanbul LGBT Film Festival organized for the first and the last time in Alkazar Cinema and as a result of all this decided that I wanted to work in the field of arts and culture.
3 Çiçek Pasajı
One day during my first years in university, we were two women alone and we went into Çiçek Passage at three in the morning, just for excitement. And then we saw waiters come out from the dark shops and start running at us. We were so scared we ran like crazy.
4 Ali Muhiddin Haci Bekir
It's a ritual for me to drink lemonade and tamarind sherbet everytime I come to İstiklal Street.
5 Deep Restaurant
Deep's never-changing blue and white checkered table clothes, hurricane lamps, the food we had there, the coffees we drank...
Spatial Data: © OpenStreetMap contributors
Memory Places: Courtesy of Center for Spatial Justice
Next


soscisurvey.de
87% completed
The following map uses sketches and a hand-drawn style to communicate the content of the memories that were submitted.
You are encouraged to zoom in and explore.
MAP B
TAKSIM GEZI PARK
Tarlabaşı Blvd.
KASIMPAŞA STADIUM
Meşrutiyet St.
Kennedy Cd.
BOSPHORUS
Spatial Data: © OpenStreetMap contributors
Memory Places: Courtesy of Center for Spatial Justice
Next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93% completed
Please evaluate the following statements for each map/map series.
If you need a reminder, click below to view the map(s) again.
Click to view Map A.
Click to view Map B.
Strongly Disagree for Map A
Strongly Agree for Map A
Strongly Disagree for Map B
Strongly Agree for Map B
The map shows the neighborhood from the people's perspective.
The map seems official.
After seeing this map, I am motivated to take action to protect the remaining memory places.
I would like to spend more time with this map.
The map invites me to learn more about the memory places.
I find this map easy to understand.
The map reveals experiences that are otherwise invisible.
The map is memorable.
Next
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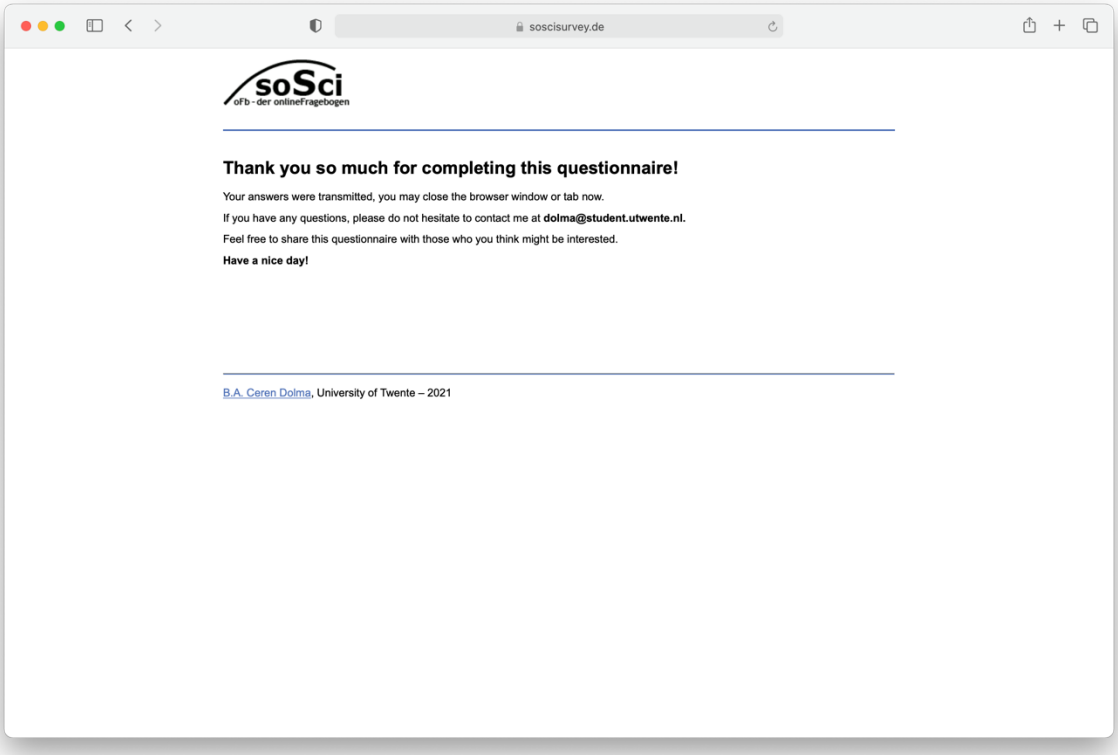
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Thank you so much for completing this questionnaire!
Your answers were transmitted, you may close the browser window or tab now.
If you have any questions, please do not hesitate to contact me at dolma@student.utwente.nl.
Feel free to share this questionnaire with those who you think might be interested.
Have a nice day!
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