

Exploring Methodologies to Capture Subjective Impressions of City Spaces

by

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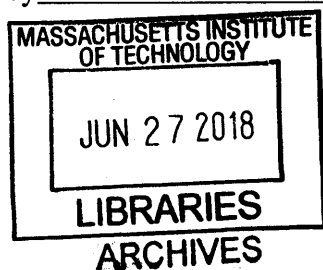
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Abstract

Cities and spaces are often examined with a focus on amenities or attributes that can be quantified or explained through patterns and movements by people. There are even numerous apps and services (Yelp, FourSquare, Google Maps to name a few) that provide platforms for adults to express their subjective feelings and opinions about restaurants, bars, landmarks, and public places, but as researchers have shown¹, these apps don't quite capture the full picture of meaningful places or spaces for people. Consequently, urban planners and architects designing cities take a specific, commercial viewpoint into perspective, with a bias towards the response of professional adults. As adults are not the only population living in cities, it is important and interesting to understand how people of different ages and socioeconomic classes—children, teenagers, and adults—and with different goals—learning, having fun, working—perceive the city and spaces around them in contrast or similarly to each other. This thesis uses Kendall and Harvard Squares to explore methodologies intended to capture the subjective perspectives and impressions of the city by children and adults alike. Specifically, methodologies that could elicit responses about perception relating to **memory, culture, state of mind, and social interactions** were explored. Participants were given a series of descriptive words and were asked to record an image in the Square that matched the word. They were also asked to express their impressions of places with their own words and playfulness. The results of the methodologies helped to form potential larger scale studies that would provide a deeper view of how a wider cross-section of the population perceive the city in terms of spaces they find creative, inspirational, and playful. Ultimately, this research seeks to understand the intangible qualitative perception of people in spaces and cities.

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Table of Contents

1 Introduction - pg 8

2 Background - pg 11

3 Prior Work & Literature Review - pg 14

4 Approach & Results - pg 19

5 Lessons & Takeaways - pg 39

6 Extending the Pilot Studies - pg 41

7 Conclusion - pg 44

Bibliography - pg 46

List of Figures, Tables, and Charts

- Figure 1: Rock garden in the neighborhood I lived in, Carson City, NV. 8*
- Figure 2: Map of Locations in Kendall Square Pilot Study. 19*
- Figure 3: Sample results from the Kendall Square Pilot Study at one of the eight locations. 20*
- Figure 4: Sample of the pictures from participants in the Kendall Square Pilot Study. 21*
- Figure 5: Sample of the features in photos from participants in the Kendall Square Pilot Study. 23*
- Figure 6: Participant taken photo at Grand Junction, Kendall Square. 24*
- Figure 7: Sample of zoomed in and zoomed out pictures from participants. 25*
- Figure 8: A word cloud of the top 11 words mentioned in voice memos. 29*
- Figure 9: A word cloud of adjectives mentioned two or more times in voice memos. 30*
- Figure 10: Classification of Outdoor Places that were chosen in the Harvard Square Pilot Study. 31*
- Figure 11: Classification of Indoor Places that were chosen in the Harvard Square Pilot Study. 31*
- Figure 12: Participant taken pictures of Lush (left) and Black Ink (right). 33*
- Figure 13: Participant taken photo of the Harvard Square T Station. 33*
- Figure 14: Sample narrative from one of the participants who decided Cubey was a Gangster. 35*
- Figure 15: Participant taken photo depicting Cubey as a college student. 36*
- Figure 16: Participant taken photo depicting Cubey as a girl who goes to get a tattoo. 36*
- Table 1: Most Often Photographed Features at the 8 Locations in Kendall Square Pilot Study. 22*
- Table 2: Most Often Photographed Feature based on Word in the Kendall Square Pilot Study. 22*
- Table 3: Most Often Chosen Places in Harvard Square Pilot Study Phase 1. 28*
- Table 4: Most Often Chosen Places for Cubey. 38*
- Chart 1: The breakup of the numbers of indoor locations and outdoor locations that were chosen in the Harvard Square Pilot Study Phase 1. 32*

1

Introduction

The rock garden of my childhood

In the sixth grade, I lived in a populated neighborhood in Carson City, NV. The street I lived on was lined with fourplexes. We had quite a lot of space in the center of our specific fourplex-block to play in, and kids in the neighborhood would visit often. It was quite joyous, but there was one specific place that we all discovered slightly further away that we really liked: a rock garden on the branch off to one of the smaller connecting streets in our neighborhood.

This rock garden was wonderful for many reasons: a slight incline allowed children to climb into the garden and climb out of it (this is important because it felt as if we were actually entering and exiting a special place). It was public so anyone could use it. There were thousands of rocks to pick and choose and play with, all different shapes, colors, sizes, and textures.

With the same rocks, people could do vastly different activities. One time, we all used the garden as a place to take our pick of pet rocks (I named one of the rocks Silver Blaze after a horse in one of the Sherlock Holmes stories). Sometimes, my friends and I would use the garden as a battleground against dragons, where we took advantage of the incline. We would throw rocks to mimic the dragons' powerful flames. Others used the garden as a place to make furniture and have tea parties. And others used it as a place to hang out. It was used by boys and girls alike, across all ages.

What I loved most about it was that people transformed the garden in to whatever they wanted it to be. And because it was central and close by and unassuming, it felt safe and welcoming. It was a clean and safe canvas for exploration and play, and that's what made it so wonderful.

However, I'm sure that the planners who built this rock garden did not assume that children would find this a fun place to play in. I've included an image from Google Maps below, and I believe it was built for function or landscaping purposes. This place that was made for landscaping was actually a place that children gathered at, hung out at, and played in. There are other unassuming places like that around a city, for both adults and children, and from the perspective of a city planner, it's important to study such places.

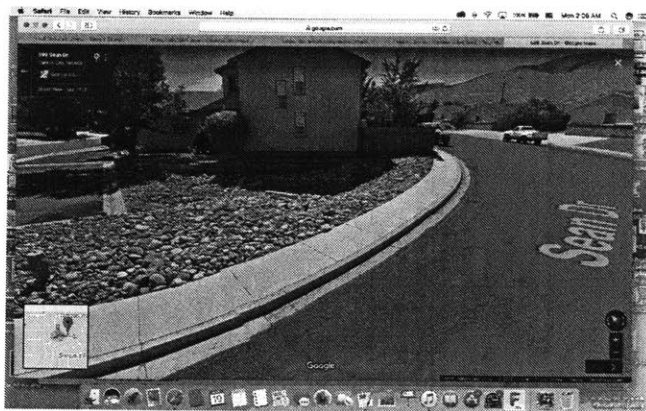


Figure 1: Rock garden in the neighborhood I lived in, Carson City, NV.

The Question at Hand

From this anecdote, I pose the question: what are places—like the rock garden—in a city that invite exploration and playfulness and creativity from the perspective of people across all ages? And how can we build more of these places or encourage the use of such existing places?

In this thesis, I approach the questions asked above in one phase that is composed of two parts. The first part is to understand **what** are places that people find playful, inspirational, and creative, and secondly to understand **why** once the places have been identified. A major part of this thesis is thinking through possible methodologies that would allow for a natural exploration of places that are playful, creative, and inspiring. Questions that will be looked at include: what types of establishments will show up most often, restaurants, public spaces, consumer spaces so on? Will there be commonalities across age and gender? Are places that are “meant to be” fun and playful chosen? These explorations will inform a larger, more scalable study.

Figuring out potential methodologies and learning from the process how to make larger studies will help inform potential future work that can contribute to making spaces that are inviting.

A potential next phase, beyond the scope of this thesis, could be start to build and implement more places in the city as experiments to see how people interact with additional “explorative-spots”. Public reaction to these experiments will be important in determining what might work larger scale and what might not work.

And after that, a subsequent phase could be to rebuild and reimplement in the city based on public response. The idea is to encourage people to have input in choosing spatial attributes, structures, and buildings that create places that invite exploration and playfulness. All of these phases are important in order to build more welcoming and playful cities that take into account the perspective of humans across ages.

Another Way of Looking at it

There are many apps that allow adults to express their opinions of a city and its spaces and establishments, such as apps like Foursquare, Yelp, and so on. However, these apps generally focus on consumer opinion which is gathered after the space has been built. Is this restaurant affordable, do they have spicy food, how is the service time... and so on. There are very few (if any at all) well-known, highly popular apps that are looking at the popularity of places from the way of ‘impressions and feelings’ and ‘inspirations’... This is an aspect this thesis will start to approach. What are spaces that are inspirational, creative, playful, and how can people start to share those aspects of the city amongst each other? Additionally, will people across ages have the same reaction towards places that inspirational, creative, and playful?

As Christopher Alexander writes in A Pattern Language, “In a society which emphasizes teaching, children and students—and adults—become passive and unable to think or act for themselves. Creative, active individuals can only grow up in a society which emphasizes learning instead of teaching... If children are not able to explore the whole of the adult world round about them, they cannot become adults...” (294)². To extend this philosophy to people past the age of 18, I would like to add to the first part: “creative, active individuals can only grow up in a society which emphasizes learning instead of teaching...”: if adults are not able to explore the world around them, their minds are narrowed.

The Importance of Thinking about Qualitative Perception

Places are designed with a purpose in mind. Some places are used for their intended purpose and some are completely re-appropriated by the inhabitants or occupants or visitors and used in radically different and radically similar ways.

How do people perceive places and spaces? How do people use spaces either in line with or completely veering away from the original intention of a space? These are notions this thesis also will start to weave in to a methodology for understanding a person's perception of spaces.

Findings from a study that explores these questions could inform how to make better cities and could also start to think about how best to engage the community.

In the City Science group at the Media Lab, we think about insight transformation. Thinking about the qualitative perceptions of people about places and spaces is a type of insight one can gain. There are a lot of urban science efforts, and urban data analysis, that focuses on the quantitative, but this thesis attempts to approach the qualitative.

We need both qualitative and qualitative analysis when thinking about making the city a better, healthier, inspiring place.

This thesis attempts to test pilot studies to inform a larger, more scalable study that can start to understand how people qualitatively (and quantitatively) perceive place and space.

Background

A deeper look at the inspirations guiding this work

I like **divergent individuality** that emerges from **collective experiences**, spaces, sparks, places.

Collective experiences, spaces: The world is shared amongst people. Cities are shared spaces. Each person has their own way of using a space in a city, but the architecture, infrastructure, and environmental details remain the same, though they are viewed by and touched by many people. This is how I use the word “collective”.

Divergent individuality: Though we may all eat in restaurants, walk or run or play in parks, buy clothes in a fashion store, each of us experiences a place through our own lens of memories, background, upbringing, needs, necessities, and mood. How can we capture these divergences in order to bring people together and let people converge in a positive, healthy, and happy way?

An individual’s reaction to a space is completely or partially informed by their accumulated experiences in the space. It’s not that one specific attribute will impact a person’s experience of a place per se, it depends more on the whole environment, ambiance, history, experience, and present state of being, and my approach is trying to draw that out.

Below are three inspirations that further guide this exploration of people’s perception of cities.

(1) Kevin Lynch, *Image of the City*

As Kevin Lynch writes in *Image of the City*, “Nor only is the city an object which is perceived (and perhaps enjoyed) by millions of people of widely diverse class and character, but it is the product of many builders who are constantly modifying the structure for reasons of their own” (2)³.

Lynch believes that “every citizen has had long associations with some part of his city and his image is soaked in memories and meanings” (1)³. However, “an environment which is ordered in precise and final detail may inhibit new patterns of activity. A landscape whose every rock tells a story may make difficult the creation of fresh stories” (6)³.

I agree with Lynch’s statement of what the Image of the City should be like:

“The image should preferably be open-ended, adaptable to change, allowing the individual to continue to investigate and organize reality: there should be blank spaces where he can extend the drawing for himself. Finally, it should in some measure be communicable to other individuals” (9)³.

A city or a particular landmark in a city or a street that has always been used as something and has never been seen as anything else can be quite stifling in some cases. Spaces and cities that are open to change and open to transforming themselves to allow for new purposes or creative expression would allow people to form new associations. These cities would also potentially inspire more creative collisions and cross cultural exchange as opposed to cities with the same places that are visited by the same crowd at the same times every single day.

Cities are considered under many names. City as innovation hub. City as economic center. City as walkable. City as the center of democracy. City as financial center.

Delving further, cities can also be considered under the names of: city as discovery, city as exploration. Place as discovery, place as exploration. City as a platform for memories and learning and understanding and playing.

As Lynch also writes in Image of the City, “As an artificial world, the city should be so in the best sense: made by art, shaped for human purposes” (95)³. This description of the city is provocative. A city should be creative, enjoyable, expressive, and should also be functional and purposeful and meaningful for all humanity.

This thesis thinks about city areas like Harvard Square and Kendall Square with the spirit of ideas presented in the Image of the City, trying to determine how people build their impressions of what Harvard Square and Kendall Square can be for them and what stories people imbue in the spaces of the two Squares.

(2) Jane Jacobs, William H. Whyte

As evidenced by numerous city planners, architects, journalists, and people-watchers, the street is central to interaction, attraction, and community. The pleasantness of a street can draw out people, and the unpleasantness of a street can deter people.

As Jane Jacobs writes in The Death and Life of Great American Cities: “In cities, liveliness and variety attract more liveliness; deadness and monotony repel life. And this is a principle vital not only to the ways cities behave socially, but also to the ways they behave economically” (99)⁴. Public city sidewalks “bring together people who do not know each other in an intimate, private social fashion and in most cases do not care to know each other in that fashion,” (55)⁴ Jacobs writes.

William H. Whyte states that “the street is the river of life of the city, the place where we come together, the pathway to the center”⁵. I decided to take to the streets of Harvard Square and Kendall Square in my protocol to see what would be most attractive and inspiring for people. As Whyte states, “people vote with their feet” and “what attracts people most, it would appear, is other people”⁵. These thoughts in mind, I wanted to see what people would vote for. And if people across ages had similar votes or if they had completely different spheres of places they interact in and visit.

While this is not a truly comprehensive study, I looked more at the methodology, to see if this protocol is something that is viable to start to get people thinking about and looking at spaces that people vote for physically with their feet.

(3) C.S. Lewis, The Shoddy Lands

In the appendix of Lynch’s Image of the City, there’s mention of a short story by C.S. Lewis titled The Shoddy Lands⁶. In this short story, a man goes into the head of a woman and experiences the city completely through her perspective and her interests and likes. He sees that she hardly cares about trees or nature, and instead focuses on jewelry shops and women’s clothing stores and shoe stores in vivid detail. Everything else is fuzzy in her eyesight. Flowers in the wild mean nothing to her, yet flowers as objects of affection, flowers given to her by someone in the form of a bouquet, for example, are more important. Through the blocks of blurriness and the pockets of vividness, the narrator is able to understand the inner motivations

and vanities of the woman. He is able to understand the way she wants to live and be, the lifestyle she prefers.

I found this short story to be quite telling: remarkable features in a city or place or life and how and what is blurred for someone might reveal quite a lot about that someone's personality and necessities and motivations.

This is what the thesis explores: the seemingly intangible necessities and motivations and dreams based on remarkable features or places or spaces in a commonly shared and frequently visited space or place.

**

These three concepts—the Image of the City and how people repurpose the image according to their own motivations and backgrounds, the importance of sidewalks and how activity attracts more activity, and the fact that people notice that which reveals more about their necessities and motivations—really guide the approach and methodologies attempted in this thesis in trying to answer the questions posed earlier in the introduction.

Motivations and dreams and explorations and inspirations are considered to be intangible, and that's the very reason they shouldn't be ignored in studies of the city. These concepts should be studied in ways that try to be natural and thoughtful and reflective. In understanding these concepts better, city planners, architects, designers, engineers, can potentially start to help build spaces and places that are truly welcoming and accepting for all of society, children, adults alike.

Prior Work & Literature Review

This thesis will explore several themes related to perception of the city, and in this section, I will touch upon some interesting theories and work being done in these areas. First, I will mention the themes that I considered while working on this project. There is, of course, a lot of work being done in other areas related to the city and how people interact with the city around them from safety, health, infrastructural, political, educational, and other standpoints, but I will specifically focus on the following four themes.

1. Human, Environment, and Place
2. Children and City Spaces
3. Perception of Spaces (very brief Neuroscience + Sensory perspective)
4. Mobile Services and Space Perception

This section will probe into some interesting research being done in these four areas. There is a whole range of literature related to these topics that will not be explored: instead I'll be highlighting some research and points that are relevant to the way I take my thesis.

(1) Human, Environment, and Place - (Environmental Psychology perspective)

Researchers have attempted to study the relationship between human and place in many interesting and novel ways throughout the years.

Yi-Fu Tuan, whose work is very well known in the field of environmental psychology, presents the idea of topophilia: the affective bond between people and place. Tuan stresses that understanding the environment requires understanding human behavior and attitudes and values⁷.

Stanley Milgram's famous "Psychological Maps of Paris" study attempted to explore how Parisians mentally represented their city, to not examine "Paris as a geographic reality, but rather of the way that reality is mirrored in the minds of its inhabitants" (88)⁸.

Milgram shares a thought that the city itself may one day be destroyed, and even the human with a mental model will one day die, but "the maps encoded in millions of human brains are not thereby destroyed" (88)⁸.

In an attempt to get a tangible representation of the mental model that could last, Milgram asked his subjects to draw a map of Paris with elements of the city that they could think of, like monuments, squares, landmarks. They were told not to make a touristic map, rather, just a map or drawing that expressed their own view of Paris.

The result of this study is that the mental maps became projections of lifestyles and also expressed emotions of the person.

Another important point that Milgram notes is that cities are social facts, and accordingly, the perception of said cities are also social facts. Understanding perception of the city requires studying it from a collective as well as individual perspective. Features that are highlighted by the community and rest in the mind of the person are those that are revealing about the representation of the city. Milgram writes, "We discern the major ingredients of that representation by studying not only the mental map in a specific individual, but by seeing what is shared among individuals" (93)⁸.

Many other studies have looked at place attachment and identification. Felonneau argues that "while representations of the place are grounded in social experiences and acquire different

values, they also constitute a deep expression of the subjectivity of the person. Regardless of their valence, they need to be included in the analysis to measure their influence on the relationship between people and their environment”⁹.

The relationship between environment and place seems to be linked to both an affective, emotional bond (place attachment) and a cognitive bond which is related to perceptions of self as part of a physical space (place identification). Place attachment also seems to be dependent on social and relational interactions⁹.

One particular study¹⁰ looked at the semantics related to the environmental perception of the city of Turin. As part of their study, the researchers attempted to explore subjective perceptions that individuals had towards the environment. In order to do this, they asked their participants to answer a few questions including this one: “Think of the town of Turin and write the first five words that come to your mind” and also “Write the first five words that come to your mind reading the statement: ‘being Torinese means’”. They compared the results of these questions with questions about how involved the participants felt/were in their community in terms of how long they had lived there, if they were involved in any clubs, etc. They found that “participants with high attachment described the city in an exclusively positive way.”¹⁰

They found that “diverse individuals attribute to the same environment different features and meanings, in accordance with their level of place attachment. In other words, the place perception relies not only on the information available in the environment but also on the perceiver’s characteristics”¹⁰.

The point is that in order to understand the relationship between places and people, it is important to understand the semantic, emotional representations people have of their environment.

Particular spaces are used in specific ways and there is an increase in the perception of how those spaces ought to be used and thus places can be repulsive or attractive. Public spaces are used in different ways by different parts of the population. According to survey and observation data, people will stay longer in and are drawn to public spaces that seem interesting, comforting, or provide stimulation of some sort. Also according to interviews and surveys, spaces get reputations that are persistent and have an effect on how those spaces are being used¹¹.

Streetscore¹²

A collaboration between the Collective Learning and Camera Culture groups at the MIT Media Lab, Streetscore examines the perceived safety of a street. Streetscore tweaks the features in images of streets in order to see how people change their perception of the safety given different image features. The researchers were able to show that the addition or subtraction of certain simple features in an environment can truly impact perception of a place for indicators like safety or livability.

The relationship of human and place from an environmental psychology perspective relies not only on the observation of features in an environment, but also on the mental models, values, attitudes, and subjective perceptions of people in that place: the qualitative thoughts are crucial to get a holistic understanding of the relationship of human and place.

(2) Children and City Spaces

Over a billion children are growing up in cities. Interestingly, public space that is developed is predominantly considered to be adult space¹³. Children’s opinions hardly matter in these cases. UNICEF and other organizations are trying to get children involved in helping plan cities, with the belief that children should be seen and heard¹⁴.

Thinking about spaces for children doesn't just mean thinking about adding specifically designated "children's places" like playgrounds in separate parts of the city: it means integrating facets of children's places into the urban landscape. It also means thinking further about housing and support services¹⁴.

Integrating such facets into current cities will help make healthier cities in general because safety and accessibility and ease of use will be considered deeply when children are taken into account. Planning for children, then, is beneficial not only for children, but also for vulnerable groups like the disabled and elderly¹⁴.

Aldo Van Eyck Playgrounds¹⁵

Van Eyck introduced a series of playgrounds throughout Amsterdam that all essentially had the same elements in them (such as a circular sandbox, round platforms, climbing structures). These playgrounds were placed in all areas of the city so that children from all backgrounds could come to enjoy. This experiment paved the way, some say, for modern playgrounds in places like America that all seem to have some of the same features (climbing material, swings, etc). This experiment was also approaching the idea that certain features in a city can inspire playfulness in a more "we build it, they'll come" way.

While my study wants to see what are the features in the city that do inspire playfulness, Van Eyck's playgrounds take an approach of believing that children will find some way to be playful and have fun with the features that are imposed (thought of) by the architect/city planner. And the playgrounds were successful.

[An aside to think about, many people do point out that a child's imagination is creative enough to find something to play with despite the environment.]

Studies with Children

A study in the Netherlands¹⁶ looked at neighborhoods in one of the towns and tried to see how children perceived the area through qualitative methods. The researchers actually used a mixed-methods participatory study, which the authors noted could result in repetitive information, but would still provide more comprehensive information about how children perceived the city spaces around them. The study focused more on groups of children visiting the same places and answering questions about the places. The methodology focused on written and spoken responses to the questionnaire. The results focused on categorizing based on positive and negative feelings the children had about the town's spaces based on the words they said and found that they could get solid information about places that were most often visited and liked by children and understand the perceptions or biases the children had towards the town's places in general. The study was simple and informative, but only focused on children and did not attempt to include adults.

(3) Perception of Spaces (very brief Neurobiology + Sensory Perspective)

When some people might claim vision is the most telling way of understanding the perception of place, it's important to remember that vision alone isn't enough to form a comprehensive image of a place, for the sounds, smells, tastes, and tangible qualities of a city are important in our holistic understanding of that city¹⁷. When we perceive things, we perceive them a little bit with all our senses. One of the senses might feel more dominant, but all can

play a part in some way or another. Literature in architecture may tend to focus on vision and texture, but all sensory modalities including vision, touch, audition, and also things like balance and positioning converge in order to form a reliable and accurate multimodal percept¹⁸.

Instead of just trying to understand the visual features that are important in letting us perceive place, we must attempt to learn a more holistic understanding of what makes a place tick for someone.

Considering the neurobiology of spatial memory, the hippocampus is involved quite heavily in navigation and the formation and retrieval of memory of autobiographical events¹⁹. As the hippocampus is involved in both, memory and sense of place are intimately entwined. Our memory of events can depend on a strong sense of place, and also, our sense of place can be influenced by the memories formed in places¹⁹.

Research involving rats and the hippocampus has also shown that as the animals navigate through their environment and individual neurons respond, these individual neurons are not activated by one type of stimulus like a visual feature or a sound or smell. Rather, they are activated by a combination of features that define the animal's internal sense of place²⁰.

Other research has shown that when places are explored, the memories retrieved later of that place are not composed of isolated locations, but rather the sequences of the connected locations²¹.

(4) Mobile Services and Space Perception

Many apps use location-based services to recommend their users places to visit or explore, or to help their users find events, things, people, and so on. Some research has been done on seeing how the usage of such apps might have changed or impacted people's perception of and interaction with their city.

In this paper¹, researchers conducted a version of Milgram's (referenced above) Paris Study in Chicago.

Researchers tried to keep the protocol the same as Milligram's, but asked their participants additional questions about their mobile location app services usage (Yelp, FourSquare, etc). They were trying to determine the impact of mobile check-in devices on the way participants view a city. Interestingly, they found that usage of mobile check-in services correlated with greater likelihood of participants traveling around a city and knowing more of it in better detail, regardless of age or educational background¹.

However, they also found that the categories of places that people represented the most in their drawings as 'important' were parks and arts related categories: apps like FourSquare, meanwhile, tended to focus on food and consumer places. The researchers concluded that "existing mobile services are not widely used in the places that are considered most important to our participants"¹.

There are also studies that have looked at how social media is impacting perception of a city. A study in Spain²² used Instagram to see how a change in one of the streets impacted public perception of that area and to see if Instagram could help describe the socio-spatial patterns of the city.

Researchers around the world seem to agree that social media can definitely be used as a powerful tool to provide insight into how people are interacting with their city and gauge how people feel about any changes or additions to their city.

Key Takeaways

1. Perception of place is heavily influenced by human subjectivity
2. To make better cities for everyone, let's start thinking about the perspective of children and integrating features of play and learning into the city
3. The look of a space or place isn't the only factor in determining how people perceive that place. The brain uses all the senses as well as memories to make a model for a place.
4. Social media can definitely be a powerful tool to explore how people feel about a city, but social-location-based apps don't necessarily capture the true important places of a person

These are all thoughts that influenced the approach my thesis took to examining places in Kendall Square and Harvard Square. Thinking about **memory**, **culture**, **state of mind**, and **social interactions** are highly important in the context of thinking about spaces and cities, and I attempt to explore methodologies that can elicit the mention and explanation of these four concepts in the perception of spaces.

Approach & Results

Section 4 will go through three pilot studies—the Kendall Square Pilot Study, the Harvard Square Pilot Study (Phase 1 and Phase 2)—and the results from each study. Kendall Square focused on a study that could extract remarkable features in an environment, Harvard Square Phase 1 focused on eliciting locations that are creative, inspirational, and playful, and Harvard Square Phase 2 focused on the implications of introducing a 3rd person object in the study.

4.1 Kendall Square Pilot Study

Kendall Square was chosen as the first location for a Pilot Study because there has been a lot of interest in the current revitalization of the Square. Kendall Square is predominantly comprised of MIT buildings and Industry buildings. It is not known to be a residential area; it is more thought of as a workday hours place where working professionals and students are around during the day and leave once it's evening.

The idea behind the Kendall Square Pilot Study was to explore methodologies that would try to identify features in a set of places that people were drawn to or repelled from, to see if there was any type of consistency in the attractive and repulsive qualities of places.

In order to do this, a total of 15 participants (3 children (between 7-12) and 12 adults (between 18-65)), walked on a path with me, the researcher, to visit 8 predetermined locations in the Kendall Square area. These locations included: the Kendall Square T Station, MIT Media Lab, Stata, Grand Junction, Kendall Square Rooftop Garden, the Galaxy Earth Sphere in front of Microsoft, Evoo/Za open space area, and the area by the dock past Evoo/Za. Below is a map with a general marker of the locations.

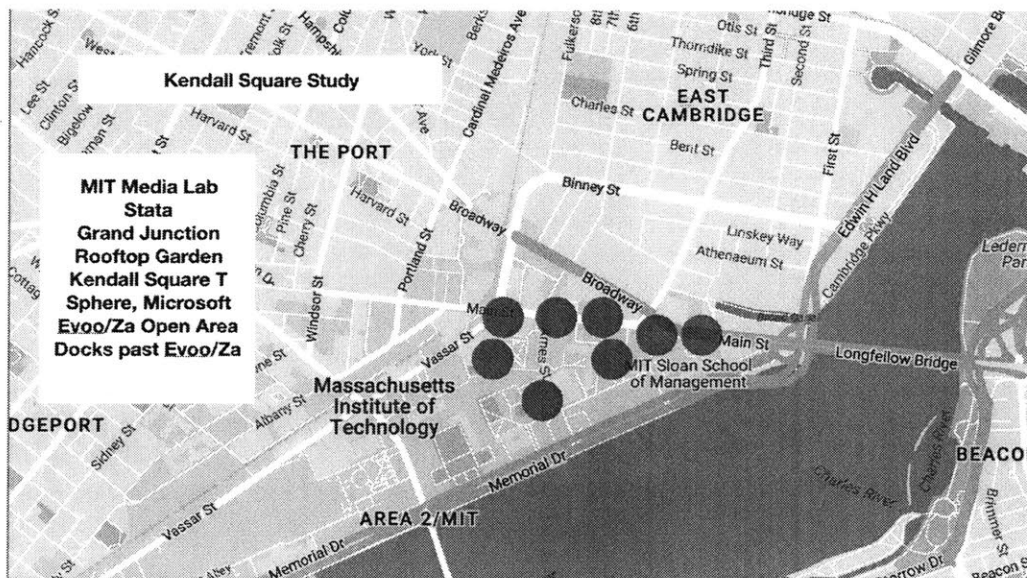


Figure 2: Map of Locations in Kendall Square Pilot Study.

Participants were asked to take pictures that represented the place first—this was both a marker in the pictures to signify the location and also to see if people had the same idea of what they thought the “location” was. At each location, participants were asked to take eight other pictures: they were asked to find something in the location that was beautiful, ugly, safe, dangerous, peaceful, chaotic, interesting, and boring. These words were chosen as they are relatively understandable and applicable across spaces. The order that the pictures were taken in was always the same.

The study took on average about 45 minutes to an hour to complete because of the walk path. Participants took pictures on their own phones and sent them to me through email attachments or Google Drive.

Originally, participants were just required to take pictures, but then as it was hard to understand the motivation or reasonings behind some of the pictures, or even what some of the pictures were focusing on, participants were also asked to annotate their pictures with words that expressed their reasoning behind choosing certain features for certain words.

Below is a sample representation of results from a participant.

Sample Results: Stata

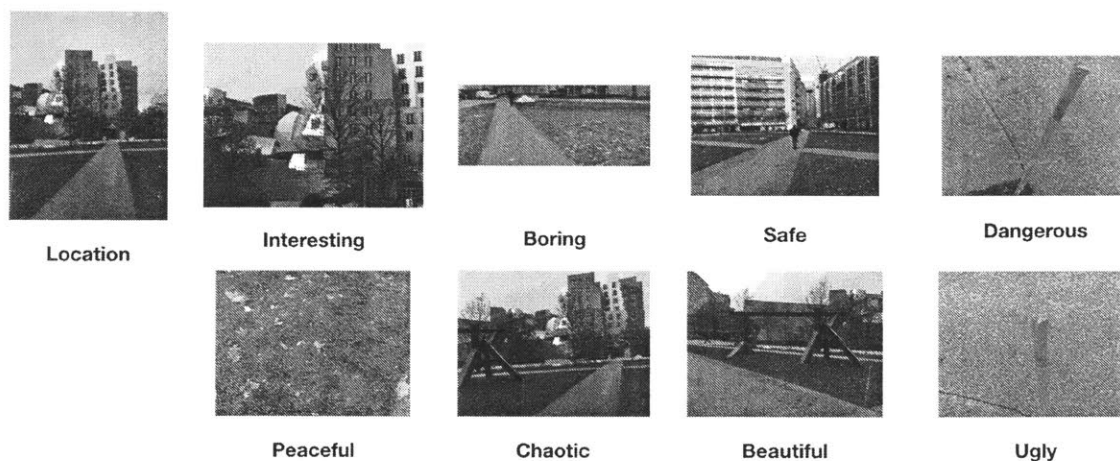


Figure 3: Sample results from the Kendall Square Pilot Study at one of the eight locations.

Results of KSqPilotStudy

Overall, around 1000 pictures were taken. Here is a sample of 99 of those pictures.

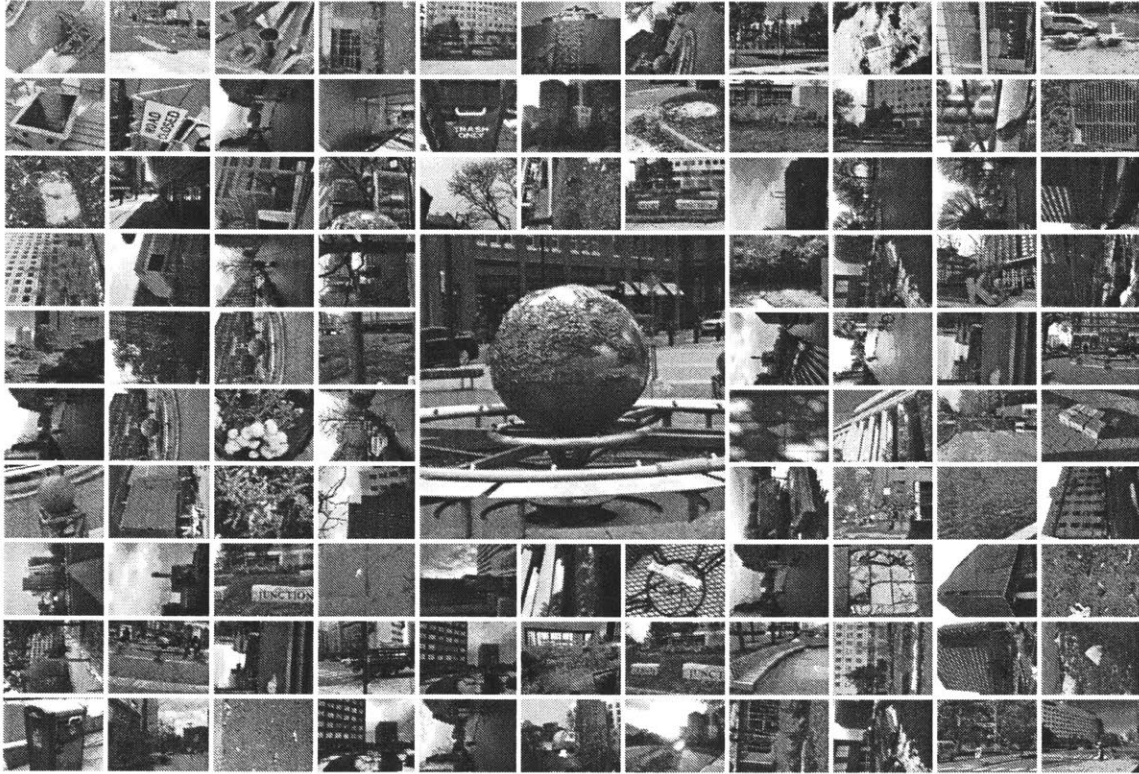


Figure 4: Sample of the pictures from participants in the Kendall Square Pilot Study.

Below are a series of tables providing an overall view of the results. The first table looks at the eight locations and looks at the most often mentioned features. The second table looks at the eight words and sees what features were taken the most often.

Place	Most Often Photographed Feature
MIT Media Lab	MIT Media Lab front facade
Stata	Stata Building, and the Red Sculpture
Grand Junction	The chairs of Grand Junction
Rooftop Garden	Greenery of the garden
Kendall Square T Station	The crosswalk between Inbound/Outbound
Sphere Corner outside Microsoft	The sphere
Evoo/Za	The chairs (or lack of chairs) outside
Docks past Evoo/Za	The boats, and the sculpture nearby

Table 1: Most Often Photographed Features at the 8 Locations in Kendall Square Pilot Study.

Word	Most Often Photographed Feature
Beautiful	Greenery (trees, flowers, etc)
Ugly	Trash cans or the ground
Safe	Crosswalk signs, streetlights
Dangerous	Crosswalks and cars
Peaceful	The location itself
Chaotic	Traffic and cars
Interesting	Highly dependent on the location
Boring	The ground

Table 2: Most Often Photographed Feature based on Word in the Kendall Square Pilot Study.

Generally, the photos for negative words were similar, whereas the positive words resulted in a more diverse range of photos. For the negative words, traffic, cars, construction, the messy crosswalks, and trash were quite often chosen.

As people shared their sentiments, it was obvious to tell that most participants did not like the messiness and the frenetic aspects of the crosswalks and streets of Kendall Square, paired with the construction going on that has disrupted some paths.

Same Picture, Different Words

Participants tended to take the same picture for multiple words, and in this way it was hard to identify what feature or what aspect of the picture represented a certain word. Here's an example of this.

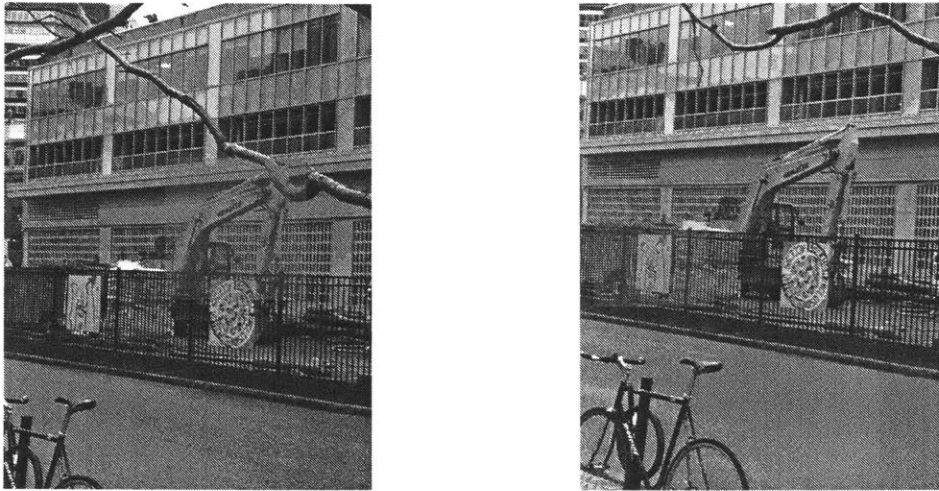


Figure 5: Sample of the features in photos from participants in the Kendall Square Pilot Study.

In the left side photo, the participant said the construction machinery was boring. In the right side photo, the participant said the poster was interesting. There would be no way for the researcher to tell that if it hadn't been for the verbal explanation.

There were other examples of this. For example, the MIT Media Lab front facade was one of the most often taken pictures at that location. Everyone had their own interpretation of the lab. Some people thought it was beautiful and interesting, others thought it was boring or ugly. This reflects the personal opinion of the participant, but it doesn't get at why the participant feels that way. And that is what the conversational element of the study allowed for me to understand. Some people explained they found it boring because of the color scheme. Some people said it was interesting because of the design.

There's also this example below, taken at Grand Junction.



Figure 6: Participant taken photo at Grand Junction, Kendall Square.

The participant described this scene as both beautiful and peaceful, using those words in their explanation. For example, she said it was a beautiful place because it was peaceful, and it was a peaceful place because it was beautiful.

In general, there was not much diversity in the pictures (the types of pictures) that were taken by participants. Participants mentioned this as a comment as they walked with me. Others complained that it was hard to find representations of all words in some places, and in general, many pictures taken in certain places were the same, such as pictures taken at Stata, the Media Lab, and the sphere in front of Microsoft.

Zoomed In vs Zoomed Out

There was also the case where people took pictures either extremely zoomed in, in which case it was very clear what feature people were referring to in pictures, or just a regular shot, in which case it was very hard to understand what people were referring to.

In the case of the picture to the bottom right, one person had four different explanations for this exact same picture. The car was dangerous, the street sign was safe, and the sidewalk was boring, and the pile of snow was ugly.

If we want a computer to one day classify these pictures, imagine the complexity of the picture to the right. In such a case, it might be beneficial to have an explanation of what elements in the photo represent what word, and also have a tagging feature where people can specifically tag features of the photos.

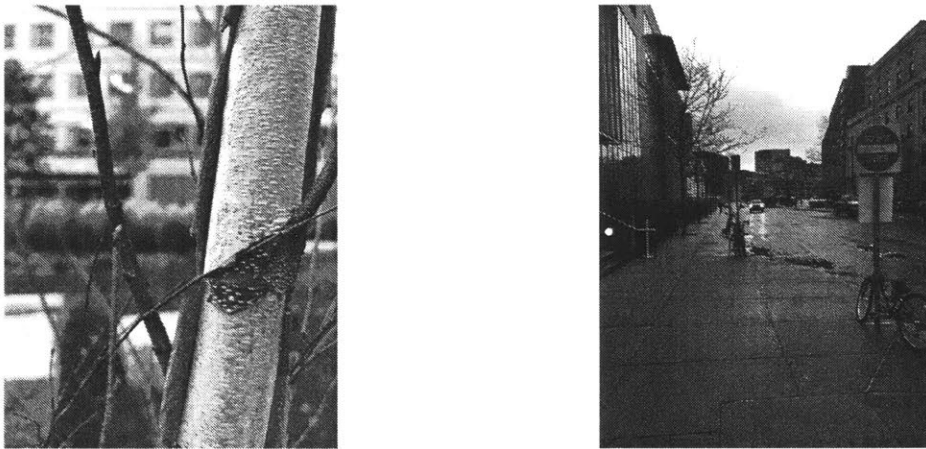


Figure 7: Sample of zoomed in and zoomed out pictures from participants.

The Rooftop Garden and Dock Area

Of the eight places, the two places that were the least known by participants were the rooftop garden and the dock area. Participants were most enthusiastic and excited in these two places, as evidenced by their overt statements of surprise and eagerness to explore.

“The aesthetics of the garden are gorgeous,” one participant remarked. A few participants spent a bit longer at the rooftop garden and the dock area.

Temporary Features in the Environment

Some people chose to take pictures of people walking by, or people in general. One of the girls who completed the study took a picture of her mom in every place when asked to take a picture of something interesting.

One of the adult participants took a picture of three people crossing Main Street haphazardly to signify dangerous in the Kendall Square T location.

In such cases, it wasn't stationary features of the environment, it was the interaction or events happening in the environment that elicited certain thoughts or words.

Takeaways

Takeaways from Kendall Square include that people do not classify it as a hang out place and people generally found Kendall Square to be unappealing. Negative words resulted in similar and consistent images across people, namely, construction or traffic or sidewalks or trash. Positive words resulted in a variety of images. The rooftop garden and docks area, which were the least known places by people, caused the most excitement and exploration. Overall, people found the eight words to be constricting, and couldn't necessarily find all words in all areas.

However, this study did start to **extract features** in places and especially when people explained their reasoning for choosing certain features in places, the study was able to elicit **memories** and **thoughts** of people.

Limitations

Although participants mentioned they enjoyed the study, they did admit that the words seemed contrived, especially because they were required to find the same words in all eight locations. A few participants mentioned that there were words that they wouldn't naturally associate with some of the locations. Participants also mentioned that Kendall Square felt very uniform for them. Many participants pointed out that Kendall Square is a very boring, industrial, work place and is not a place to hang out: it is a place solely to work. Additionally, participants mentioned the construction as unappealing for the eye.

Another point is that the Kendall Square Pilot Study was mainly conducted in November and December, when the weather was cold and getting colder. Participants were really kind and traversed through the protocol despite the cold weather, but it would be informative to do a similar protocol but in the summer.

4.2 Harvard Square Pilot Study Phase 1

5 children and 16 adults participated in the Harvard Square Study. The study took anywhere from 20 minutes to ~one hour to complete, depending on the speed of the participants through the two phases of the study. The first task asked participants to take me, the experimenter, to five places the participant finds creative, inspiring, or playful in Harvard Square. The participant can interpret those words in whatever way they choose to. The participant is asked to take a picture of that place and then does a voice recording of why they took me, the experimenter, there.

The words—creative, inspiring, or playful—markedly different from the Kendall Square study, were chosen because they allow for many personal interpretations across people. As mentioned in a prior section, these words are not as often explored in the context of perception of spaces as are the words from the Kendall Square Pilot Study.

There is an assumption that the participants have been to Harvard Square before and are aware of the area. If they haven't been to Harvard Square before or are not very familiar, then the experiment takes a slight turn and the participant is asked to explore with me, the experimenter, until one or more locations catch their fancy. Most participants were quite familiar with Harvard Square—they had either lived in the area, worked in the area, or studied in the area.

Results

Phase 1 General Thoughts

The bounds of Harvard Square

As this study was meant to be as free-form as it could be, and open to the interpretation of the participants, there were no clear boundaries set on what 'Harvard Square' is. As such, participants went to the edge where JFK St meets the river, the Weeks Footbridge, Church St, residences past Harvard Divinity School, and Cambridge Public Library. Most people classified Harvard buildings as a part of Harvard Square. Only a few considered Harvard Square as solely the establishments and restaurants excluding Harvard buildings.

Participants interpreted the words creative, inspirational, and playful very freely. The interpretations will be discussed further below. Across ages, bookstores were a reoccurring theme. Interestingly, Harvard Book Store was almost always chosen over the Coop or the Poetry book store. Black Ink, Lush, two establishments in the square, and the Harvard Square T, were chosen commonly. An interesting difference between how adults and children approached the task was that children would often just start leading without any questions; kids often completed the task much quicker than the adults. Adults asked many questions such as: "does this place count?" "is this area a part of Harvard Square?" Adults took more time on average to decide on the five places. While walking between places, people also generally shared their thoughts on other cities or places they've been, or just what they like in general in the area.

Most Often Chosen Places

Below is a table with the five most often chosen places by people in this phase. In this phase, 70 places were overall identified.

Place	Number of People Who Chose Place
Harvard Bookstore	4
Lush	4
Cambridge Public Library	4
Grad School of Design Area	3
Petali	3

Table 3: Most Often Chosen Places in Harvard Square Pilot Study Phase 1.

The interpretation of: creativity, inspiration, and playfulness:

In their voice recordings, participants described their own interpretation of the prompt in the following words:

Creativity:

- Allow for exploration of products or objects
- Endless possibilities of things to read/learn about
- [Place with] different kinds of objects together (sparks some creativity and thinking about how these things might connect or are not connected at all)
- Collaborators gather to discuss projects

Inspiration:

- Quiet place to reflect
- Vantage point
- Waiting [place]
- Peaceful spot
- Aesthetics are gorgeous
- Relaxed—lot of my best ideas
- (Place to) find all the trinkets
- Opens up my eyes to different (fields)

Playful:

- Reminder of one of the stupidest things I've ever done
- Fun time
- Reminds me of my childhood
- Encourage you to touch things and play with things
- Be silly

In essence, people interpreted the words in their own ways and guided me, the researcher, to all these different places depending on their own interpretation. And though people used their own interpretations, there were common types of establishments that showed up in the results. Book stores and libraries were a favorite. One participant quipped: “Bookstores are the place adults are allowed to go to be playful,” going on to state that children had so many places they could play in that would be considered normal, whereas there weren’t many obvious places for adults to play in.

Establishments like Lush and Petali were another top choice that tied these words together.

And lastly, open spaces and parks were quiet popular choices as well.

Voice Memos Word Clouds

Here is a word cloud of the top 11 words that were mentioned in the voice memos. This excludes common words like: I, him, that, this, and so on.



Figure 8: A word cloud of the top 11 words mentioned in voice memos.

Books and library are quite representative because these were among the most often chosen places. The word “remember” was insightful because this methodology did cause many people to say, “I remember when...” which means that people were talking about their memories and how their perception of place was influenced by those memories.

Below is another word cloud that looks at all the adjectives that were mentioned two or more times.

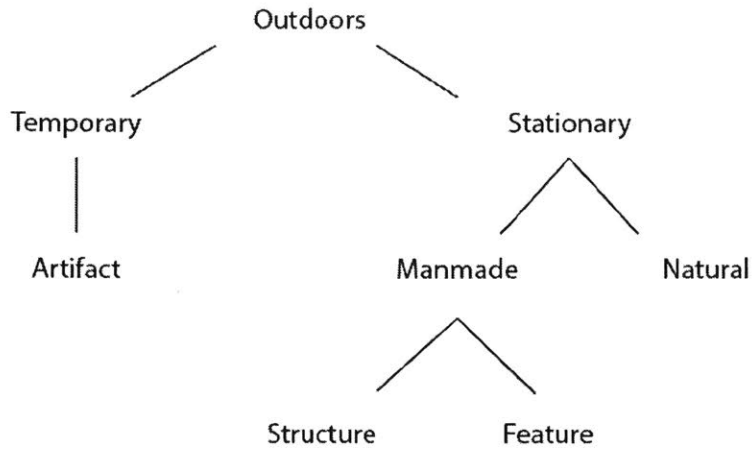


Figure 10: Classification of Outdoor Places that were chosen in the Harvard Square Pilot Study.

To explain the above figure, places were either temporary or stationary. Temporary refers to things like food trucks or art in public spaces. A temporary artifact refers to an object in the environment like a Tesla Car, which one participant saw and noted really inspired him.

Stationary refers to establishments and parks. Manmade structures refer to churches for example and to plazas, while manmade features refer to telephone poles, for example. Natural refers here to the river, or trees, or parks. Although parks is debatable, because sometimes there are manmade features in the parks, most people refer to the parks as the greenery, and for that reason I will count it as natural.

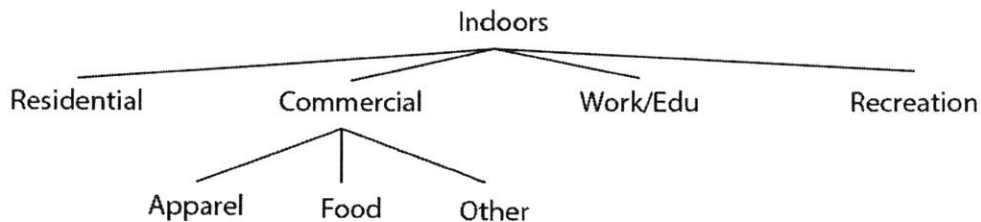


Figure 11: Classification of Indoor Places that were chosen in the Harvard Square Pilot Study.

To explain the above figure, indoor residential refers to homes and apartments, commercial to establishments that are further broken up into apparel, food (which includes restaurants, cafes, and bars), and other. Work and education refer to the inside of Harvard University buildings or professional buildings. Recreation refers to places like the gym.

I placed each of the 70 locations into the categories from the classification, and here are two charts that represent the most chosen locations.

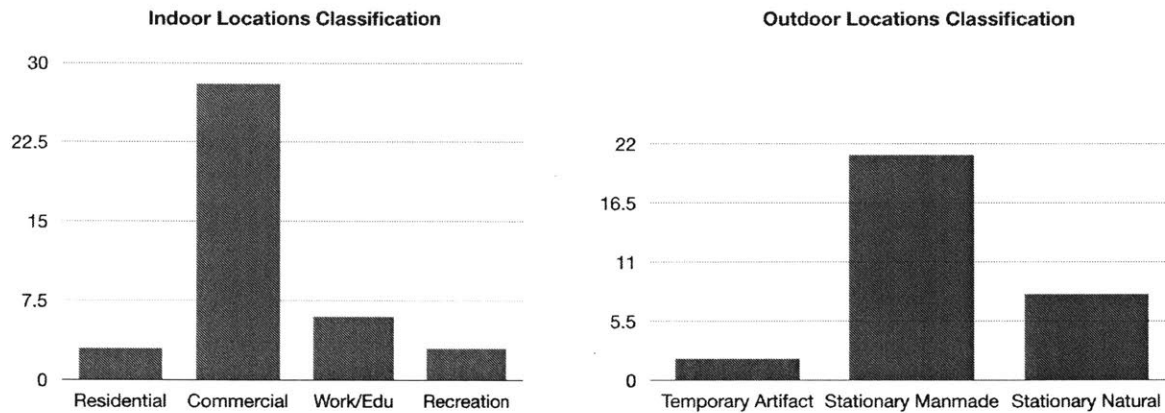


Chart 1: The breakup of the numbers of indoor locations and outdoor locations that were chosen in the Harvard Square Pilot Study Phase 1.

Indoor Commercial locations and Outdoor Stationary Manmade locations were most often chosen. There were more indoor locations identified overall than outdoor locations.

How People Reflected on Places

There were three ways in which people reflected on places in their voice recordings.

1. Sensory details (in the moment and consistently)

Places like Lush, for example, were chosen and described for their and by their very clear sensory details. Lush, consistently, was said to be colorful, smell nice, and allow for touching and exploration of products.

2. Memory

Other places were chosen for specific events or memories that happened. Usually these memories were fun or important or strange in some way.

3. People Associated

Other places were chosen for being associated with specific people or specific conversations.

The Coop vs Harvard Bookstore:

Most people chose the Harvard Bookstore as opposed to the Coop. When asked why, people said it was because the Coop felt like either a touristy place or a Harvard-branded place whereas the Harvard Bookstore had more of a local feel, which they felt was important for authenticity and feeling comfortable.

Lush and Black Ink

These two places were among the most chosen indoor establishments. The commonality between the two is that they allow for exploration of products and allow for people to tangibly touch and play with the variety of objects. Lush was only chosen by females—it is a cosmetic store.

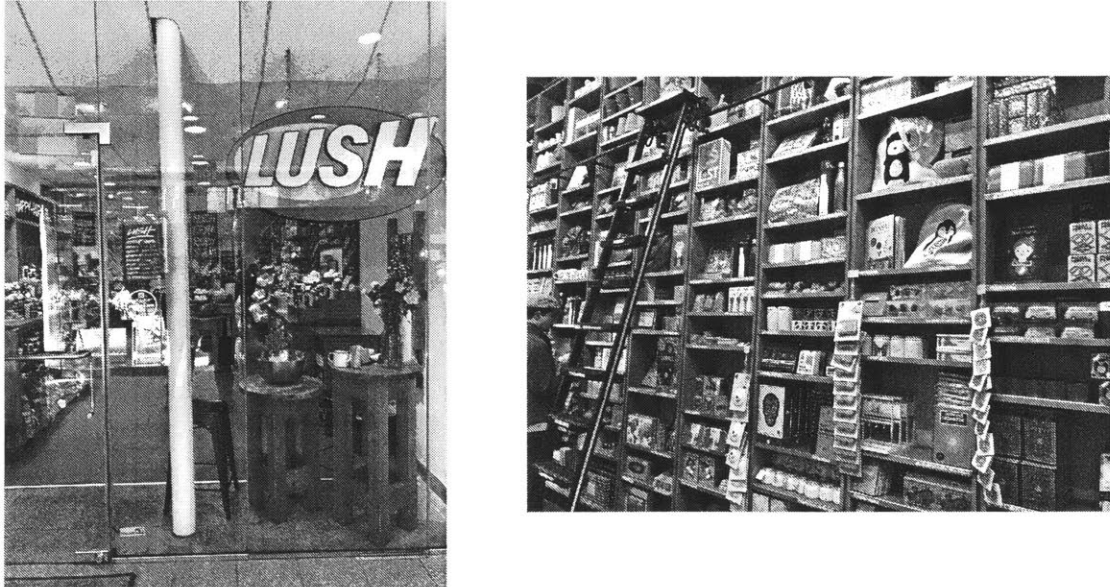


Figure 12: Participant taken pictures of Lush (left) and Black Ink (right).

Harvard Square T Station



Figure 13: Participant taken photo of the Harvard Square T Station.

The children who participated in the experiment chose the Harvard T Station as one of their playful places. This is because for them, the T represents the freedom to travel and go to new places to hang out with their friends.

In the words of one of the children: “Harvard T stop is a very inspiring place because it’s a place that me and my friends always have wild conversations and a place that we associate with fun and exploration”.

One girl talked about how the T system is what caused her to start liking Cambridge a lot, because public transportation in Cambridge allows for children like her to safely travel to Harvard Square or Central Square with her friends, whereas in other states like Texas, where she had visited before, there is no good public transportation.

Most adults did not choose the T station; for them, the T is a way to get to work or school or home. It is merely a method of transportation.

4.3 Harvard Square Pilot Study Phase 2

In the second phase, the participant is introduced to Cubey, a blue Polaroid Cube camera. The participant is asked to come up with a back story for Cubey and asked to take Cubey to five places in Harvard Square that fit that back story. They are asked to take a picture of Cubey doing an activity in each of the five places. Cubey’s only truth that is provided is that Cubey has never been to Harvard Square. The participant’s story is recorded by me as it is told.

The idea behind this study was to try and see how people would see Harvard Square through the lens of an agent that has never been there before, to understand the salient features of Harvard Square and to see what (if any) biases people would attach to their decision of what Cubey was.

Phase 2 General Thoughts

Most people decided Cubey is a ‘he’ and also gave Cubey the backstory of being a tourist. Harvard buildings were commonly chosen as part of this phase, because participants felt that it was important for Cubey, who has never been to Harvard Square, to visit Harvard itself.

Cubey was also placed on many bicycles, and participants explained that Cambridge is a biking city, and that there are many avid bikers, so it is only fair for Cubey to experience this cultural aspect of the city. Cubey also tried many sweets such as ice cream and chocolate; Cubey was more often than not hungry at some point.

An interesting aspect of this phase was that the participants used Cubey as an excuse to explore and go into stores they personally had always wanted to, or take a silly picture they have always wanted to.

Overall, people really were fond of Cubey and came up with cool backstories that were made up on the spot. They all took to Cubey very well and were sad to give Cubey back to me at the end. Here are some transcripts of stories and locations for Cubey.

Gangster Cubey

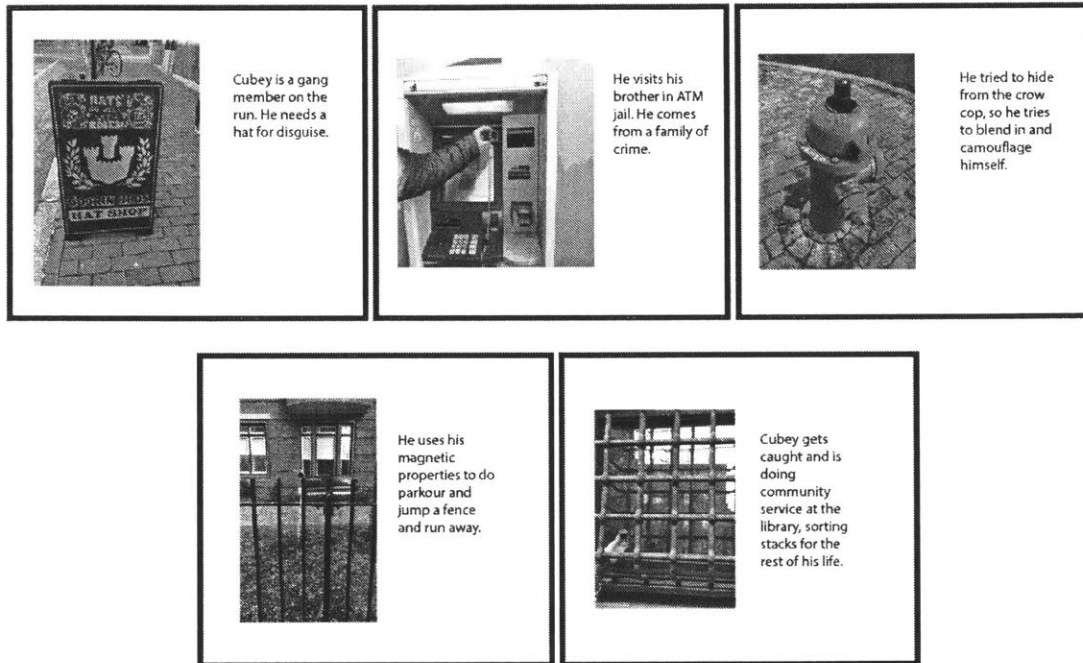


Figure 14: Sample narrative from one of the participants who decided Cubey was a Gangster.

College Student Cubey

In the image below, Cubey is a boy who has been admitted to Harvard for undergrad. He is in his first days of college and in this photo, he is staring at a reflection of himself in Harvard Yard and contemplating his academic and personal life path.

The continuation of the story used features of Harvard's campus. The participant took a picture of Cubey in front of the window of one of the dorm rooms, and explained that that room was Cubey's. (For privacy reasons I have not included that photo here).

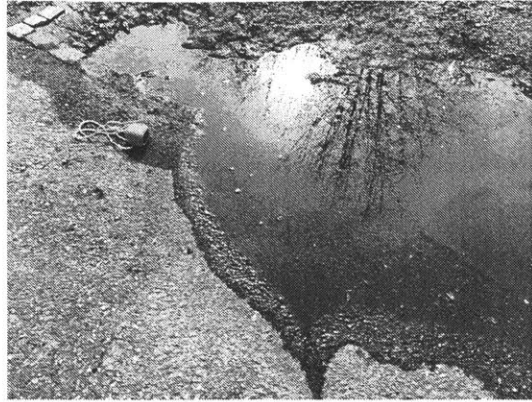


Figure 15: Participant taken photo depicting Cubey as a college student.

Explorative Cubey

In the picture below, Cubey is a girl who feels like trying new things and exploring. She decides to get a tattoo. When asked what type of tattoo, the participant responded: “A Cubey Crossing Sign”.

In the rest of the narrative, Cubey goes to a poetry bookstore, to a Audio/Video shop, even a bar to get drunk.



Figure 16: Participant taken photo depicting Cubey as a girl who goes to get a tattoo.

Overall, Cubey was a cool way of garnering places that people want to explore, or personally associate with certain thoughts because they could project onto a 3rd person object and seemingly remove the associations from their own selves.

Usage of Cubey

People came up with one of three types of narratives for Cubey.

1. Tourist/Friend

This was the most common narrative. Cubey was either a tourist or a good friend who hasn't visited the participant in a long time. In these cases, participants tended to choose aspects of the Square they found the most "touristy" or "representative". Harvard Buildings, Harvard Yard, or really great dessert and food places were often chosen for this narrative.

2. Random Character with a random backstory

Another way in which participants represented Cubey was to give him characteristics or a background that seemed random but played off his features. For example, some people took into account that he was a camera and said that he was sent from camera land to spy on humans and understand human life. One person took into account his magnetic property and used that in a clever way to show Cubey on the run as a criminal, hopping over a gate. Another person thought about the blue cube aesthetic and said Cubey was an ice cube and wanted to find cold places so the ice cube wouldn't melt. Though sometimes the results were very random and very in the moment and spontaneous, it was interesting to see how people used the features of spaces around them to build their stories. Additionally, this is an interesting way to start building out features in general that do stand out to people in a place.

3. Projecting personality/desires onto Cubey

The third way people used Cubey, was as a representation of their own desires or wants or moods at the time of the study. Several people were hungry at the time of the study, and so they took Cubey to either restaurants or dessert places. When asked why, people would respond along the lines of "I'm hungry so Cubey is hungry, too." Other people used Cubey as a way to explore places they had always wanted to go into. For example, one participant wanted to go to Warby Parker and Black Ink, but never had the time or reason to, and she used this opportunity with Cubey to go inside and check out both places.

Outstanding Places for Cubey

Overall, there were 76 places chosen for Cubey across the participants. Of these 76 places, here is a table with the five most chosen places.

Place	Number of People Who Chose Place
Bike	5
Corner Outside Felipe's and Crema Cafe	3
Black Ink	2
Coop	2
LA Burdicks	2

Table 4: Most Often Chosen Places for Cubey.

John Harvard Statue, the T Station, the food area in the park outside Pete's, Postcards in front of random stores, and a tree were also chosen 2 times each.

The most common place for Cubey to have a picture snapped was on a bike. This detail is quite representative of the fact that Boston and Cambridge are biking cities. Most participants said because Cubey was in Cambridge, Cubey had to experience being on a bike. What was interesting, too, was that many of the people who chose the bike actually weren't bikers themselves, but still felt that it was a quintessential Cambridge element.

Another common place for Cubey was the Brattle Square corner, right outside Felipe's and Crema Cafe. People either chose the corner itself or establishments near the corner because the area is a busy place surrounded by people and filled with musicians and singers and good food.

Another common location was Harvard: people would either choose Harvard buildings or open spaces that are a part of Harvard.

Another interesting aspect of the Cubey results is that people tended to be more spontaneous and feature-driven in their pictures. As they walked, they would notice things in the environment and use those as a way to structure their narratives.

The Quirk of Harvard Square

It's important to consider the fact that Harvard Square is uniquely surrounding and surrounded by the higher education institution, Harvard. Many other cities will not have this unique element to deal with, which is why in the ontology breakdown, Harvard buildings are not treated separately, although there was a clear difference in when people chose to go to Harvard buildings (namely for Cubey as tourist, or if they were students at Harvard and had strong memories relating to the classrooms or dorms). Another thing to consider is that Harvard Square is inevitably a tourist hotspot. People tended to have some sort of inclination towards touristy places, if only for the sake of trying to represent Harvard Square in a friendly, accurate way.

Benefits of Cubey

Using Cubey allowed participants to reflect on their **culture** and **background**. Participants, by associating their responses to a third person object as opposed to directly reflecting on themselves, unknowingly revealed some of their biases about places that had stemmed from their culture and background. Essentially, using Cubey allowed many participants to focus on the most salient features of Harvard Square.

5

Lessons & Takeaways

In this section, I will briefly talk about lessons that I learned from the three pilot studies, as well as general limitations in conducting the studies.

Limitations Surrounding Children

Middle school children were originally chosen as the age group to represent “kids” in this pilot study because they are old enough to start having cell phones and start getting permission to go to Harvard Square themselves and use the T with friends. Thus, they would be able to form their own opinions and ideas of a space away and apart from the influence of their parents. The concept held with the participants when they were interviewed and asked about middle school children lifestyles. Unfortunately, middle school children are also a much harder age range to schedule for this type of field experiment because they are extremely busy: they have school on the weekdays and usually have after school activities or tests to study for. On weekends, too, they might have plans with friends or competitions or prior engagements. Additionally, middle schoolers needed their parents to drop them off in Harvard Square or Kendall Square if they weren’t coming with a group of friends, so they are, quite reasonably so, dependent on their parents’ schedule as well. This type of field study therefore lacks scalability when it comes to middle schoolers. However, this age group does get to the Square and other places with friends once in a while, so we were still able to collect data from them about their impression of places.

Lessons from the Pilot Studies

The Harvard Square and Kendall Square Pilot studies were both labor intensive. They required me, a researcher, to ask participants to come outside in both the cold weather and in thankfully warmer weather and walk around for anywhere from 30 minutes to about an hour. Many people chose circuitous paths, so there was a lot of walking, and a lot of conversation. The process was often insightful as while walking from one place to another, people would share their own impressions of places around the vicinity and would frequently compare Cambridge to other cities they might have visited or lived in. A major problem with such a study is that there might be a bias based on the time of day, the weather that day, the people around, even attributes of the researcher and how comfortable the participant feels with the researcher. Although the benefit of such a study is that it does get at more intangible qualities of a city in a somewhat more natural way, it is still dependent on many factors and is not scalable for short periods of time. It may work in a larger context where a series of researchers are tasked with walking around day by day with a series of say 10 participants per day, but it is still labor and time intensive.

Another problem with such a study is that the time of day plays a key role. People who work a 9-5 job and younger students (elementary through high school and younger kids) typically can only do the study either in the evening or during weekends. Kids are even harder to schedule because they often have extracurriculars after school and exams and other things to study for and then might have competitions or plans to hang out with friends during the weekend. So realistically, the evenings or weekends are best for people to schedule the experiment, and that poses a challenge for scalability. In essence, the labor intensive process

reveals a lot of cool insights (the conversation with the researcher is a great way of getting a more natural explanation of places to visit because the participant feels, more often than not, as if they are giving a tour to one of their own friends or visitors). But there needs to be an easier way of scaling up.

The analysis was also time intensive. In the Kendall Square Pilot Study, many of the pictures participants took needed to be examined manually by me. As mentioned earlier, the zoomed in pictures were relatively clear to understand, but still needed to be classified by an observer. The zoomed out pictures needed the tagging from the participant to make sense. All the pictures needed to be tagged in order to compare and contrast and understand the features that were chosen in the eight places. This is especially important if we were to scale the Kendall Square Study up and theoretically wanted a machine learning model to identify, classify, and extract common features in the pictures based on the words. Each picture would need to be accurately tagged by the researchers, and that takes a lot of time.

In the Harvard Square Pilot Study, the voice recordings were practical and easy for participants in the moment, but transcribing the voice recordings later on proved to take a lot of time. Voice transcription software could not properly understand the accents of many of the participants, so I hand-transcribed all the voice memos. I asked one participant to use the microphone feature on the iPhone, but he had to stop every few seconds to check that the right words were being transcribed, and this interrupted the flow of the voice memo. For another participant, his accent was completely misunderstood.

The Harvard Square Pilot Study also required me, the researcher, to make classifications of the types of places that were chosen by the participants. All these classifications are necessary if we want to potentially feed this information to machine learning models to start to dissect features of the places and verbal features in the voice memos.

Takeaway

One important takeaway from the three studies is that a combination of the studies provides and elicits details and features related to the four concepts (mentioned earlier) when thinking about human perception of the city. These four things, **memory**, **culture/background**, **state of mind/mood**, and **social interactions** are intangibles that are highly relevant and important, and there isn't much work being done to uncover these intangibles.

The Kendall Square Study was able to elicit responses related to state of mind and mood and culture and background. The Harvard Square Study Phase 1 elicited responses related to memory, culture/background, and social interactions. And lastly, the Harvard Square Study Phase 2 (Cubey Study), was able to elicit responses related to memories, state of mind/mood, and social interactions. Coming up with a methodology that combines the three studies in some way could be key in making scalable studies that could start to truly capture subjective impressions of spaces.

6

Extending the Pilot Studies

Thinking about larger, scalable studies

One of the goals of these pilot studies was to help inform larger, scalable studies. Here, I will go through a series of potential studies that can be conducted in any location, and then detail one specific potential study.

If we want to keep the conversation with the researcher as a part of the study, then we can use a tool like Google Maps which allows us to zoom in to street level and see the storefronts.

Google Maps Study (1)

Researcher sits with participant, Google Maps open on the browser. Researcher asks the same question: show me five places in Harvard Square (or whatever location the researcher hopes to study) you find creative, inspirational, or playful, and tell me why? Participant would take the researcher on a trip using the mouse and Google Maps and zoom to particular areas they found the most creative, inspirational, or playful.

Any question could be asked in this setup and the participant would still be taking the researcher on a “trip”, albeit a “virtual” trip, so the conversation element remains as does the “visitor” sentiment.

This method was tested with two participants who took me on a virtual trip through Harvard Square. The protocol only took about 10 minutes per participant and both were able to come up with places quickly and orient themselves according to Google Maps. Neither participant used the street view, interestingly enough, preferring to stay on the general, 2D map version that shows up when Google Maps is opened.

This method seemed to be a step in the right direction for scalability, but it still requires a researcher to sit with a participant which remains labor and time intensive in terms of scheduling. In the next study, we will remove the researcher’s presence in the study.

Google Maps Study (2)

Instead of having a researcher sit with the participant, it could be a completely virtual set up where there would be a web app using Google Maps that asks the question and lets a person flag and pin certain locations and explain why.

This is a very simple and replicable study, but it does lose the conversational element. However, it does provide a quicker, virtual way of getting information about what places people find creative, inspirational, or playful. People can answer the question from anywhere.

We can strip away even more.

Study (3)

Instead of using Google Maps, we can simply ask the question in a survey format using Qualtrics.

What are 5 places in your [neighborhood] that you find creative, inspirational, or playful, and why in a sentence or two?

This would be the simplest. It completely gets rid of the conversational element and the physical aspect, but it will start to provide answers in a mass-way. And people can answer it whenever, wherever, and easily.

It would be interesting to see if people choose the same places as if they were in the place itself and exploring with someone else.

Study (4)

Instead of asking the participants to submit places or images, an alternative study could present the participants with a series of images aggregated from Twitter and Instagram tagged with certain mood-related words such as “happy” “sad” “boring” and ask the participant what they would describe the mood of the picture as. Once participants have answered with their own tags, the original tags and the participant tags would be compared and contrasted to see if people are in consensus about the mood of places from the features in the pictures.

Study (5)

Another potential study could be to provide participants with images of places, again from Twitter and Instagram, ask them what word describes the mood of the location, and then ask them: “the addition or subtraction of what feature would change the mood into [x]”. Here, [x] means whatever mood the researcher is interested in. For example, an image of the Corner outside Felipe’s, where street musicians are playing is shown to a participant. The participant describes the mood as “lively”. The researcher then asks the participant, “the addition or subtraction of what feature would change the mood from lively to boring”. The participant might answer, “the subtraction of the street musicians would change the mood to boring.” This study would be trying to identify what features in a scene or location are impacting the perception of mood of the place.

Combining Aspects of the Studies

These studies should all be conducted, with one place in mind, like Harvard Square. Then, researchers should see if similar or the same places were chosen across the methodologies. The first study has a social aspect to it, while the other two studies are done alone. Would the first study result in places and reasonings that are more social in nature, and would the other two studies result in places and reasonings that are more personal and contemplative in nature?

Once a statistically significant sample size has completed these studies, the researcher can start to make broader conclusions about the features of places that are creative, playful, and inspirational, across ages and backgrounds.

Detailed Future Study

One location will be chosen, in order to get an aggregate of responses from hundreds of people in order to be able to make statistically significant conclusions. In this case, the location will be Harvard Square, because it is a work place, it is a place of education, it is a hang out place, and it is a tourism place.

A minimum of 500 participants will be recruited for this study. These participants will be across ages, across gender, and across nationality. In the recruitment, Harvard undergrads and

grads will be reached out to, as will children in the area (from schools like Cambridge Rindge and Latin), as will people who work in establishments in the area, as will elderly citizens who are in senior homes nearby, as will people who live in residential areas in the Harvard Square area.

Once a mix of these people have been chosen to participate, they will be sent a link to an online web app that will be made by the researchers.

This web app will use Google Maps API to display a Google Map version of Harvard Square in the main landing page of the web app. Participants will be told the motivation of the study and will be asked a series of questions that they have to complete. The overall study should take less than 30 minutes.

The first question that will appear will be: “What are five places in Harvard Square you find to be creative, inspirational, and/or playful? Pin these locations on the map and tell us why.” Participants will be allowed to do a voice recording or a typed response.

Once they have completed this section, a second question will pop up: “Now you are in Harvard Square with someone you’ve just met who has never been here before. Take this person to five places you enjoy, and explain why you chose these places. As in the previous question, pin these locations on the map.”

Once they have completed this section, a third section will appear. This section will randomly show 10 establishments in Harvard Square (the establishments will be selected via a random generator running in the background of the web app, so for example, Felipe’s, Memorial Church, Harvard Bookstore, Petali, Lush, Crema Cafe, Brattle Square Theater, Harvard Graduate School of Education, Cambridge Common Park, and Harvard Yard would be ten potential locations). As each location is shown, the same question will be asked in a multiple choice format: “Who would you most likely take to this location: (a) family member (b) friend (c) colleague (d) public figure (for example, celebrity or president) (e) boss/professor (f) tourist (g) interviewer?” Option (g) is to see what places people seem to think represent them well in the context of an interview.

Seeing which people participants choose for which locations would start to reveal insights about the impressions participants have of the usage of places.

Once participants have finished this section, there will be one last section. In this fourth and final section, participants will be shown five user generated images of Harvard Square from Instagram and Twitter that have mood related words in the hashtags (for example, a picture of a sunny day in Harvard Yard with the #peaceful), and will be asked to give one hashtag that represents the mood of the image. These hashtags will be compared with the original Instagram or Twitter caption, to see if people have a similar sense of mood based on an image of a place.

The responses from all of these sections will be aggregated and compared and analyzed to see if people across ages choose similar locations and similar responses or if there really is a variety of responses based on gender, background, and age. The responses in the first two sections will look at the actual written/verbalized responses to see what qualitative reasonings come out in the selection of places.

Ultimately, this scalable study would attempt to dissect the perception of a place like Harvard Square from multiple angles.

Conclusion

The goal of this series of pilot studies in Kendall Square and Harvard Square was to explore potential methodologies for eliciting intangible qualities of spaces and cities, to understand the essential qualities of space. The studies examined the responses of people across ages, from children to adults to the elderly.

Many lessons were learned from interacting with parents and middle school children. In the future, designing methodologies that rely on physical exploration of spaces with a researcher, the researcher will have to take into account the general patterns and business of middle school children. Children are dependent on their parents for their weekday schedules which might include after school activities and other extracurriculars. Additionally, children are dependent on their friends if they do get permission to explore places without parental supervision. Keeping in mind that children travel with other children, thus making city exploration a social fact, will be useful for the design of future studies. Taking advantage of the social aspect of children's engagement with the city could provide more of a collective understanding of how children interact and perceive the city around them.

The Kendall Square Pilot Study, which had people take pictures of features in eight pre-determined locations of eight pre-determined words revealed snippets of what people thought of a location that is mainly work-buildings and is hardly visited by children. It also provided a basis for understanding why pictures alone of features are not enough to explain the reasons of people for associating certain words with certain establishments or features. A combination of explanations from the participant and a photo provide a more holistic view of outstanding features in an environment.

Informed by the thoughts of Kevin Lynch, William Whyte, and Stanley Milgram, to name a few, the Harvard Square Pilot Studies sought to grasp at the creative, inspirational, and playful 'image of the city' in a natural setting. People perceive the city in their own subjective ways, influenced by memory, conversations, other people, and features in the environment as well. While people also have their own interpretations of the words "creative", "inspirational", and "playful", the study attempted to see if people would converge on similar themes of what each word meant in the context of space and place, and if people would also converge on similar places in Harvard Square. The fact that the participants walked through Harvard Square, the location in question, with me, the researcher, was positive in the fact that it allowed for a more natural flow of conversation and explanation to occur. Although labor-intensive, the preliminary feedback showed that strong subjective information can be gathered in this way through being in a physical space and examining it in the presence of another.

Phase 2 of the Harvard Square Pilot Study introduced an object like Cubey, the Polaroid Camera, a third person agent that could reflect the desires, wishes, or perspectives and playfulness of the participants. Every single participant expressed how attached they were to Cubey after the experiment, and most participants explored or played with Cubey in some way or another while walking in the environment of the Square. The introduction of a third person agent in order to garner more thoughts about how people are biased when they think about places or features that other groups or populations would like (such as tourists or extended family members) seems to be a viable possibility for future studies.

The places that were more often 'voted upon' or chosen in the Harvard Square experiments included Lush, the Harvard Bookstore, and the corner by Felipe's/establishments in that area. The commonality between these places is that they invite exploration and lingering,

provide a change of pace or scene or people, and can be visited by anyone. The places or features that were chosen more often for Cubey were bikes (which represented in the responses of people that they strongly consider Cambridge and Boston to be biking cities), and Harvard buildings (which represented in the responses of people that Harvard Square is entwined deeply with Harvard University). Even with a small sample of people, common places and explanations started to appear. Future, larger scale studies will provide statistically significant votes of places with words and reasons that explain subjective thoughts of people across ages and gender and background. A combination of the words and sentiments and locations and potentially pictures as well will help when researchers, scientists, and urban planners continue to try and build spaces that are for all people.

While in City Science, CityScope provides a tangible way of representing the flow of agents through cities and how changes in the external features of that city impact that flow, the complexity of individuals' paths and motivations is lacking.

My thesis explored potential methodologies that could start to be the ground work for getting at the subjective, mental perceptions of city spaces. This ground work will hopefully pave the way for larger scale methodologies that will provide the qualitative, subjective data that can help build much more interesting simulations of the future.

Ultimately, the city and its spaces are perceived beyond vision and audition. Memory, prior experiences, company, biases, and other factors influence how spaces are perceived by people. While this thesis focused heavily on how people perceive places from a creative, inspirational, and playful lens, the methodologies explored in the actual studies as well as in the future work section could explore the city from any lens.

Eventually, such methodologies will allow for a more accurate representation of why people perceive places in certain ways and will allow for researchers to strip away at the purely subjective and personal opinions to understand the features or tangible qualities of a place that evoke certain emotions and experiences which then in turn inspire such perceptions.

Bibliography

- [1] Bentley, Frank, et al. "Drawing the City: Differing Perceptions of the Urban Environment." *Proceedings of the 2012 ACM Annual Conference on Human Factors in Computing Systems - CHI '12*, 2012, doi:10.1145/2207676.2208282.
- [2] Alexander, Christopher. *A Pattern Language: Towns, Buildings, Construction*. Oxford Univ. Press, 1977.
- [3] Lynch, Kenneth. *The Image of the City*. MIT Press, 1962.
- [4] Jacobs, Jane. *The Death and Life of Great American Cities*. 1964.
- [5] "William H. Whyte." *Project for Public Spaces*, 3 Jan. 2010, www.pps.org/article/wwhyte.
- [6] C. S. Lewis, "The Shoddy Lands" in *Of Other Worlds: Essays and Stories* (New York: Harcourt, Brace & World, 1966)
- [7] Tuan, Yi-fu. *Topophilia: a Study of Environmental Perception, Attitudes, and Values*. Columbia University Press, 1990.
- [8] Milgram, Stanley, and Thomas Blass. *The Individual in a Social World Essays and Experiments*. Pinter & Martin, 2010.
- [9] Felonneau, Marie-Line. "Love and Loathing of the City: Urbanophilia and Urbanophobia, Topological Identity and Perceived Incivilities." *Journal of Environmental Psychology*, vol. 24, no. 1, 2004, pp. 43–52., doi:10.1016/s0272-4944(03)00049-5.
- [10] Rollero, Chiara, and Norma De Piccoli. "Place Attachment, Identification and Environment Perception: An Empirical Study." *Journal of Environmental Psychology*, vol. 30, no. 2, 2010, pp. 198–205., doi:10.1016/j.jenvp.2009.12.003.
- [11] Holland, Caroline, et al. "Social Interactions in Urban Public Places." 2007, www.jrf.org.uk/sites/default/files/jrf/migrated/files/2017-interactions-public-places.pdf.
- [12] Lab, MIT Media. "Streetscore." *Streetscore.media.mit.edu*, streetscore.media.mit.edu/.
- [13] Valentine, Gill. "Angels and Devils: Moral Landscapes of Childhood." *Environment and Planning D: Society and Space*, vol. 14, no. 5, 1996, pp. 581–599., doi: 10.1068/d140581.

- [14] “When Kids Put on Their Urban Planner Hats – Cities Are Better for Everyone.” *URBAN HUB*, www.urban-hub.com/urbanization/when-children-design-cities/.
- [15] “Designer Profile - Aldo Van Eyck: A Playground for Every Neighborhood.” *Goric Marketing Group USA, Inc.*, 26 July 2017, goric.com/designer-profile-aldo-van-eyck-playground-every-neighborhood/.
- [16] Alarasi, Haifa, et al. “Children's Perception of Their City Centre: a Qualitative GIS Methodological Investigation in a Dutch City.” *Children's Geographies*, vol. 14, no. 4, 2015, pp. 437–452., doi:10.1080/14733285.2015.1103836.
- [17] Sepe, Marichela. *Planning and Place in the City: Mapping Place Identity*. Routledge, 2013.
- [18] Trommershauser, Julia, et al. *Sensory Cue Integration*. Oxford University Press, 2011.
- [19] Jeffery, K.j., and R. Hayman. “Plasticity of the Hippocampal Place Cell Representation.” *Reviews in the Neurosciences*, vol. 15, no. 5, 2004, doi:10.1515/revneuro.2004.15.5.309.
- [20] Nakazawa, Kazu, et al. “NMDA Receptors, Place Cells and Hippocampal Spatial Memory.” *Nature Reviews Neuroscience*, vol. 5, no. 5, 2004, pp. 361–372., doi: 10.1038/nrn1385.
- [21] Lee, Albert K., and Matthew A. Wilson. “Memory of Sequential Experience in the Hippocampus during Slow Wave Sleep.” *Neuron*, vol. 36, no. 6, 2002, pp. 1183–1194., doi:10.1016/s0896-6273(02)01096-6.
- [22] Lazzarini, Luca & López Baeza, Jesús. (2016). The Mushrooms' Lesson: Instagram as a tool to evaluate users' perception of urban transformations.