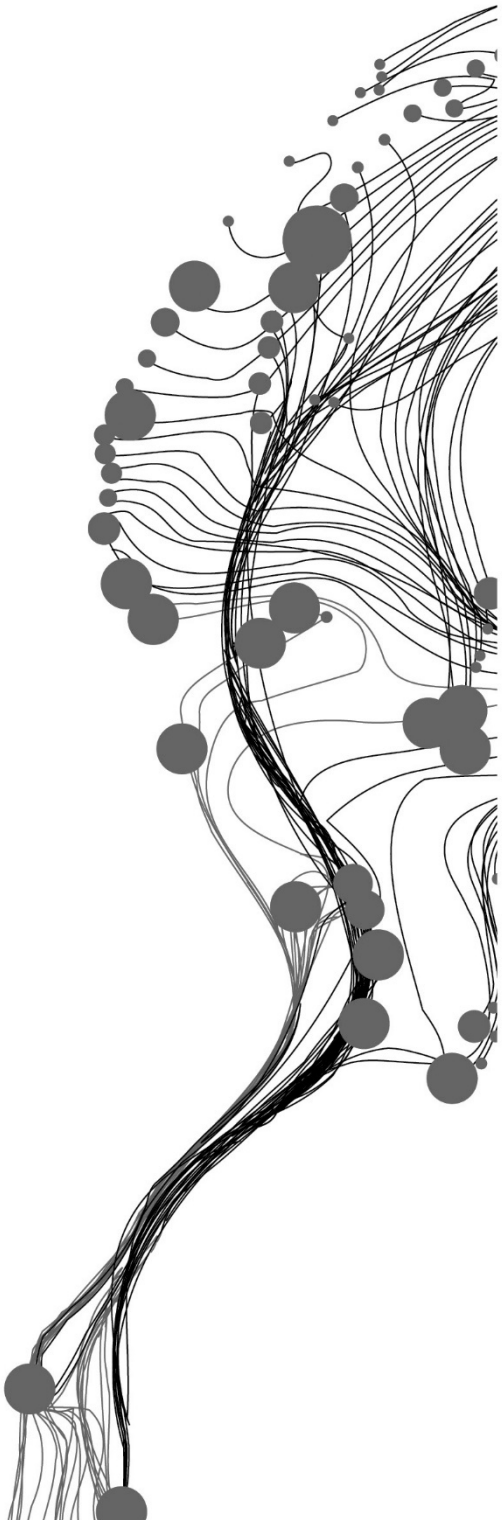

# Improving the cartographic visualization techniques of platial features – the example of London parks

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Enschede, The Netherlands. October 2020

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 degree of Master of Science in Geo-information Science and Earth Observation.
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# Cartography M.Sc.

**Improving the cartographic visualization techniques of platial features: the example of London parks.**

**Luke Harvey**

**2020**




## Statement of Authorship

**Herewith I declare that I am the sole author of the submitted Master's thesis entitled:**

**"Improving the cartographic visualization techniques of platial features – the example of London parks"**

**I have fully referenced the ideas and work of others, whether published or unpublished. Literal or analogous citations are clearly marked as such.**

**London, October 2020** **Luke Harvey**

# ABSTRACT

This study attempted to improve the cartographic visualisation of platial aspects. In recent years there has been an increase in platial studies but any cartographic depictions of platial aspects remain inadequate and often rely on supportive text. Using the increasing ties between cartography and art, techniques inspired by illustrative map makers were tested to determine their suitability to convey platial relationships. The study uses two parks in South West London where platial aspects were identified through park user interviews. The four identified platial aspects were discussed and attempts to improve their cartographic visualisations were made. Accurate park personas were created based on responses from the interviews, and map visualisations attempts were generated to represent their platial relationships. The visualisations ability to convey platial information was evaluated by an online survey with 75 responses. Results show that the line styling techniques were often associated with spatial relationships, but jagged lines have the most potential in depicting stress. Improvements to the temporal elements of a place ballet have been made, but other elements require further development. A hierarchy of radiating stress lines was established, and a subtle affordance icon layer can be used to define subregions and the affordances within them. The implications of these results are discussed.

**Keywords:** Place, place ballet, visualisation, atmosphere, sense of place, stress.

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# 1. INTRODUCTION

## 1.1 Context of Research

Maps have historically represented spatial relationships well (Kraak & Fabrikant, 2017; Mocnik and Fairbairn, 2018). However, this is not the case for platial relationships (Mocnik and Fairbairn, 2018). Studies that assess platial features, such as Seamon & Nordin (1980) and Eck & Pijpers (2017), richly describe these features through text to successfully communicate their complexities (Mocnik and Fairbairn, 2018). However, any accompanying maps in the studies struggle to convey platial information and retort back to representing spatial relationships, contributing little to the contexts of the studies.

This thesis touches on many current areas of academic research. Space and place theories are continually developing and contested terms (Cresswell, 2015; Nairn et al, 2016). Platial studies itself is a growing field with the first annual Platial Analysis Workshop being held in 2018 (Westerholt et al, 2018). In its second year, the workshop had a focus on its interdisciplinary nature (Mocnik & Westerholt, 2020). The strengthening ties of art and cartography have also been further developed this decade (Cartwright 2010; Bogucka, 2019). This study assesses how unorthodox and artistic approaches can be used to communicate platial information cartographically. As a result, the thesis will contribute to an interdisciplinary field made up of cartographers, human geographers, psychologists, illustrators, et cetera - anyone who wants to cartographically represent platial features.

## 1.2 Research Objectives (ROs)

The overarching research objective for this research is to develop new or apply existing, cartographic methods to better visualize the identity, atmosphere, and sense of place in mapped places. To tackle this research, it has been broken down into two sub-objectives for a navigable workflow.

**RO1: To identify the need for conveying platial aspects cartographically to do justice to the geographical concept of place**. This objective will lead to a concrete understanding of current place visualization attempts and techniques. This will then allow for a critical analysis of these attempts and the identification of aspects that are unsuccessful and need to be improved.

**RO2: To generate and understand cartographic means to better convey platial aspects**. This objective concerns the world of visual variables and dabble in experimental cartography to get an overview of which cartographic methods could be best used to visualize the identity of a place. Unorthodox methods or applications could potentially yield better visualization results than traditional ones. The slate is clean, and nothing is ruled out in the beginning.

A review of the proposed visualization methods will be undertaken. They will be assessed empirically to determine if they have succeeded in better communicating the sense of place. Why they have succeeded or failed will be examined to provide context improvements to the methods.

## 1.3 Research Questions (RQs) and Methods

To meet the objectives, they have been split into three research questions.

**RQ1: Which aspects related to place are important and would need to be better visualized?**

The identification of important aspects will allow the research to focus on a suitable, finite quantity of aspects where the visualization techniques can be improved. This will be achieved through a literature review. Examples of these geographic phenomena will then be identified in the two study locations. This will be done by interviews, following a similar technique by Eck & Pijpers (2017), and observation (Seamon & Nordin, 1980).

Specifically, my research aims to answer the following questions:

RQ1A: How does the sense of place change for a park user as they walk along their usual route?

RQ1B: What place ballets can be found in the two parks?

RQ1C: How does the atmosphere of the park change to users within its sub-regions?

RQ1D: How do the affordances of sub-regions in the park change for its users?

**RQ2: Which cartographic means can be employed to provide better visualization of the identified phenomena?**

The evaluation of existing cartographic means and whether they are suitable to better visualize aspects of geographic phenomena is the crux of the thesis. This question will be answered by the evaluation of current, more orthodox visualization techniques whilst also exploring more unorthodox methods. This question considers how point, line and polygon features can be utilized to communicate more context and display stronger identities of places.

These sub-questions will act as a focus during the study:

RQ2A: How can a line be styled along a walking route to convey the changing sense of place?

RQ2B: How can place ballets be depicted on a map with maximum detail?

RQ2C: To what extent can the map style communicate the atmospheres of sub-regions?

RQ2D: Which visual variables are best suited to convey the affordances of sub-regions in the park?

**RQ3 Do the new visualization techniques better communicate the sense and identity of a place? Why do they/do they not do this?**

The evaluation will determine how successful the research has been in improving the visualization techniques used to display aspects of place. An analysis of the proposed solutions for RQ2A–D will be undertaken through people's perceptions via an online survey. The survey will be generated via www.sosci.de. The survey results will be quantifiably evaluated using statistical tests, such as the Friedman test, to determine if there is any statistical significance to how the survey respondents respond to the different visualisations.

## 1.4 Contribution and Limitations

This body of work is intended for human geographers who would like to represent their research findings of place theory better visually. It is also intended to be beneficial to cartographers who would like their maps to better communicate the sense of place and complex identities of their subject areas. This work is not focusing on developing and extending place theory. It is also not conducted to reveal new geographic phenomena. It is about trying to better communicate the existing phenomena cartographically.

This research was undertaken during the COVID-19 pandemic. As a result, the pandemic provided limitations to the scope of this study. COVID-19 had three major impacts on the way the study was conducted. These are summarised in Table 1.1.

***Table 1.1*** *The main alterations to the study caused by COVID-19.*

| COVID-19 influenced changes and effects | Elaboration |
|---|---|
| **Study sites** | Initially, Jubilee Gardens in Central London was intended to be a study site for this research. Located next to the London Eye, it is popular with tourists and city workers. It was anticipated to have an interesting atmosphere of serenity amongst the bustle of the city, a place of respite for workers taking a break from the office and tourists orientating themselves in the city. It was believed to be rich comparison compared to the wilder, suburban Bushy Park (see Section 3.1). However, the UK Governments (2020) lockdown laws meant access to this park was not possible. An accessible, alternative park was chosen. Jubilee Gardens population and park habits would have also significantly changed during the pandemic with national and international travel reduced and a sharp rise of people telecommuting. |
| **Park habits changed** | Over half the interviewees in the study mentioned that their park habits have changed during the pandemic. Many were visiting the parks more often and mentioning that the suburban parks were becoming much busier. "*The atmosphere has changed because obviously with what's going on [lockdown restrictions]. It was a bit different before all of this was going on. It was a bit quieter*" remarked one interviewee. This was due to parks being one of the only remaining open public spaces (UK Government, 2020).<br><br>Interviewees also mentioned how platial features such as place ballets had been affected by the erosion of routine in their daily work schedule. "*[Currently] I am not in a set routine. When I am in a routine, I do tend to see the same thing every week at the same time so I guess certain faces.*"<br><br>Some interviewees used to be regular park users but during the study now avoid the parks or have found quieter alternative spaces as one interviewee put: "*I've walked in Bushy Park for twenty plus years but not at the moment because of the crowds of people.*" Some interviewees that |

| | |
|---|---|
| | still visited the parks have altered their usual routes and habits due to the crowds: "*I'm having to remap my routes all the time because I just can't [go in crowded areas] you know.*"<br><br>All these examples have demonstrated how the park as a place has changed during the COVID-19 pandemic and national lockdown. To get an impression of typical circumstances interviewees were asked to retell their experiences and habits in a pre-COVID environment however this may have led to the accidental omission of information as the interviewee is recalling their experiences from the past. |
| **Interview techniques** | Although legal, the interviewee's preferences – bar one – was to conduct the interview remotely. This changed the intended interview style from a similar observational interview where the interviewee would be followed on their usual route as used by Eck & Pijpers (2017). Instead audio and video call technologies were used. This led to the issue of an interviewee lacking the direct park triggers so they may have accidentally omitted information or romanticise positive park experiences when recalling from memory. Furthermore, articulation issues and misunderstandings may have been more prevalent due to the distanced communication (O'Conaill et al, 1993). |

## 1.5 Thesis Structure

**Introduction.** Opening with the context of the research, this chapter outlines the two research objectives of the thesis. It then digs deeper and establishes the research questions that need to be answered to fulfil the objectives. The chapter then assesses the contributions that the paper makes to its research field before acknowledging the limitations on the project that have prevented the research output from developing further.

**Literature Review.** The literature review introduces the notion of place and its interdisciplinary ties. The chapter then looks at how maps display platial features before exploring how maps themselves have developed different types of platial features. The review then closes on the strengthening of ties between art and cartography and how greater artistic influences could hold the key to better visualising platial features.

**Methodology.** This chapter concerns itself with how the research questions will be answered and the research objectives met. It introduces the two study sites and why they were chosen. The chapter proceeds further explaining the need to create realistic park personas and how this process was undertaken. This is followed by an explanation of the visualization developments taken to represent these personas according to the identified research questions and the evaluation techniques that will be used to test their effectiveness.

**Results.** A presentation of the results concerning the effectiveness of the developed visualisations in communicating platial features can be found here. This is achieved from the presentation of descriptive and inferential statistics.

**Discussion.** The results are put into context and what they contribute to the field of cartography is evaluated. The visualisation techniques are ranked and commented on their effectiveness in communicating platial features. Justifications as to why techniques were (un)successful are made.

**Conclusion.** This chapter ties up the research output by summarizing the key findings and how they have contributed to answering the research questions and meeting the research objectives.

# 2. LITERATURE REVIEW

This chapter describes the related work focusing on four main areas closest to this research. An introduction to place theory is made, as well as an explanation of place ballets, a feature this paper aims to improve the visualization of, is made. The following two subchapters discuss the roles maps have in displaying and developing platial features. Finally, the chapter focuses on the research that is trying to strengthen ties between art and cartography looks to see if the worlds of art and illustration can aid in the visualisation of platial features.

## 2.1. Place & Place Ballets

Place as a concept has been heavily discussed in human geography (Cresswell, 2015; Nairn et al, 2016). A place can be regarded as a space with meaning (Goodchild & Li, 2011), a location with an anthropogenic relation (Cresswell, 2015). It is a building block of human geography, but place theory is interdisciplinary in its attraction (Mocnik & Westerholt, 2020).

A place ballet is a term for a platial feature first coined by Seamon (1979) and developed in the early 1980s. It is the frequent unintentional convergence of routines in place (Seamon, 1980). The convergence of common routines between strangers such as waiting for the same bus every morning or walking past their home as they leave for work "generates a sense of friendliness and familiarity... [which] wouldn't be there if they were new faces each day" (Seamon, 1980, p. 159).

A pop-culture example of a place ballet is the opening scene of Paddington 2. Paddington Bear goes on his morning commute making all usual interactions with his neighbours. In one fluid motion he: joins a neighbour as she cycles by his front door; reminds another that they've again forgotten their keys; collects a daily newspaper while conducting routine small talk and then jumps on a new vehicle when their routes converge. These place ballets have been employed in the opening scene to generate a sense of place and close-knit community for the viewer. The only thing that Paddington narrates? "*I really feel at home in Windsor Gardens*" (Heyman & King, 2017, 03:44).

## 2.2. Maps Displaying Platial Features

### 2.2.1. Maps and Geography

Maps have historically and are presently employed when visually describing locations (Kraak & Fabrikant, 2017) because the Earth's surface and a map are both two-dimensional in structure. As a result, maps have strong capabilities to represent spatial relationships well (Kraak & Fabrikant, 2017; Mocnik and Fairbairn, 2018). This contrasts with platial relationships, which cannot be represented by a map in the same way. Maps have rather limited scope with respect to place (Mocnik and Fairbairn, 2018).

Maps and geography have a two-way relationship. Geography influences map as it covers an island, draws the rivers and locates the cities but a map can also influence geographies and society (Wood and Fels, 1992; Pickles, 1995; Monmonier, 2010; Aalbers, 2014). Aalbers (2014) demonstrates this two-way relationship through case studies of 'redlining' on maps where redlined areas have experienced a social decline. Here, the verb 'redlining' refers to the refusal of financial support due to living in a marked spatial zone with poor financial prospects (Aalbers, 2014). The term redlining itself has maps at its core as the word invokes the action of drawing red lines around the neighbourhoods thought of little financial prosperity.

### 2.2.2. Place Ballets

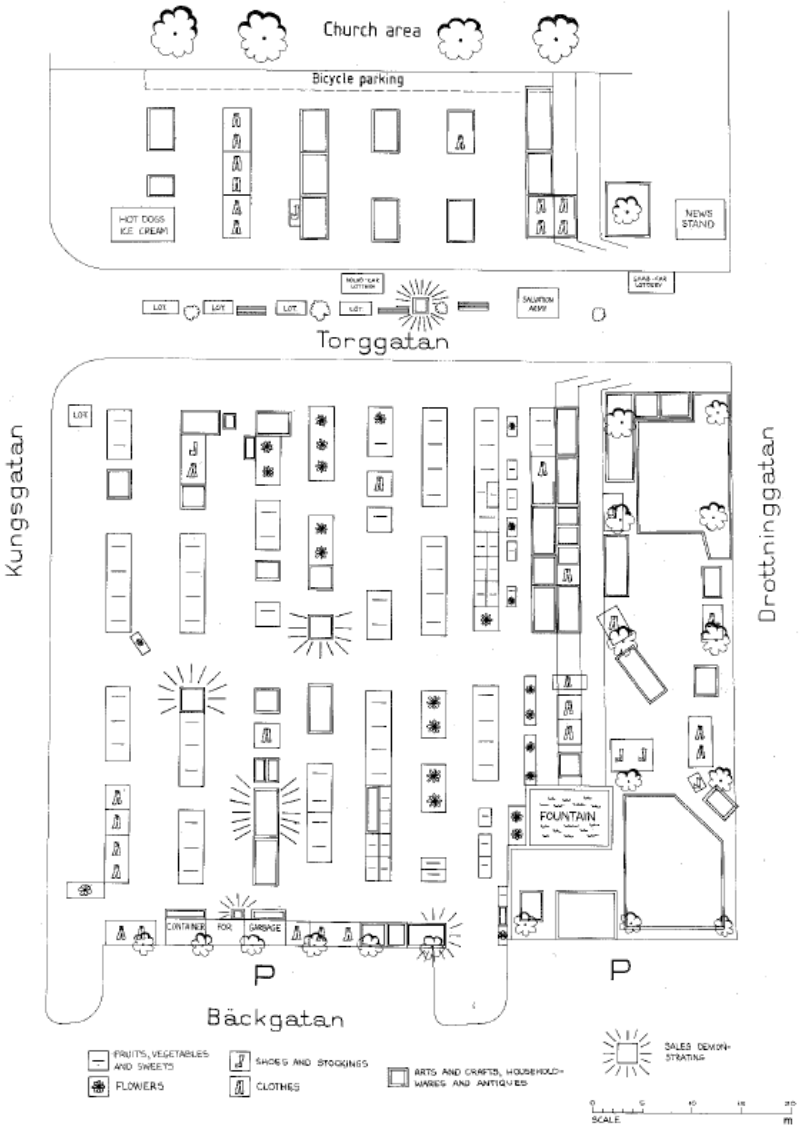



*Figure 2.1: Varberg Market (Sweden) as depicted by Seamon & Nordin (1980, p.37).*

Academic literature has examined place ballets in various contexts. Seamon & Nordin (1980) use the setting of a Swedish marketplace as they describe the many place ballets that can be found here. The paper contains a rich description of what is occurring in the market as a result of observations and

interviews with regular visitors to the market. It explains how slight changes to a place ballet, such as a market stall changing from its usual location, can lessen the sense of community (Seamon & Nordin, 1980). The paper then visualizes the market with a map (Figure 2.1). Unlike the rich text, the map does little to invoke a sense of place and struggles to communicate the place ballets, the focus of the paper, to the map reader. The map contributes little without the supporting text. The only visual indicator of the atmosphere is the lines radiating from select market stalls that are doing sales demonstrations. All other markings on the map, aside from the text and map symbols, represent physical items. The use of radiating lines appears arbitrary, they are not mentioned in the text. The two demonstrating stalls closest to the Bäckgatan have shorter radiating lines than the demonstrating stalls located in the centre of the market. The stall closest to Torggatan has a greater frequency of radiating lines compared to all other demonstrating stalls. The legend of the map does not explain these differences or what each of them represents. Do longer lines mean a louder demonstration? Do more frequent lines indicate a more captivating demonstration? From the map, we cannot tell.

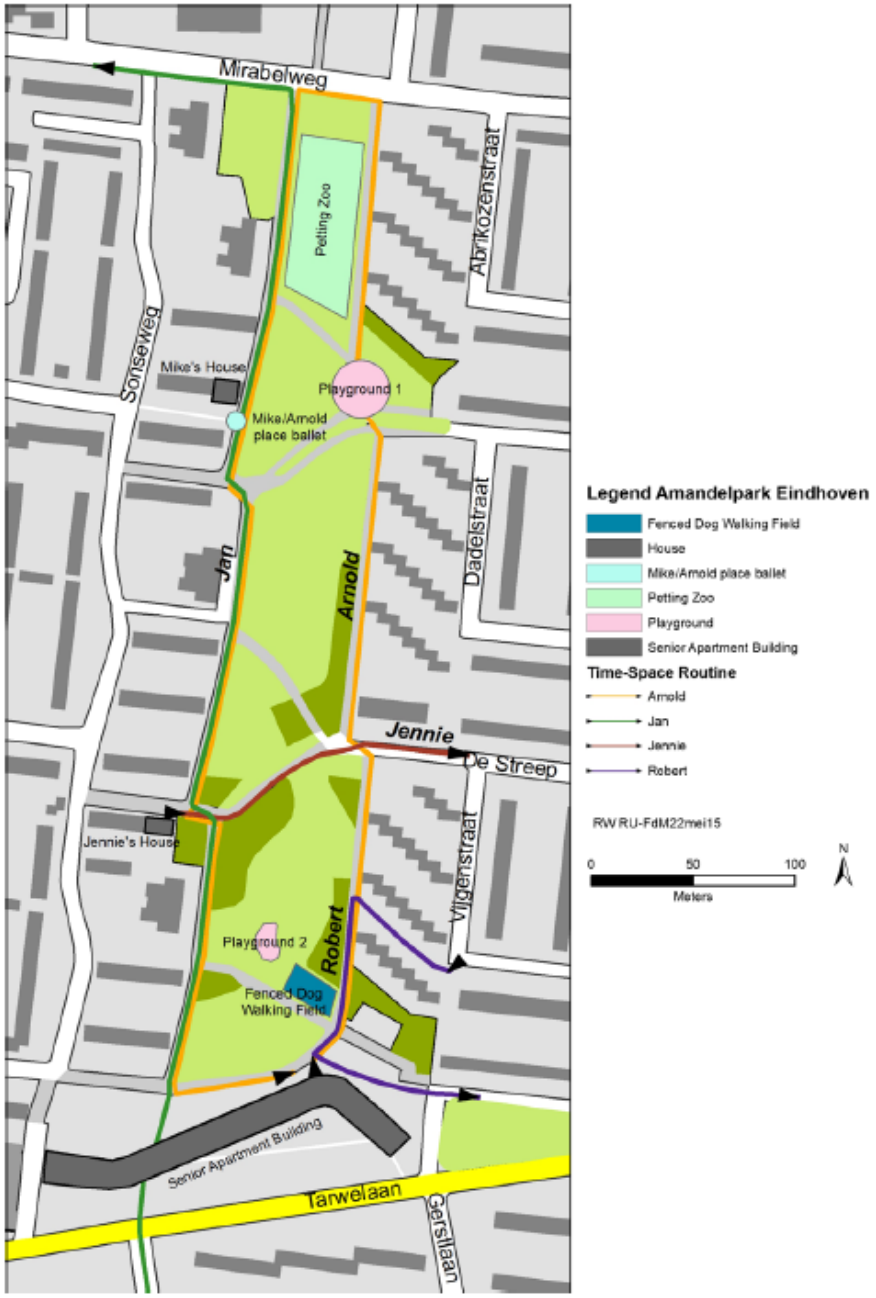



**Figure 2.2:** *Place ballets in Amandelpark, the Netherlands, as depicted by Eck & Pijper (2017, p.170).*

Eck & Pijpers (2017) studied place ballets in a park in Eindhoven, the Netherlands. Again, the paper describes complex relationships and patterns occurring in the park and how it has built a sense of community and identity. However, the accompanying map (Figure 2.2) again fails to represent these things other than simply locating them. The place ballet between Michael and Arnold is represented just by a green circle without any further explanation other than a label. The map fails to communicate what characterizes the place ballet and which activities happening at that place the place ballet is constituted by. The fields of cartography and geography will benefit from developed visualisation techniques of place ballets.

## 2.3 Maps Developing Platial Features

To develop the cartographic visualisation of platial features a good understanding of the core visualisation techniques for communicating information is needed. Bertin (1967) established the term 'visual variables' to refer to the different ways map elements can be graphically modified to encode information (Roth, 2017). The seven visual variables Bertin (1967) introduced are location, size, shape, orientation, colour hue, colour value and texture. These variables enable a mapmaker to communicate information about spatial and platial features. Certain associations to these visual variables can be made. For example, brighter colours are generally considered related to positive emotions and darker to more negative emotions (Hemphill, 1996). With the correct and creative application of the visual variables, maps can be better developed to communicate platial features.

Wood et al (2010, p36) describe that map symbols "are wholly conventional – essentially arbitrary – so that the connections between the signifieds and signifiers are, for all their taken-for-granted quality, never secure". This line of thinking allows the mapmaker to challenge the map readers' assumptions about the symbology of the map and the use of visual variables, something which can be used to communicate platial features which may be unorthodox in approach. The book You Are Here: Personal Geographies and Other Maps of the Imagination by Harmon (2004) follows this lead and curates' examples of personal and idiosyncratic cartographic work. It is another reminder that maps can break away from being mediums that merely locate items and display spatial relationships. Such maps make use of innovative and unorthodox visualization techniques to communicate stories, capture emotions and provide a sense of place (Harmon, 2004). Klettner (2019; 2020) explores how point map symbols can be more than location identifiers and connote idiosyncratic perceptions and feelings. Unorthodox and experimental techniques of mapmaking have, accordingly, the potential to communicate platial features (Powell, 2010). For the generation of new methods of cartographic visualisation, it is important to think outside of the traditional cartographic realm and be interdisciplinary in approach (Powell, 2010). Various aspects of place have commanded their own lines of research that are outlined in the following subchapters.

### 2.3.1 Place Ballets

To the best of the author's knowledge, there has been no research explicitly into visualising place ballets but tangents can be drawn from the following subsections of atmosphere and emotion.

### 2.3.2 Diversity Within a Place

Gröbe and Burghardt (2018) remark how most the visualisations of place are often an afterthought to platial research. To counter this, a study on how to visualise the diversity of places in a single location can be achieved quantitatively was undertaken. Four different visualisation techniques were carried out, all of which are traditionally cartographic in approach. As Gröbe and Burghardt (2018) conclude, each visualisation technique is best suited to a different scenario, but all of the map outputs still rely on supportive media and context. At first glance, the maps do not explicitly communicate platial information.

Keßler & Lotstein (2018) developed knowledge in which visual variables were best in displaying positional uncertainly visually. The study focused on two visual variables: symbol size, first introduced by Bertin (1967); and transparency, inducted as a visual variable by MacEachren (1995). Static and

animated maps were tested, with two different animation types used that are closely tied to symbol size and transparency (Keßler & Lotstein, 2018). Results were undertaken through an online questionnaire that was distributed via social media. The study also uncovers that in this case, static maps were preferred over animated maps (Keßler & Lotstein, 2018). The focus of this thesis will be displaying platial features on static maps.

### 2.3.3 Atmosphere

Text and dialogue can better communicate the atmosphere of a place when compared to maps (Mocnik & Fairbairn, 2018), because text tends to be more descriptive in nature and has better abilities to tap into emotions by immersing the reader into the place, making them feel like a character. Maps are stronger at describing the spatial relationships in a place but currently only offer limited methods of communicating the non-spatial relationships of a place (Mocnik & Fairbairn, 2018). Mocnik and Fairbairn (2018) used novel approaches to improve the cartographic representations of place by drawing on the strengths of literary works. This has been done through adding a timescale and non-spatial context to the visualizations. Another method is the inconsistent use of visual variables such as colour which opens the map up to a wider interpretation within storytelling. The study, however, concluded that maps are still less flexible and descriptive than text and that text is still better at communicating the atmosphere of a place (Mocnik and Fairbairn, 2018).

### 2.3.4 Emotion

Many studies have attempted to improve the techniques to visualise the emotion of a place cartographically by using different approaches (Hauthal & Burghardt, 2013; Burghardt et al, 2014; Poplin, 2017; Bogucka & Meng, 2019).

Maps have been used as a medium to deepen the understanding of emotional connections to place. Gardener et al (2019) did this through linking emotions to memories. The study asked participants to draw a mental map of a park from memory. From this, positive and negative area for each participant of the park could be identified. The mental maps are truly idiosyncratic. The participants then repeated the task for a second time whilst being in the park. The two outputs could then be compared to give a greater understanding of an individual's perception of place. The generated maps also acted as a facilitator for creative and artistic expression when describing a sense of place (Gardener et al, 2019).

A power place is an idiosyncratic, personal location where a person feels at ease and can 'recharge their batteries' (Poplin, 2017). In her study, Poplin (2017) mapped the locations of participants power places in two cities (Ames, Iowa, USA; and Hamburg, Germany). She was able to show that in most cases, the borders of the power places were unclear. The border of a place was in many cases even fuzzy due to the idiosyncratic nature of such places. This gives added complexity to the study as the various variants of a place experienced cannot be captured merely by longitude and latitude values. A place is rather made up of an arrangement of multiple physical items and many additional facets that can make the location a power place. Poplin (2017) has identified that power places are one of the many areas of uncertainty, or 'fuzziness' when mapping places rather than locations. On a large scale, however, the maps do give a good indication of the areas of Ames and Hamburg that sample population finds most relaxing.

Hauthal & Burghardt (2013) created an emotion map of the city of Dresden by analysing the emotional variance of the words in the metadata of geotagged photos on photo-sharing websites. The maps make use of isolines, which makes it possible to indicate how strong the experienced arousal or emotion is. These traditional cartographic methods employed rely on supportive media to inform the map reader that it is representing emotion. The map largely shows a generally positive feel around Dresden apart from a few negative splotches. Without any additional material or familiarity with the city, it is impossible to understand what is causing these localised emotions. This research has been developed by introducing a temporal dynamic (Burghardt et al, 2014) followed by a deeper linguistic understanding allowing for greater contextual understanding and scope for grammatical errors (Hauthal & Burghardt, 2016a). This study also discusses the idea of a single place representing multiple emotions (Hauthal & Burghardt, 2016a). This allows for instances of idiosyncratic events and experiences that can vary widely on the emotional spectrum. Instead of one map of Dresden, four maps are employed to show different sections of this spectrum. The new maps show a clear picture of emotion across Dresden and a better understanding of the places within it. Certain places are now identifiable and understood with more reasoning. However, the first impressions of the maps do not successfully communicate that these are emotion maps and they require supplementary map elements to provide this context. Hauthal & Burghardt (2016b) have again developed this further by separating the emotional contributions between tourists and residents whilst still using the four-map approach. These maps give an efficient overview of how separate groups of people feel towards a place, but they still employ traditional cartographic techniques and require supplementary information to provide the emotional context of the maps.

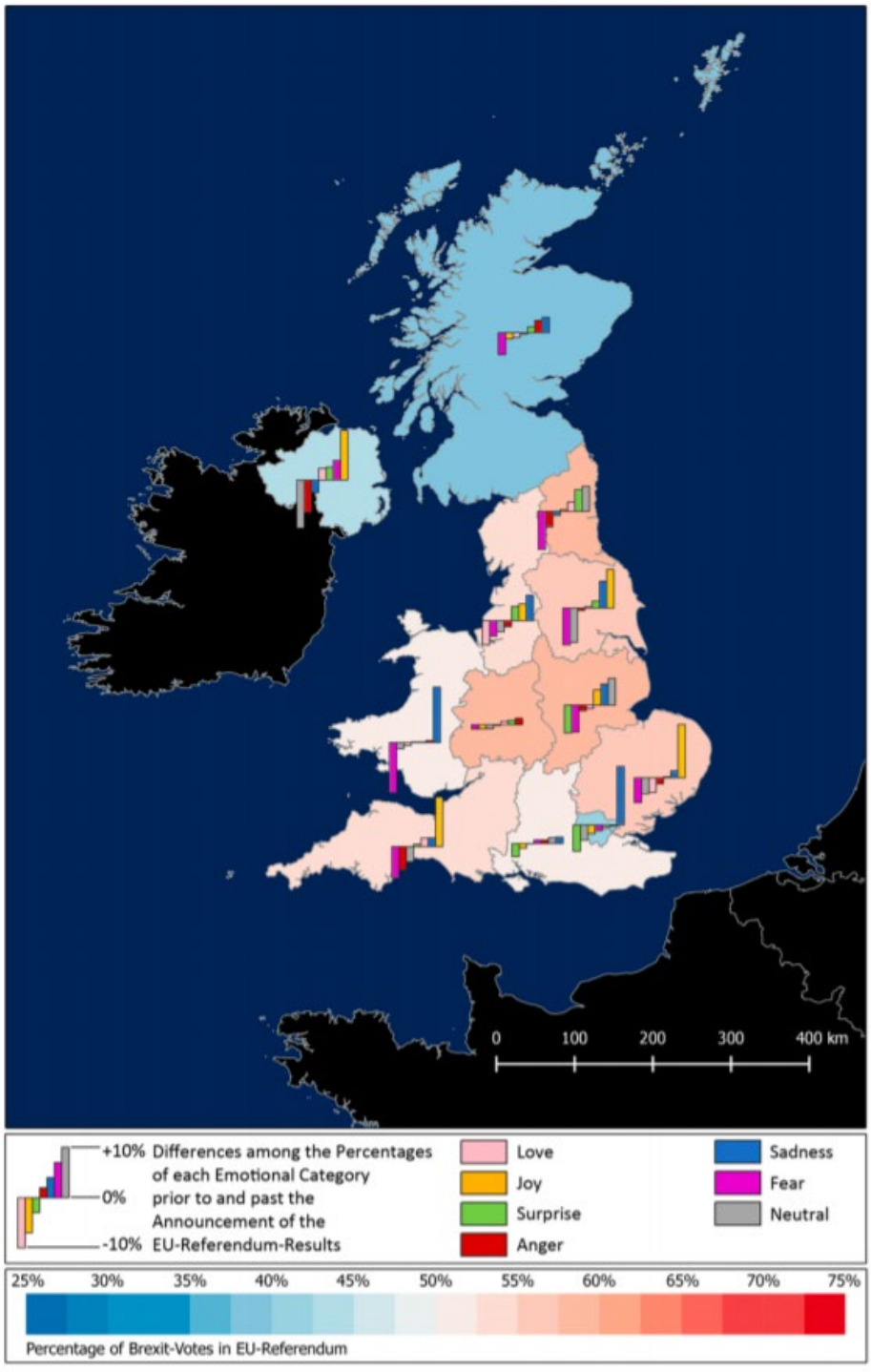



***Figure 2.3:*** *An emotion map taken from Hauthal et al (2019, p16) based on emojis in geolocated tweets about the Brexit referendum.*

Hauthal et al (2019) have since developed this process further by extracting emotional context from emojis found in geolocated tweets. By using the case study of Brexit, a map producing the atmosphere change of different regions around the United Kingdom between before and after the announcement of the referendum results was created (Figure 2.3). Unlike the Dresden maps, this map places a bar chart

on top of each region. It is, however, hard to gain inferences about the atmosphere of each region. Like the Dresden maps, it requires supplementary information to provide the emotional context. They are not intrinsically describing the emotion of the places in Dresden or the United Kingdom. All these maps represent aggregated data. Despite acknowledging the variations in idiosyncratic experiences there are no attempts to visualize non-aggregated data (Hauthal & Burghardt, 2016a). Mapping idiosyncratic experiences and emotions requires a different approach to the approaches found here.

Attempts to describe emotions in maps using art have been conducted (Bogucka & Meng, 2019). The maps were generated via algorithm by merging artistic works, painted in a way that is indicative of the emotion of an idiosyncratic experience in a place, and a base map. The generated maps were regarded as visually attractive. Input artworks containing plenty of points, lines and polygons transferred best and showed a high level of cartographic detail. During the study, there were instances of phantom features being generated on the final output, but the maps succeed very well in communicating how the artists experienced the emotion of the place. This study opens the possibility to transfer artistic and less conventional ways to Cartography to improve the storytelling capabilities of maps (Bogucka & Meng, 2019).

## 2.4 Art and Illustrative Maps

Mind the Map – Illustrated Maps and Cartography (Antoniou et al, 2015) is a book that has curated highly commended examples of illustrative maps from around the world. The title itself signifies a distinction between illustrative maps and cartography by naming them these two terms separately. Antoniou et al (2015) state that you can be a mapmaker without identifying yourself as a cartographer. This applies to anybody who wants to communicate a spatial narrative visually, such as many geographers, illustrators, and reporters. Essentially anybody who wants to communicate a spatial narrative visually. Many of the curated illustrative maps disregard traditional cartographic rules such as scale and projection and they push the traditional standards in cartography to enhance elements such as emotion, atmosphere, and idiosyncratic experiences (Antoniou et al, 2015; Hancock et al, 2018).

Cartwright (2009) discussed how science and technology have often dominated cartography by requiring maps to be factually correct and functional. Many academics acknowledge a common bias towards technology and science over art and the contributions of art to cartography should be explored, understood, and appreciated more (Krygier, 1995; Cosgrove, 2005; Cartwright, 2009, 2010; Jennings, 2011). Maybe the science and technology bias to maps makes many illustrative 'mapmakers' identified by Antoniou et al (2015) reluctant to call themselves cartographers or integrate further with the more technological and scientific cartographic community. Another term tying cartography and art closer together is the 'cartist' (Bogucka, 2019). A cartist is described as an increasing domain filled by people who have an artistic flair and mindset coupled with technical nous for tasks such as data processing (Bogucka, 2019).

Hancock et al (2018) draw on the power of an illustrative map to be able to communicate idiosyncratic narratives and experiences by distancing itself from traditional cartography, which is often regarded as being precise and overly technical. The power of map illustration is described to be best in communicating places rather than merely displaying spaces (Hancock et al, 2018). This again is another detachment from cartography by pushing the illustrative mapmaking distinction. There is potential that cartography can learn techniques from the supposed art-bias of illustrative map making to better visualise human geographic phenomena. As mentioned in Section 2.3.4, illustrative maps may hold the

answer to better visualise the park place ballets described by Eck & Pijpers (2017, p.170) as well as the market stall atmosphere described by Seamon & Nordin (1980, p.37).

Kraak & Fabrikant (2017) propose that the popularity of maps, in general, is often due to their artistic element. The artistic community has explored the world of maps, and artists in increasing quantity are using maps as "a congenial object, a fruitful subject and/or a productive method" (Wood et al, 2010, p.37). It is common to see maps being commonly used as designs on high street products as well as maps being hung in homes and galleries as art. Maps are trendy, maps are in vogue. It is felt that artistic approaches still can offer more to the field of cartography then just producing pieces that are easy on the eye (Cartwright, 2010).

There is an increasing focus on art and design by academic cartographers (Cartwright, 2009; Kent, 2017; Bogucka & Meng, 2019). Kent (2017) hypothesises that this shift is caused by technological improvements allowing greater access and increased sophistication of digital hardware, secondary data and graphics software has led to "the rise of the individual mapmaker" (Kent, 2017, p3). The individual mapmaker may have limited (or no) cartographic training and therefore "the attention of the cartographic community has arguably shifted further and further towards presentation and aesthetics, placing more focus on aspects of beauty and effect" (Kent, 2017, p3).

Desclaux-Salachas (2017) has curated a collection of maps believed to be "modern maps" (Desclaux-Salachas, 2017, p4). The curated maps have very varied mediums of communication and they generally contain high levels of scientific and technological detail. However, all these maps also have a high artistic element to them. The design of the maps makes them aesthetically very appealing and aligns with Cartwright's (2009) view that maps art and design are becoming increasingly important and influential in modern cartography (or traditionally undervalued). As a result, Desclaux-Salachas' (2017) book aims to bring together the separation between illustrative mapmaking and cartography under the term cartographics. Desclaux-Salachas thus titled her work: The Art of Cartographics: Designing the Modern Map. Using the term 'cartographics' as opposed to cartography highlights the importance and graphical nature of present-day cartography, not just science and technology (Cartwright, 2009). The title could be perceived as cartographics in the sense of 'the modern map'. Any lack of art and design considerations are not perceived to be a part of modern cartography and are old and outdated.

By understanding the value of techniques in art and illustration to visually communicate narrative and emotions, many human geographic phenomena such as the sense of place and place ballets could (and should) be better visualized.

# 3. METHODS

This chapter provides an insight into the plan to achieve the research objectives and questions. It introduces the two study sites and explains why they were chosen before outlining the process of creating accurate park personas which the visualisations will be based off. The chapter then discusses how the visualisations have been developed and how they will be evaluated and statistically analysed.

## 3.1. Study sites

Two urban parks in the United Kingdom were chosen as study sites due to a parks nature of being an accessible location for the surrounding population. Parks were also chosen as affordances can vary greatly due to factors such as levels council funding, local population demographics and the surrounding physical geography. Parks are also "places where encounters between 'familiar strangers' are not uncommon" (Eck & Pijpers, 2017, p168) so there is also an increased chance of identifying place ballets. During this study, the United Kingdom experienced a lockdown due to the coronavirus pandemic with parks being one of the public spaces that remained open (UK Government, 2020).

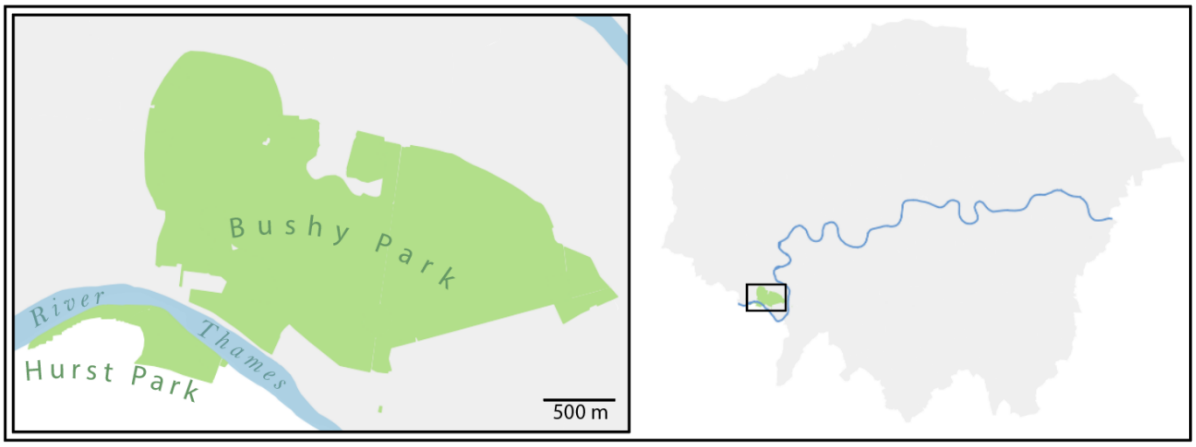



**Figure 3.1** *The location of the two study sites with Greater London (grey) for reference.*


***Figure 3.2*** *An overview map of Bushy Park*

The two selected urban parks are found in the suburbs of South West London (Figure 3.1). At 1,1000 acres, Bushy Park (Figure 3.2) is the second largest of the of London's eight Royal Parks (The Royal Parks, n.d.a) and is owned by the Crown (The Royal Parks, n.d.b). The park was established in 1529 and was used by King Henry VIII as a deer hunting ground (The Royal Parks, n.d.a). The iconic deer population still roam freely throughout the park. The park is maintained in a semi-natural state and is a designated Site of Special Scientific Interest for its diverse habitat types that can be found there (Natural England, 2014).

The park is popular with dog walkers and runners. The first 'Parkrun' took place in Bushy Park in 2004. Parkrun is a five-kilometre running race that occurs every Saturday morning at over 700 locations around the world. Bushy Parkrun consistently achieves over 1,000 runners each week (Parkrun, 2020).

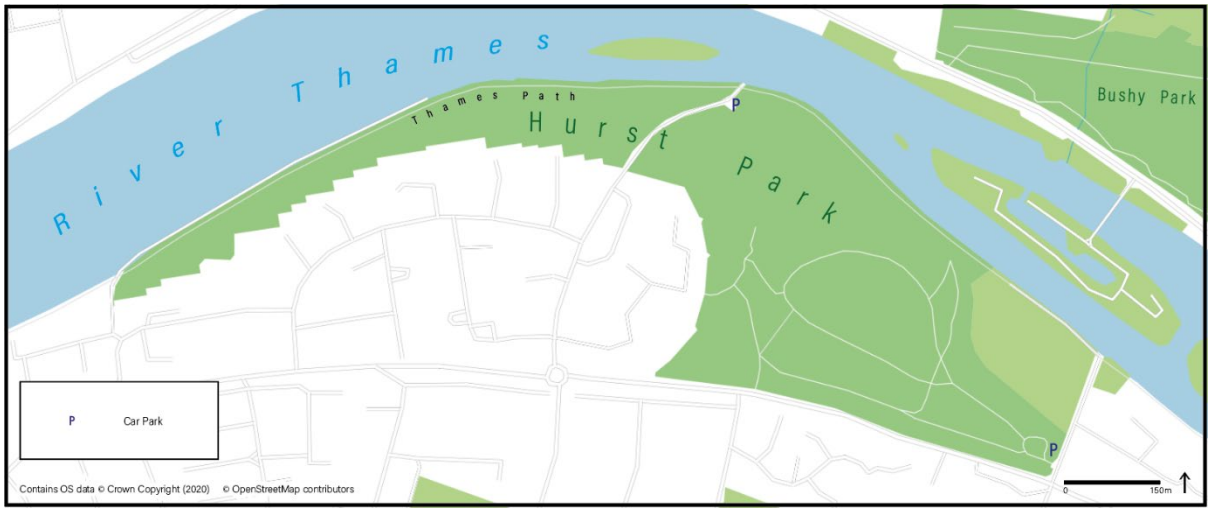



***Figure 3.3*** *An overview map of Hurst Park*

Hurst Park (Figure 3.3) is a floodplain on the southern bank of the River Thames in suburban London. The park is popular amongst dog walkers and joggers. The Thames Path, a 296km route from the source of the Thames to the Thames Barrier passes through the park (National Trails, n.d.). This route is popular for ramblers and cyclists who travel along the route through the park.

The park is split into two roughly even sections. The northern section is open, maintained lawn. The southern section is meadowland scattered with copses. The expected atmosphere of the park is to be largely homogeneous with faint minor zones reflecting the changing affordances across the meadows, lawn and river walk.

## 3.2. Persona Development

To be able to apply visualisation techniques of platial features on the park maps an understanding of the park experiences that occur at Bushy and Hurst Park needs to be achieved. This allows for meaningful visualisations to be created which acknowledge the experienced atmospheres, place ballets and affordances found in the parks.

Ten interviews were undertaken with regular park users. The interviewees were found through local neighbourhood Facebook groups. The interviews were initially planned so the park users were accompanied on their usual park journeys in the same interview style used by Eck and Pijpers (2017). Due to COVID-19, only one interviewee was comfortable meeting socially distanced in person. The remainder of the interviews were conducted via video chat (3), audio chat (5) and text-based (1). The interviews were roughly 30 minutes in length. To protect the identities of the interviewees all identifiable information, such as their names, have been changed. A breakdown of the interviews is shown in Table 3.1. Full transcripts of the interviews can be found in Appendix A.

***Table 3.1*** *A breakdown of the interviews*

| Name | M/F | Age range | Interview Style | Bushy Park | Hurst Park | Predominant Park Use | Visits per week | Place Ballet? |
|---|---|---|---|---|---|---|---|---|
| Adam | M | 20's | Socially distanced in person | ✓ | | Running | 1 | Yes |
| John | M | 30's | Video & Audio | | ✓ | Dog Walking | 3 | Yes |
| Sue | F | 40's | Audio | | ✓ | Dog Walking | 4 – 5 | Yes |
| Martin | M | 40's | Audio | ✓ | | Running | 5 | Yes |
| Louise | F | 30's | Video & Audio | ✓ | | Walker with Toddler | 3 | No |
| June | F | 50's | Audio | ✓ | | Cycling | 2 - 3 | No |
| Jackie | F | 30's | Audio | | ✓ | Running | 3 | Yes |
| Lisa | F | 50's | Video & Audio | | ✓ | Dog Walking | 7 | No |
| Mary | F | 30's | Video & Audio | ✓ | ✓ | Walking | 1 | Yes |
| Jim | M | 40's | Text-Based | ✓ | | Running | 6 | No |

Five interviews for each park was intended. During one interview it became apparent that the interviewee was a regular user of both parks. As a result, there the ten interviews cover Bushy Park six times and Hurst Park five times. The interviewee's ages ranged between being in their 20's and their 50's with four males and six females. All interviewees visited the parks at least once a week. One interviewee visited Hurst Park every day.

Of the six interviews for Bushy Park, half the interviewees mainly used it for running, two for walking (one with a toddler) and one for cycling. There were no dog walkers. Of the five interviews for Hurst Park, three used it predominately for dog walking, one for running and one for walking.

Although one interviewee did not believe it would be possible to experience a place ballet in the parks six of the ten interviewees were able to describe at least one each that they experience. Mary has made friends through a place ballet and now organise trips to the park together. Jackie experiences three on her runs. One of these is with an unhoused man who has become a local figure and plays chess with passers-by at 'his' bench. Mary referred to the man by a friendly nickname the local community have adopted for him. Since the interviews were conducted other members of a neighbourhood Facebook group in his area have commented concern for him when he wasn't at his usual bench. One Facebook user wrote "*I notice[d] on my walk today that ‹name omitted› has left (sic) this [his] bench. I assume he now has a place to stay (sic) safely, I do hope so*" (Blaseby, 2020). The unhoused man appears to experience place ballets with many members of the local community he has since received birthday cards and presents. Paintings of him on 'his' bench are sold by local artists to raise money for homeless charities (Elworthy, 2020).

It was particularly interesting that three of the Bushy Park users mentioned that at one particular point in Bushy Park they feel anxious and hyper-aware of their surroundings. Martin described it as a "*chokepoint*" where many busy paths converge to a narrow section between the edge of the park and the fenced-off Woodland Gardens. At this point cyclists, dogs, deer, cars can appear at varying speeds and levels of unpredictability. As a result, this section is less relaxing than many other parts of the park that they mention.

In Hurst Park, the notion that there was a conflict between dog walkers and other park users arose. John described how the bottom section of Hurst Park was ideal for dog walkers and now they almost have an air of ownership over the park section. "*Where I just go is the dog walking circuit as such. Like everyone walks their dog on that route... you'll sometimes hear people say 'why are you cycling here? It's dangerous for the dogs. Well, you are allowed to [cycle here] but you know it's sort of now owned by the dog walkers.*" The hostility has been reciprocated when dog walkers ventured out of their zone as Lisa remarks "*I've had in the last week people swearing at me because of my dog because she's run on their tablecloth that's on the ground... the language was pretty ripe actually*". The interviews have shown that Hurst Park is more zonal with its park users and atmosphere than Bushy Park. This has been reflected in the created personas

As a result of the interviews, realistic personas that reflect the way both parks are experienced could be created. These personas were then applied when developing visualisations. The use of personas further anonymised the identities of the interviewees by drawing on mutual feelings and experiences whilst still producing idiosyncratic map outputs.

## 3.3 Personas in the Context of the Study

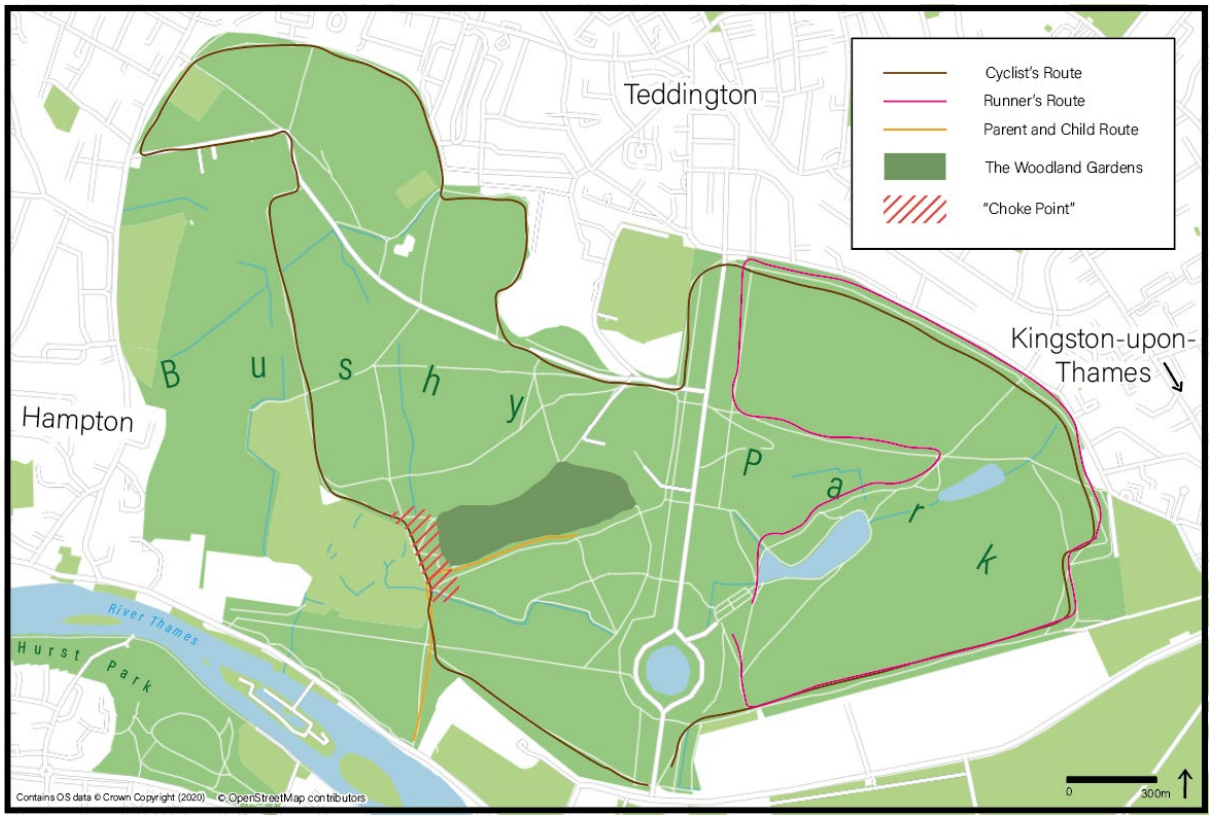



***Figure 3.4*** *The routes of three park personas in Bushy Park*

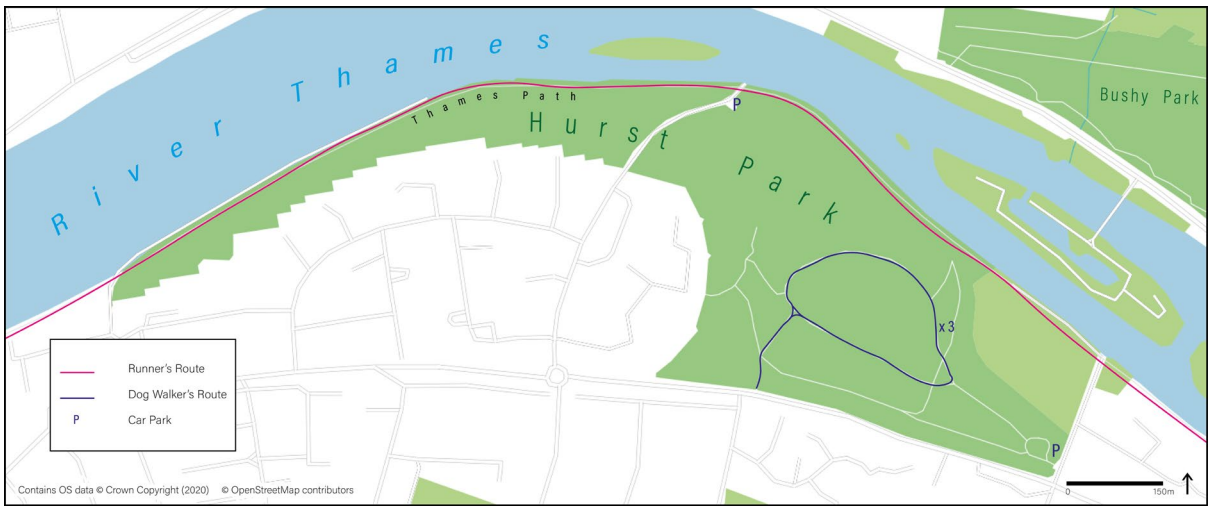



***Figure 3.5*** *The routes of two park personas in Hurst Park*

Maps of Bushy and Hurst Park have been generated and the routes of the created personas have been plotted (Figures 3.4 and 3.5). These maps are simply communicating the routes of the personas and not attempting to communicate any platial information.

The following subsections describe the created park personas. Quotes have been taken from the conducted interviews. Quoted names have been changed and all other identifying information has been anonymised.

### 3.3.1 The Runner

Male in his mid-30's follows a strict time pattern, jogging every weekday before work and a longer route on weekend mornings. He follows established routes that cover specific distances, most commonly 5km and 10km, one of these are shown in Figure 3.4. Aside from the car park, he does not use any of the park facilities. Different sections of Bushy Park trigger different memories of his childhood "*When you go round Kingston Gate it reminds me of some areas around Poole Harbour [located on the south coast of England], very happy childhood memories particularly*". Due to the frequency and rigidity of his visits, he experiences many place ballets.

In Bushy Park, the strongest place ballet the runner experiences are with a lady who is walking her black terrier and the frequency of their visits are becoming a jovial part of their mornings. "*I see her 3 times a week. Always around 09:30 am* [...] *It's almost becoming a bit of a, not a joke but it's like 'oh hi' 'hi'*". Their place ballet is strong enough to alert the runner to his companions' absence. "*I'd have a moment and think 'oh did she go on holiday' you'd kind of wonder why [she was not there]*"

In Hurst Park the runner incorporates the Thames Path route that goes through the park along the bank of the Thames, this is depicted in Figure 3.5 Along this route, they experience a place ballet with an elderly couple who are walking in the opposing direction.

### 3.3.2 The Walker

Female in her 70's who likes to ramble around both parks exploring new areas as she pleases. As she is retired, she is very flexible with her visiting times and follows no structured routine, although she prefers visiting during traditional working hours as it is quieter. Due to the lack of routine, she experiences no place ballets both parks. In Bushy Park, they like to visit The Woodland Gardens.

The walkers least favourite part of Bushy Park is what she describes as the 'chokepoint' (Figure 3.4). Due to the layout of the park's fenced off areas, most paths heading between Hampton and Hampton Court converge here leading to lots of people meeting in a narrow segment of the path. Many types of park users converge here which can be stressful and mentally exhausting for the walker. Speeding cyclists, dogs off leads, runners and the occasional deer can all be found crossing over each other here not allowing for a peaceful part of her stroll.

### 3.3.3 The Cyclist

The cyclist likes to follow the perimeter of Bushy Park. Just like the walker she has a similar dislike of the 'chokepoint' and shares the same reasons why. "*If you're looking towards the Diana Fountain there are lots of trees and it's a lovely walkway down there. It's quite sheltered and I prefer those areas to the ones where there is a lot of open space and high grass and deer*". The cyclist does not experience any place ballets in either park.

### 3.3.4 The Parent and Small Child

In her 30's and with a young child this park users experience is very dependent on her young company. They follow the same route on each park visit to facilities such as The Woodland Gardens where it is safer for a young child away from dogs, deer, and cyclists. "*The Woodland Gardens... has a completely different atmosphere to the rest of the park... no dogs, no bikes, kind of peaceful, people don't go there to exercise so much. There are plants and waterways and there's family's sort of having picnics and things. No dogs. So that is the [sic] sort of Woodland Gardens. I've been blown away by the beauty of them*".

On their walk to The Woodland Gardens, they enter via the Hampton Court Road Gate and walk northwards. Along this route, they experience two areas of great stress. The first is at a crossroads where they often have cyclists speeding down at a blind corner and the second is the 'chokepoint' as experienced by the walker and cyclist. "*Because I'm with a 2-year-old I don't like a crossroads. So basically, there's a place where cyclists go very fast across before you get to the woodlands in both these areas*". The parent's senses are heightened as they fear for their child's safety. This route and both points are marked in Figure 3.4.

When visiting Hurst Park added caution is experienced alongside the River Thames due to water hazards. The majority of the trips stay away from this area. "*The river is very dangerous because he [a small child] has no concept of the dangers*"

### 3.3.5 The Dog Walker

Just like the parent and the small child, the dog walker's park visits are influenced heavily on their company which comes in the form of a three-year-old energetic border collie. Most visits occur in Hurst Park where the walks follow the oval path in the centre of the southern section (Figure 3.5). "*I think the path from a dog walking point of view the path dictates the activity as everyone sticks to the path with the island of long grass in the middle so from a human point of view we are all sheep and just stick to that path.*"

The dog walker acknowledges that there is an air of ownership in the southern section of Hurst Park. "*The dog walking bit as I'm now describing it has a very specific atmosphere. Sometimes detrimentally, like I think there's probably a feeling is that it is slightly owned by the dog walkers because you'll sometimes hear people say why are you cycling here? It's dangerous for the dogs. Well, you are allowed to [cycle here] but you know it's sort of now owned by the dog walkers whereas the rest of the park is more... yeah, it's just less enclosed*". The route rarely extends beyond the self-designated dog walking region to avoid any potential embarrassing behaviour from their dog around young children and picnics. "*In the last week people [have been] swearing at me because of my dog because she's run on their tablecloth that's on the ground*" Although an extreme case, it again highlights the potential for friction between different park-users when one veers into a different sub-region.

He believes that dog walking as a mutual park use has enabled a friendlier atmosphere in this park zone and has created its own sub-community. "*People are probably keeping themselves to themselves whereas the dog walk that you do is probably a little more social.*" The dog walker experience's many place ballets with other fellow dog walkers and has become friends with some. "*You see these people and it's got to the point now where people are on relatively regular schedules. As you walk around, you'll go 'oh hello Tom' and then you'll then converge your walk. So, we actually know quite a lot of people over there now*". He also believes that the dogs have added another layer to strengthen the place ballets and community feel as they act as an easy icebreaker in the park "*...And the dogs know each other. It's probably because the dogs are not as awkward as humans so they just play with each other and fight, so you get to know the owner of the dog. Initially, it is so and so's owner. So, you don't know their name [but you do know the dog's name] but then you might have a walk with them or a chat about the dogs*".

## 3.4 Visualisation Technique Development

Multiple visualisation techniques were developed to test research questions 2A-D. The developed techniques were implemented using a combination of QGIS and Adobe Illustrator. The following subsections explain the process of creating each technique.

### 3.4.1 Line Styling

Research question 2a *'How can a line be styled along a walking route to convey the changing sense of place?*' was approached by experimenting with line styling of the runner and dog walker's routes in Hurst Park. Four line styling approaches were made.

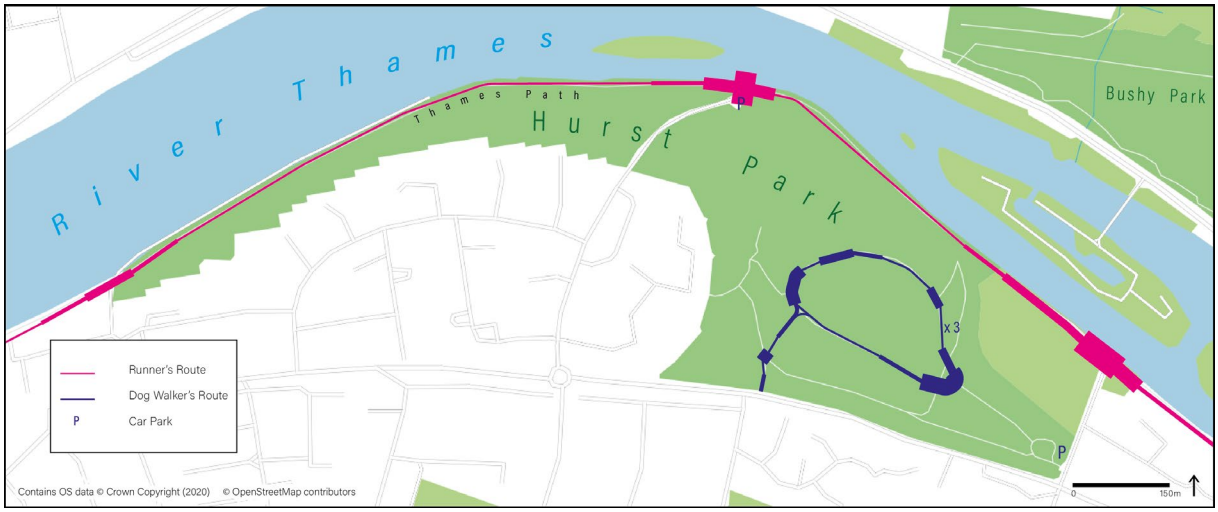



**Figure 3.6** *Thickness line styling example at Hurst Park showing the routes of the Runner (pink) along the Thames Path and the Dog Walker (blue).*

Variations in the weight of the line was the first styling attempt, this is shown in Figure 3.6. The greater the weight of the line is, represents a greater level of experienced stress. In the instance of the runner, the greatest level of stress was experienced when running through the car park found in the north of the park. High levels of stress are also experienced when entering and exiting the park via the Thames Path. This is represented by the increased line weight. This line styling approach was inspired through the notion of the more stressed you are the more alert and mentally congested with heightened senses and more alert to your surroundings. The more information the person is processing was then attempted to be visualised by more weight in the line.

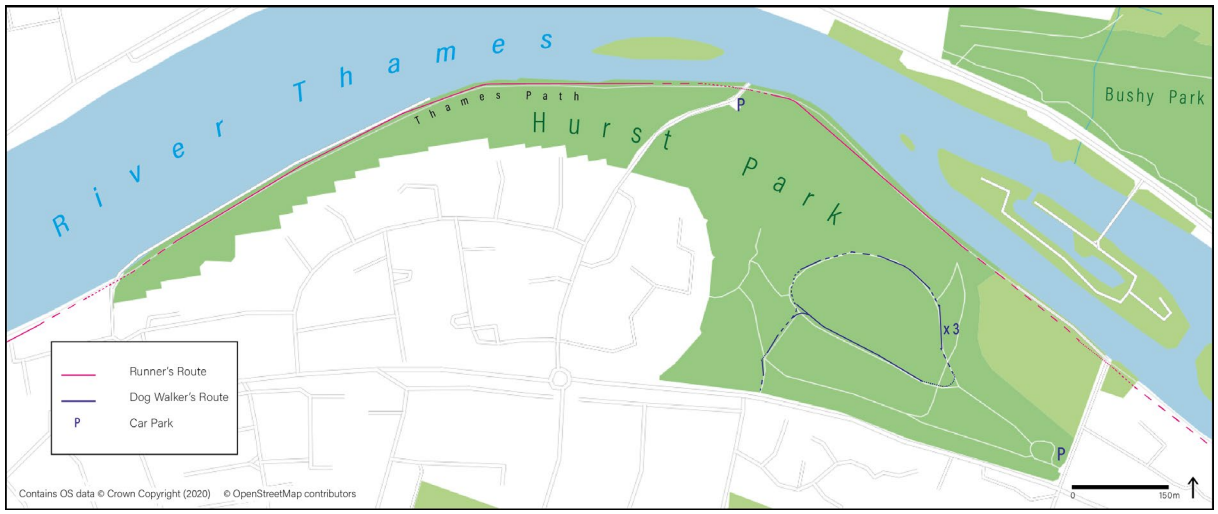



**Figure 3.7** *Dashed line styling example at Hurst Park showing the routes of the Runner (pink) along the Thames Path and the Dog Walker (blue).*

The second attempt at line styling is using dashed lines (Figure 3.7). The greater amount of dashes represents the more stress experienced by the traveller along the line. This line comes from the notion that with more stress the individual is 'broken up' with their focus. The breaks in the line represent this. The higher the frequency of line breaks represents a more significant disruption from focus, resulting in stress.

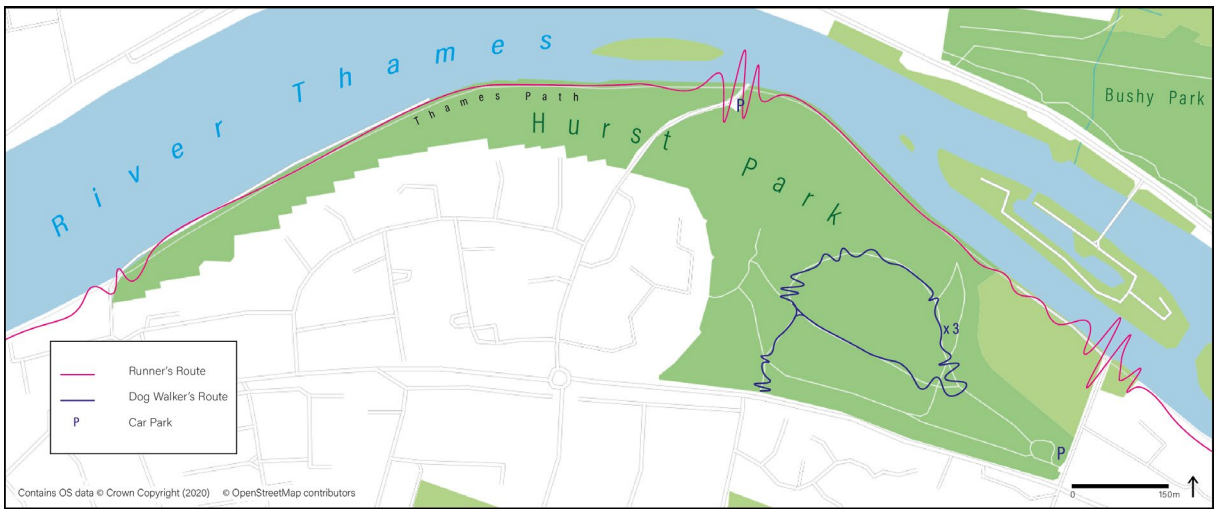



**Figure 3.8** *Jagged line styling example at Hurst Park showing the routes of the Runner (pink) along the Thames Path and the Dog Walker (blue).*

Adding jags or deviations to the line travelled is the third styling technique (Figure 3.8). The greater the deviation is from the path the more stress is experienced by the traveller. The thought behind this style is the greater the deviation from the path is similar to the deviation of the mind and greater stress is felt when the mind is 'all over the place'. The line styling may also seem erratic, like how a stressed person may feel.

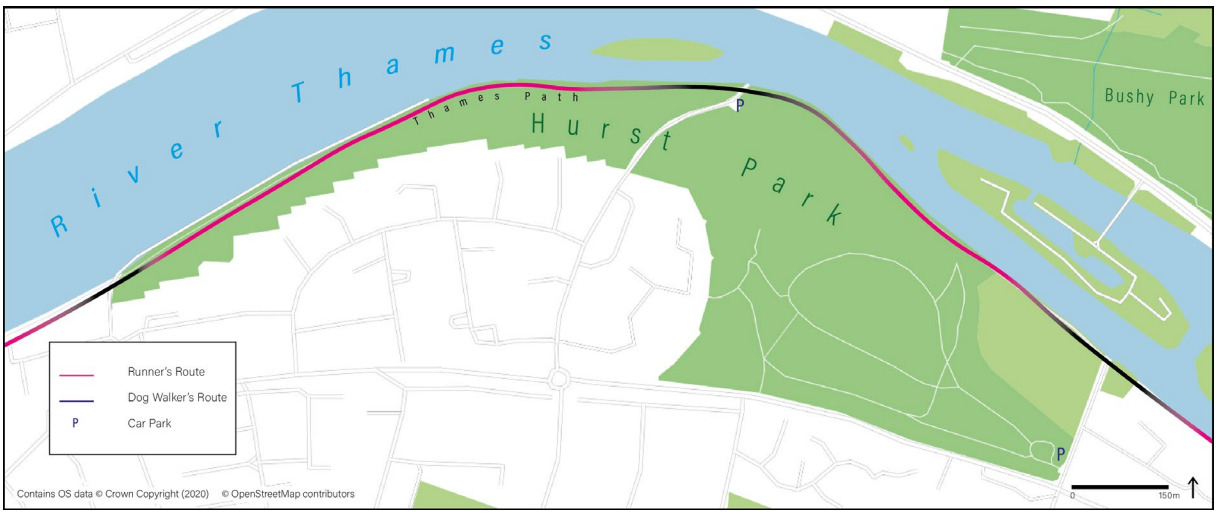



**Figure 3.9** *Intensity line styling example at Hurst Park showing the routes of the Runner (pink) along the Thames Path and the Dog Walker (blue).*

The final proposed line styling method is intensity (Figure 3.9). Where the line turns black instead of its initial colour, the more stressed the traveller feels. The use of colour in this way was inspired by the cartographer and illustrator who works under the pseudonym Running For Crayons (n.d.). Their belief is the strong use and manipulation of colour can communicate motion and emotion (Antoniou et al, 2015).

### 3.4.2 Place Ballets

To answer RQ2B, experiments for multiple place ballets identified by the personas were undertaken. The final visualizations, created in QGIS and Adobe Illustrator, focus on the place ballet that the runner experiences with a lady walking her black terrier dog in Bushy Park. This place ballet was chosen as the focus due to its strength. In the interviews (reported in Section 3.3.1) it was discussed with the most explicit location and times. It was also the most expected with the runner expressing the greatest level of concern if the dog walker was not present.

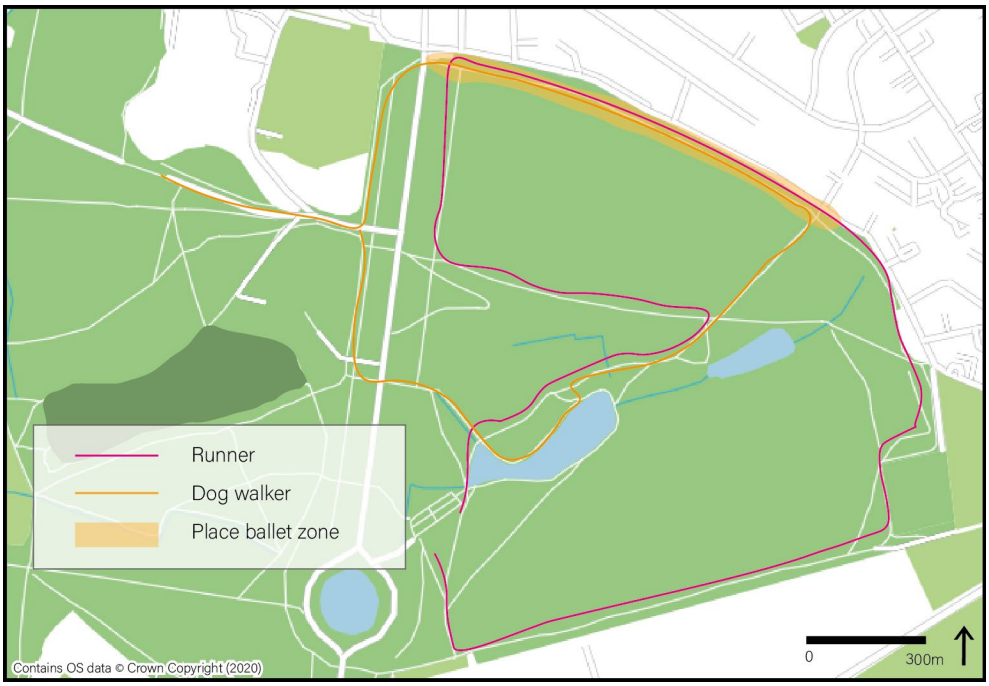



***Figure 3.10*** *The location of the place ballet between the runner and the dog walker*

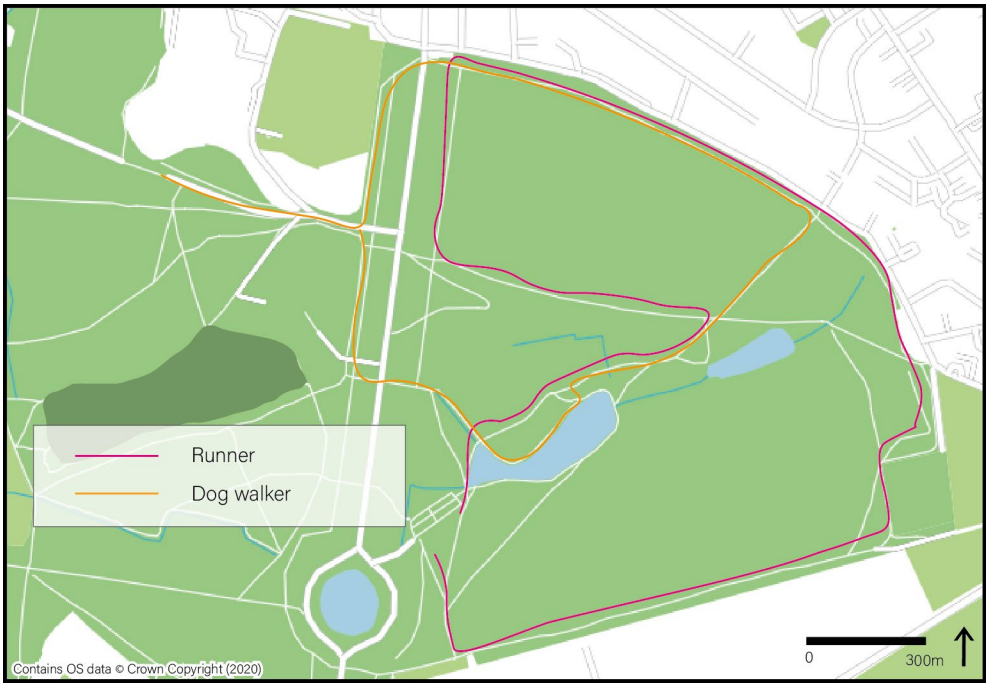



***Figure 3.11*** *Plain routes example in Bushy Park*

Figure 3.10 shows the area where the place ballet between the runner and the dog walker takes place. It is here where the place ballet is intended to be visualised. Figure 3.11 shows a control map created displaying the routes of the runner and dog walker with no attempt at displaying platial information. This map will be used to see how much, or little, information can be inferred by the map reader about the interactions between the two parties.

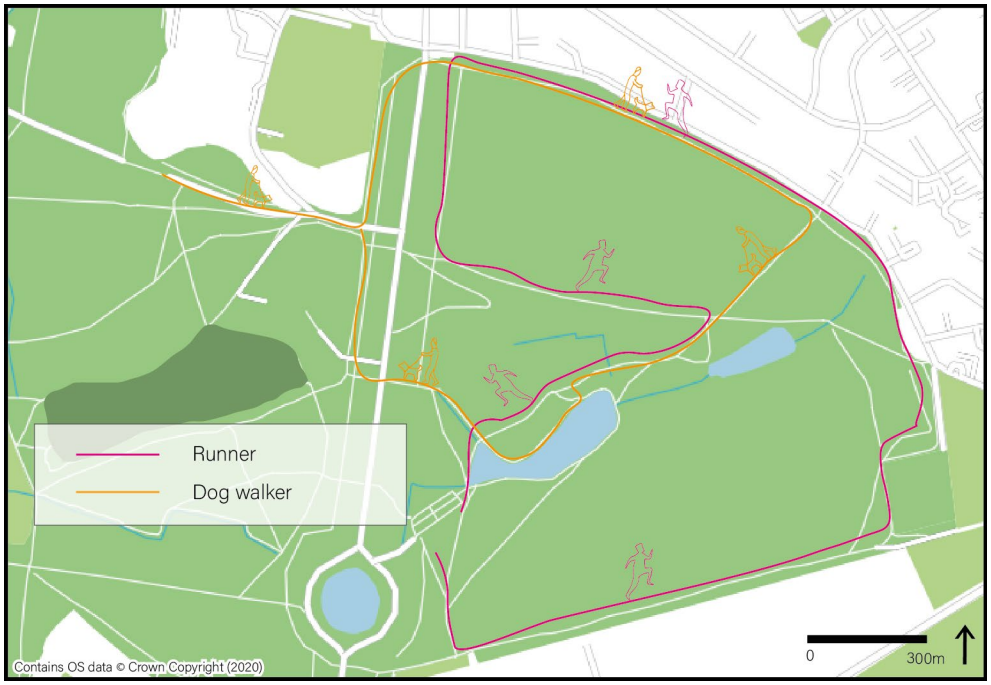



***Figure 3.12*** *Plain routes with characters in Bushy Park*

Figure 3.12 shows a variation with the implementation of characters. Many map illustrators have used characters as a tool to provide a narrative (Antoniou et al, 2015; Desclaux-Salachas, 2017). Map illustrators who have used this approach include Hotchin (n.d.), Hunt (n.d.) and Seki (n.d.). The implementation of characters can add information and narratives such as providing directional information as well as locational affordances (Desclaux-Salachas, 2017).

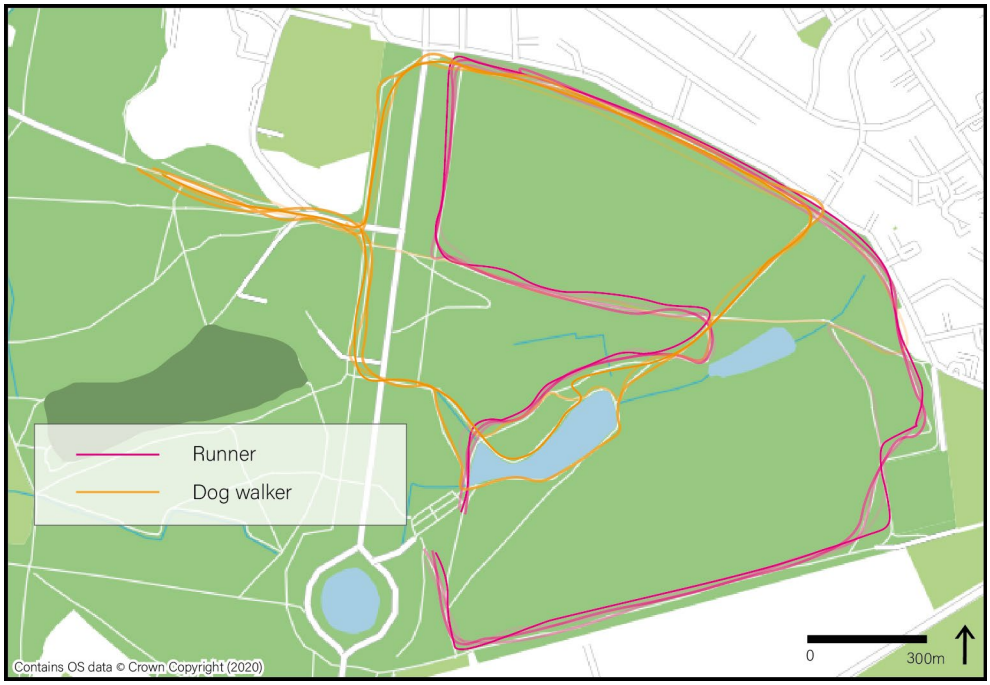



***Figure 3.13*** *Repeated, faded routes in Bushy Park*

Another variation displaying the place ballet is by placing the 'faded lines' of previous routes. Three additional lines of the previous three routes taken by each persona have been added. The further back in time the route was taken is reflected by lower transparency. It is hoped that the repeated nature of the routes indicated any place ballets that happen are a common and expected occurrence.

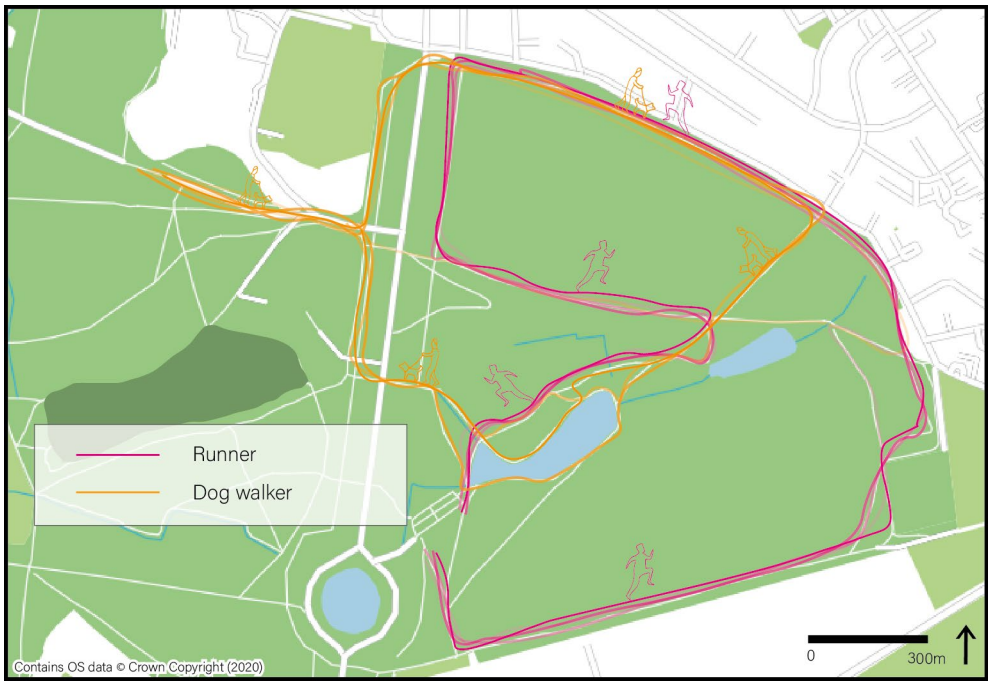



***Figure 3.14*** *Characters with repeated, faded routes in Bushy Park*

The final visualisation attempt is the combination of the previous two visualizations. Shown in Figure 3.14 it combines the affordances and the directional information of Figure 3.12 as well as the temporal element of the faded routes in Figure 3.13. It is hoped that these two techniques can complement each other and provide a rich context to the place ballet between the runner and the dog walker. However, there is a risk that too many illustration approaches may unnecessarily confuse the map reader and weaken the effectiveness of the visualization.

### 3.4.3 Map Styling

To answer RQ2C: "To what extent can the map style communicate the atmospheres of sub-regions?" The monochrome map style used by Eck and Pijpers (2017) was adapted to represent the park experience of the parent and child in Hurst Park. Like Eck and Pijpers (2017) radiating lines from features was employed. In this instance, they represent the park features and areas which cause stress to the parent of the small child. Eck and Pijpers (2017) used two-line frequencies (Figure 2.1) radiating from the market stalls in their map. The paper does not mention if a higher frequency of lines represents a more intense atmosphere. To represent different magnitudes of stress the different line stylings can be used, this research is aims to find the most effective line styling type.

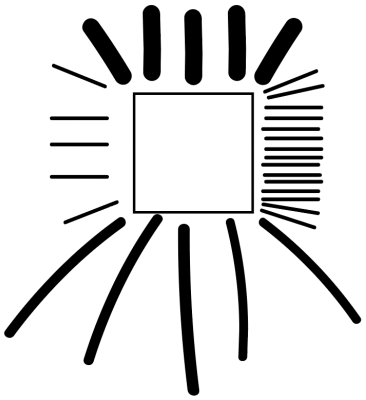


***Figure 3.15*** *The four radiating line types*

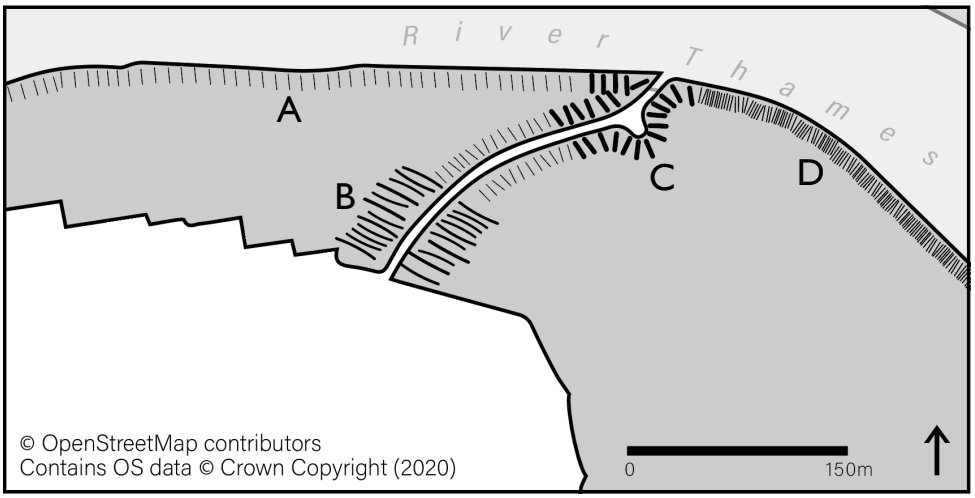
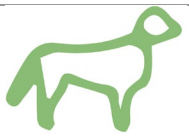



***Figure 3.16*** *The four radiating line styles applied to a section of Hurst Park*

Figure 3.15 shows four different ways the radiating lines can be styled to be able to determine which style is the most pervasive in communicating stress. Shown on a map (Figure 3.16), style A is used as a control, closely mimicking the style used by Eck and Pijpers (2017) for most market stalls. Relative to style A: style B has an approximate 3x increased length; style C has an approximate 3x increased weight and style D has an approximate 3x increased frequency.

### 3.4.4 Park Affordances

*Table 3.2 The symbols used to depict park affordances*

| Affordance | Icon | Hurst Park | Bushy Park |
|---|---|---|---|
| **Running** |  | ✓ | ✓ |
| **Dog walking** |  | ✓ | ✓ |
| **Football/soccer** |  | ✓ | ✓ |
| **Trees** |  | ✓ | ✓ |
| **Benches** |  | ✓ | ✓ |
| **Deer** |  | | ✓ |
| **Basketball** |  | ✓ | |
| **Swimming** |  | ✓ | |
| **Swans** |  | ✓ | |

To attempt to display subregions in the parks a subtle layer of map icons has been placed over the base map. The layer contains a series of icons which represent the dominant affordance that was found at

that park area during the interviews. A catalogue of the used symbols can be found in Table 3.2. Of Bertin's (1967) visual variables the icons vary in shape, hue and position. The icons have a different shape to communicate their affordance and position to show the location of this affordance. All land-based icons have the same hue and value, which is slightly darker than the green used in the base map. This is so it gives a subtle impression on the park subregions and does not distract from the non-platial map features. Repeated neighbouring symbols intend to indicate a larger zone and the creation of a subregion. Bushy Park has a total of six visualised affordances and Hurst Park has eight. Some affordances are limited to just one park, such as deer which are only found in Bushy Park.

The symbols were created as initially hand-drawn and then digitised in Adobe Illustrator. The hand-drawn style has been intentionally preserved due to inspiration from Hotchin's (n.d.) work where Hotchin (n.d.) believes the hand-drawn style better communicates the subjectivity and idiosyncrasies of experiencing a place (Antoniou et al, 2015).


**Figure 3.17** *Bushy Park with affordance symbols*

Bushy Park (Figure 3.17) was identified in the interviews to have less defined subregions. This is represented by the icons for each affordance to be spread across the park instead of clustered in one area. For example, deer icons can be found in all areas of the park. Football has a minor subregion of flat, maintained playing surfaces which are mostly found in the north-west of the park with a few areas also in the south. A similar distribution applies for the benches. Where the park becomes less intensely maintained and becomes wilder the symbols are typically not clustered.

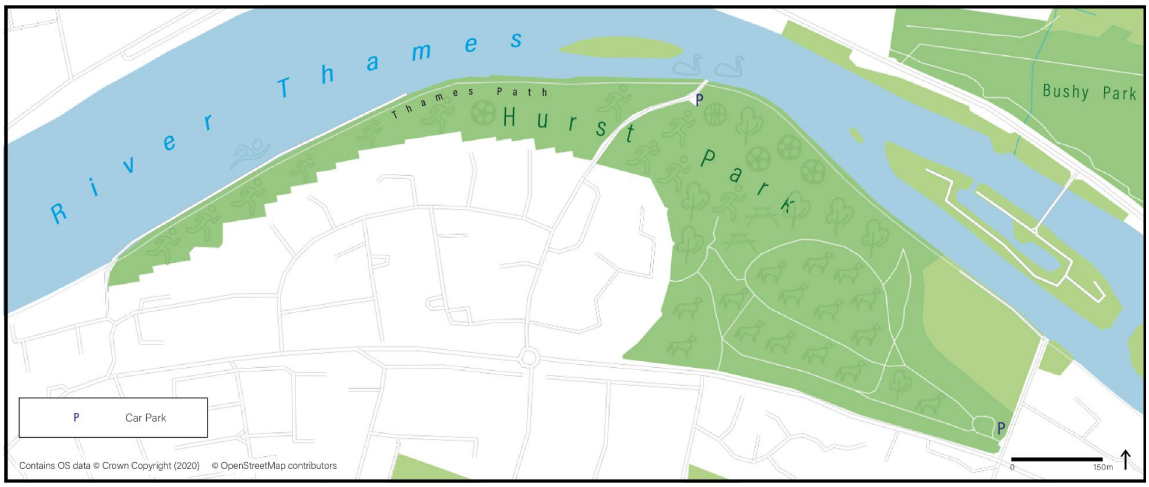



***Figure 3.18*** *Hurst Park with affordance symbols*

Hurst Park (Figure 3.18) however has more defined subregions. Most notably is the dog walking area in the south/south-east of the park. As this area is dominated by dog walkers it is represented by a large, homogenous cluster of dog symbols. The northern section of the park, despite being a similar size to the dog walking zone, is the least homogenous subregion and is made up of six different symbols.

## 3.5 Evaluation of the Visualisations

To quantifiably evaluate the effectiveness of the developed visualizations and answer RQ3, an online survey was conducted. The survey was produced via the website www.sosci.de. Before the survey was published publicly, a pretest was conducted. Following the pretest feedback, some questions were reworded to improve their readability and decrease potential confusion amongst the participants. A question asking participants to plot on a map the perceived locations of the place ballets was reformatted to allow for multiple point selections with clearer symbols. This and further changes based on the pretest feedback are discussed in the following subsections. The questionnaire was distributed via social media. Screenshots showing the entire questionnaire can be found in Appendix B.

The questionnaire opens with a consent page which introduces the potential participant to the research intentions as well as reminding them of their rights and how their data will be handled. To proceed to the remainder of the questionnaire the potential participant must confirm they are over 18 and have read and agreed to the conditions of the study.

The questionnaire then follows with a base map of both parks. The parks contain the path lines of the relevant personas with no attempted platial styling. The participants are asked to briefly familiarise themselves with the maps. A brief familiarisation will allow the participant to become comfortable with both park areas as well as notice the different visualisation techniques they will see in the following questions. Once the participant has done this they are prompted to press 'next' and respond to the study questions. The following subsections investigate how the four research directions we accounted for in the questionnaire.

### 3.5.1 Line Styling

The four generated line styling options were presented to the participant. For each option, the participant was given the same three statements about the different styling techniques and what they represent. The statements claimed the visualisations represented the persona's speed, acceleration, or stress levels. The participant was asked to read all the statements first before making selections, this was so any previous selection would not influence subsequent ones. For the jagged line visualisation (Figure 3.8) one additional statement was added: *The runner runs into the River Thames as they travel through Hurst Park.* Figure 3.8 shows that the runner's line travels in and out of the River Thames. If the line is truly representative of the location of the route, then the runner must have entered the river. However, if the respondent disagrees with the statement it means that they believe the direction of the line is being influenced by another factor and is not entirely representative of physical location.

They were then asked to select how much they agree or disagree with the statement by marking on a five-point Likert scale. The Likert scale was selected for this question as generates quantifiable, ordinal data output from opinion-based responses (Vogt, 1999; Denscombe, 2007). The quantifiable results then allow for much greater statistical analysis (Denscombe, 2007).

A five-point Likert scale from was selected as opposed to a four-point scale so there was a central, neutral option if the participant was ambivalent to the visualization. In the case of a four-point scale, they may have been forced to compromise and opt for a more weighted selection that is less representative of their opinion. The Likert scale used throughout the survey was highlighted by Vagias (2006), this was *strongly disagree/disagree/neither agree nor disagree/agree/strongly agree*. *Don't know* was also added to account for instances where the visualisations didn't make any sense to the participant. If the respondent responded *strongly disagree*, *disagree*, or *don't know* they were provided with a text box to input their interpretation.

***Table 3.3*** *The values attributed to each Likert response in the statistical calculations*

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

The results will be visualised by stacked, diverging bar charts and analysed with descriptive statistics. The Likert scale responses have been attributed to a numerical value to allow for statistical calculations, this can be seen in Table 3.3. These values will be true for all Likert analysis in this study. The mean and standard deviation for each question output will be calculated. Both the visual and statistical output will provide an initial impression of how each line style was received by the survey respondents. It will then be possible to make quick comparisons between responses and identify any trends in the results.

As the data is non-parametric and ordinal, the Friedman test will be employed to determine if there is a statistically significant influence on how the different line styles were interpreted by the survey respondents (Gilchrist & Samuels, 2014). The Friedman test will be applied in two ways. Firstly, it will be used to determine if there is a statistically significant difference in what the respondents perceived the line style to represent with the provided potential causes (speed, acceleration, and stress). Secondly, it will be applied to determine if there was a statistically significant difference in how the respondents interpreted the notion that the line styles were representing the persona's stress levels. If deemed

statistically significant, further exploration into which line styling technique was strongest at depicting the stress along a persona's route can be made. In both instances, an alpha value of 0.05 is used as it is a widely accepted, conventional significance value (Gilchrist & Samuels, 2014). For the Friedman tests, the null hypothesis ($H_0$) is that there is no significant difference between the compared results and the alternate hypothesis ($H_1$) is that there is a difference between the defined conditions. If there is a difference found, then an influence caused by the different line stylings can be inferred.

If the alternate hypothesis for any of the Friedman tests are accepted, then post hoc analysis will take place. To identify exactly where the significant differences are occurring between the styling methods a Dunn test will be employed (Dunn, 1964). The Dunn test is suitable for the post hoc analysis due to its handling of nominal and ordinal data (Stikpet, 2017). Every pair combination of line style will be compared through this test to identify where the significant difference lies. Like the Friedman test, the null hypothesis will be that there is no significant difference between the two compared conditions. The alternate hypothesis is that there is a significant difference between the two conditions.

### 3.5.2 Place Ballets

One by one, all four of the place ballet visualisation images (Figures 3.11 – 3.14) were shown to the participants. For each visualisation, the same nine statements were made. Using the same five-point Likert scale approach as discussed in Section 3.5.1, the participants were asked to respond to what extent they agree with each statement. The statements cover a base of temporal, geographical and interactional aspects of place ballets. The statements can be found in Table 3.4.

***Table 3.4*** *The statements used in the questionnaire concerning place ballets*

| **This map makes me think that the dog walker and the runner...** | **Place ballet aspect** |
|---|---|
| ...are visiting the park at the same time | Temporal |
| ...only took these routes once | Temporal |
| ...interact with each other at only one location along the route | Geographical |
| ...interact with each other at multiple locations on the route | Geographical |
| ...do not interact with each other on their visits | Interactional |
| ...interacted with each other by coincidence | Interactional |
| ...interact with each other on different days in the park | Interactional |
| ...do not know each other | Interactional |
| ...expect to see each other when they visit the park | Interactional |

Using the attributed values for the Likert responses, as shown in Table 3.3, the mean and standard deviation of the statements in Table 3.4 can be calculated. As this Likert response data for each of the statements is also non-parametric, ordinal and contains more than two visualizations the Friedman test will also be employed. The Friedman test will determine if there is a statistically significant difference between the respondent's interpretations between the four visualisations. For each of the statements, the null hypothesis ($H_0$) is that there is no statistically significant difference in the respondents' opinions regarding the statements when viewing the different visualisations. The alternate hypothesis ($H_1$) is that there is a statistically significant difference between how the different visualisations are

interpreted. If the Chi-Squared output of the Friedman test is greater than the calculated significance value, then the null hypothesis is rejected, and the alternate hypothesis is accepted.

Like the line styling analysis, if the alternate hypothesis for any of the Friedman tests are accepted, then post hoc analysis will take place. To identify exactly where the significant differences are occurring between the styling methods a Dunn test will be employed (Dunn, 1964). Every pair of place ballet visualisation style combination will be compared through this test to identify where the significant difference lies. Like the Friedman test, the null hypothesis will be that there is no significant difference between the two compared conditions. The alternate condition is that there is a significant difference between the two conditions.

For each visualisation, the participant was also invited to mark on the map up to four locations where they believed a place ballet may occur. For this, the output data result is a set of coordinates which could be replotted with all guesses to get an impression where the respondents believe the place ballet(s) is/are taking place. K-Means clustering will then be conducted to determine the locations and sizes of any clusters that may be found. The clustering will be undertaken in the R language with the output clusters being placed on top of the visualisations used in the survey. This will allow for a straightforward comparison and rich discussion as to why clusters may be found where they are and why they may not be consistent across all the visualisations.

### 3.5.3 Map Styling

To generate a hierarchy of the most pervasive radiating line style the participants were presented with Figure 3.16 and asked which of the lettered dash types they perceived to be indicative of the greatest stress. This question was then be repeated for the second-most, third-most and fourth-most (least) stressful area. The map contains little context as to what the specific features are that are generating the different stress levels, removing any subconscious bias. The collected survey data will be discussed with descriptive statistics and presented in a horizontal, 100% stacked bar chart. This will allow for quick and easy comparison to determine the hierarchy of effectiveness between the four radiation line styles.

### 3.5.4 Park Affordances

The maps of Bushy and Hurst Park with the affordance layer were shown to the participants concurrently. Eight statements were written comparing the two maps. The statements refer to the experiences of subregions and affordances experienced by the personas. Using the same five-point Likert scale approach as discussed in Section 3.5.1, the participants are asked to respond to what extent they agree with each statement. A list of the statements can be found in Table 3.5.

***Table 3.5*** *The statements used in the questionnaire concerning the park affordances*

| | |
|---|---|
| 1 | There is a wider variety of activities in Bushy Park compared to Hurst Park |
| 2 | You can play football/soccer anywhere in Hurst Park |
| 3 | You can play football/soccer anywhere in Bushy Park |
| 4 | Deer roam freely in Bushy Park |
| 5 | Dogs are welcome in all sections of Bushy Park |
| 6 | Dogs are welcome in all sections of Hurst Park |
| 7 | Bushy Park is homogenous in its park use |
| 8 | Hurst Park is homogenous in its park use |

Just like in Sections 3.5.1 and 3.5.2, the Likert responses are assigned the numeric values shown in Table 3.3. This allows for a descriptive statistical analysis where the mean results of responses and the standard deviations can be compared and evaluated. Furthermore, Students T-Tests will be conducted on the comparative statements in Table 3.5 (2&3, 5&6, 7&8) to see if there is a statistically significant difference in how the two parks are perceived by the survey respondents. For each test, the null hypothesis states that there is no significant difference between the responses to the two statements and the alternate hypothesis is that there is a significant difference between the two responses.

# 4. RESULTS

After being published, the questionnaire ran for two weeks and was attempted 180 times. It was fully completed 75 (42%) times. The statistical analysis outlined in the methods has been applied to the 75 returned surveys. The following subchapters separate each section of the questionnaire, initially looking at the descriptive statistics before assessing the statistical significance of the results.

## 4.1 Line Styling

### 4.1.1 Descriptive Statistics

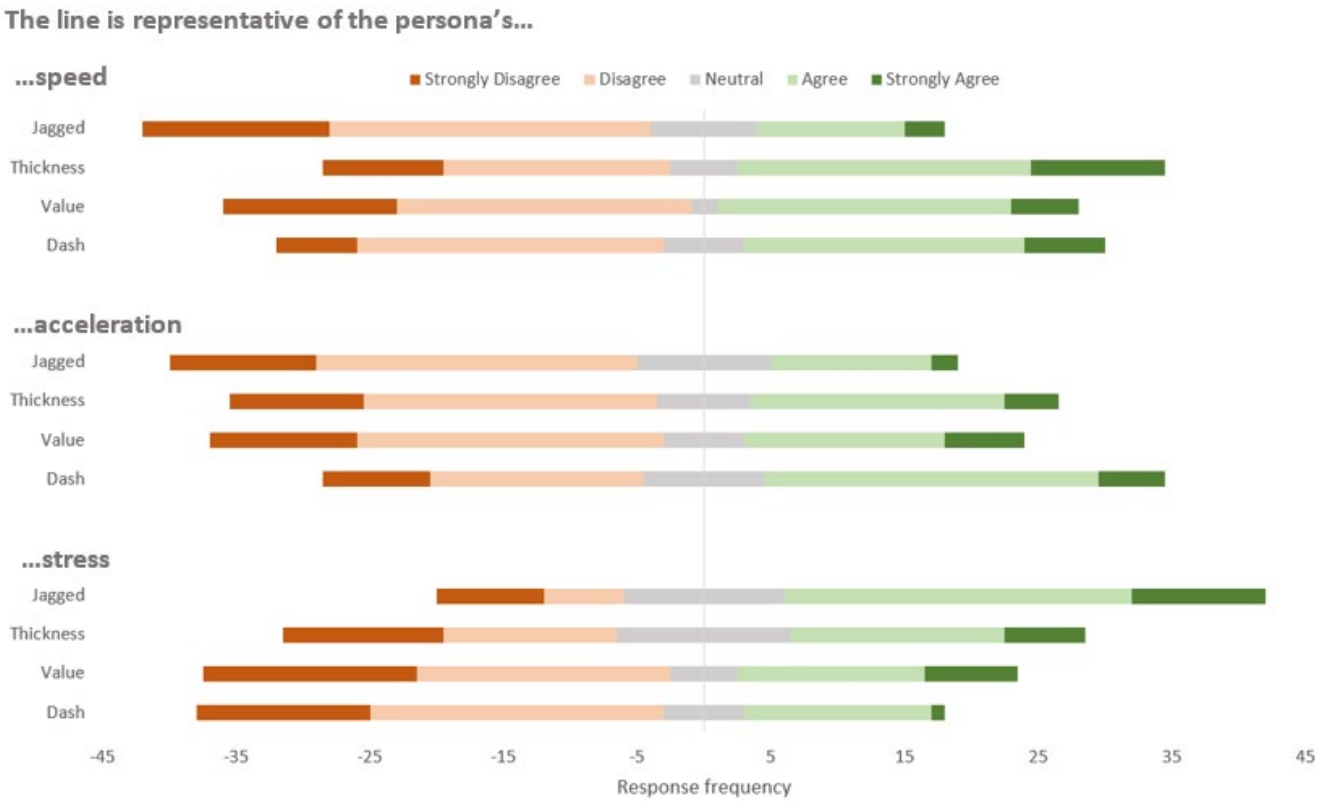



***Figure 4.1*** *Survey respondents' perceptions of what each line style represents for the personas.*

***Table 4.1*** *The mean and standard deviation of the survey responses concerning the perceived nature of each line styling. 1 = strongly disagree; 5 = strongly agree. The highest values for each potential nature are in bold.*

| The line is representative of the personas… | Line type | Mean | Standard Deviation |
|---|---|---|---|
| …speed | Jagged | 2.42 | 2.19 |
| | Thickness | **3.11** | **2.89** |
| | Value | 2.75 | 2.59 |
| | Dash | 2.97 | 2.71 |
| ...acceleration | Jagged | 2.49 | 2.22 |
| | Thickness | 2.76 | 2.52 |
| | Value | 2.70 | 2.50 |
| | Dash | **3.04** | **2.78** |
| …stress | Jagged | **3.39** | **3.10** |
| | Thickness | 2.85 | 2.63 |
| | Value | 2.62 | 2.48 |
| | Dash | 2.43 | 2.19 |

Figure 4.1 shows how the survey respondents reacted to the potential reasonings behind the four different line styling approaches. Table 4.1 presents the mean values for each potential reason behind every line style. The persona's travelling speed was most convincingly a justification for the thickness line styling method with the highest mean value of 3.11. The survey respondents favoured the jagged line to be the least indicative of the personas speed with the lowest mean value (2.42) and the highest proportion of respondents selecting "strongly disagree". All line stylings in the speed category had high standard deviations ranging from 2.19 (jagged) to 2.89 (thickness), reflecting the high variation in the responses to all the potential causes. There is no clear preference in line style that represents speed. Similarly, when looking at which style could explain the persona's acceleration jagged was again the least favourite with the lowest mean (2.49) and most selections for 'strongly disagree'. The dash line styling faired best with the highest mean (3.04). However, like before there was a wide variation in responses which is reflected with by the continuation of high standard deviation values reported in Table 4.1.

When comparing the responses for the personas stress levels, what all the line styles were trying to communicate, the jagged line style appears a clear favourite. With a mean value of 3.39, jagged representing stress was the strongest conviction across all the line styles and potential meanings. However, like before, the responses were still polarising, and this is again reflected in the high standard deviation values. The highest standard deviation found was for jagged representing stress at 3.10.

When a respondent did not agree with the potential causes for the line stylings, they were invited to suggest what other reason they felt was most intuitive. For the value line style, there was no dominate alternative suggestion with most respondents using the opportunity to report that there was insufficient information for them to have an impression. For the thickness line styling the most common

alternative was that the changing thickness of the path represented the changing width of the physical path. The main alternative suggestion for the dash line styling was that the different frequency of dashes represents a different type of path (E.G. footpath, paved path, gravel path).

However, the jagged line alternative suggestions were threefold. The first main suggestion was that the deviation from the path was representative of locations with a bad GPS signal as if the map were showing a poorly recorded Strava activity. The second major suggestion was that the deviations from the path could be attributed to the persona's heart rate due to its visual similarity to electrocardiograms. The greater the frequency of deviations, the higher the heart rate.

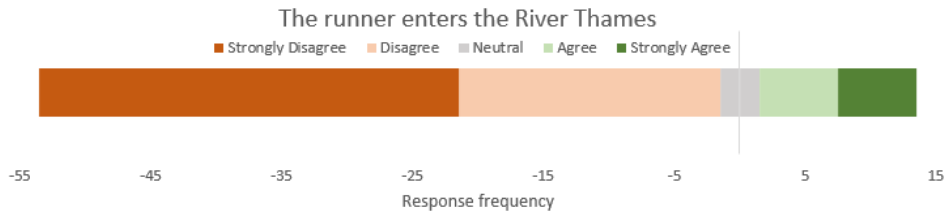



**Figure 4.2** *Survey respondents' perception whether the runner enters the River Thames when looking at the jagged line visualisation in Hurst Park*

The final main interpretation was that the runner did genuinely follow the deviation of the path. This was an anticipated interpretation of the line style. As a result, the additional statement of "the runner enters the River Thames" was given to the survey respondents as some of the runner's jags frequently traverse across land and water. It would be expected that the survey respondents do not believe that the runner swims parts of their route. This belief was shared with the respondents as shown in Figure 4.2. The mean value for the responses was 2.02, suggesting that the survey respondents did not just think the line styling was a representation of the physical location and there is another factor influencing how the lines are being portrayed.

### 4.1.2 Interpretations for each Line Style

The Friedman test was applied four times, once for each line style, to determine if there are statistically significant variations between the responses for each line styling technique. As there were three response categories (speed, acceleration, and stress) for all line styling attempts each instance has two degrees for freedom. Alongside this, the commonly accepted alpha value of 0.05 (Gilchrist & Samuels, 2014) was used to derive the Chi-Squared critical value ($\chi^2$) of 5.99. This is consistent for all the line styles. The critical value of 5.99 was determined by the Chi-Square table of critical values (NIST/SEMATECH, 2003). All Chi-Squared results ($\chi_r^2$) were below the critical value of 5.99 (deviations from the line – 3.4; variations in thickness – 0; variations in colour value – 0.4; variations in dash frequency – 3). As a result, in every instance, the null hypothesis is accepted. This means post hoc analysis was not required as there is no statistical significance that any of the line stylings were

indicative of stress, or any of the other potential justifications. A summary of the four tests can be found in Table 4.2.

***Table 4.2*** *A summary of the Friedman tests assessing the variation of survey results for each line styling technique.*

| Test Topic | Chi-Squared Decision Rule ($\chi^2$) | Chi-Squared Result ($\chi_r^2$) | $H_0$ | Outcome |
|---|---|---|---|---|
| Deviations/jags from line | 5.99 | 3.4 | Accept | No statistically significant influence between causes identified |
| Variations in Thickness | 5.99 | 0 | Accept | No statistically significant influence between causes identified |
| Variations in colour value | 5.99 | 0.4 | Accept | No statistically significant influence between causes identified |
| Variations in dash frequency | 5.99 | 3 | Accept | No statistically significant influence between causes identified |

### 4.1.3 Interpretations Between Line Styles

Depicting the stress levels of the persona's routes in Hurst Park was the aim of all the line visualisations. As a result, an additional fifth Friedman test was carried out to determine if there was any significant statistical variation between the survey responses for stress across all the line styles. Like previously an alpha value of 0.05 was used (Gilchrist & Samuels, 2014). This alpha value and three degrees of freedom result in a Chi-Squared critical value ($\chi^2$) of 7.81. Like previously, this value was derived using the Chi-Square table of critical values (NIST/SEMATECH, 2003). The output value for Chi-Square was 5.64. As this value is lower than the critical value ($\chi^2 > \chi_r^2$) the null hypothesis was also accepted. As a result, post hoc analysis was also not required. There is no statistically significant difference caused by the different line styles when depicting the stress along a route. A summary of the test can be found in Table 4.3.

***Table 4.3*** *A summary of the Friedman test assessing the survey responses to the different line styles representing stress.*

| Test Topic | Chi-Squared ($\chi^2$) critical value | Chi-Squared Result ($\chi_r^2$) | $H_0$ | Outcome |
|---|---|---|---|---|
| **Stress interpretations between line styles** | 7.81 | 5.64 | Accept | No statistically significant influence between line styles |

## 4.2 Place Ballets

### 4.2.1 Descriptive Statistics

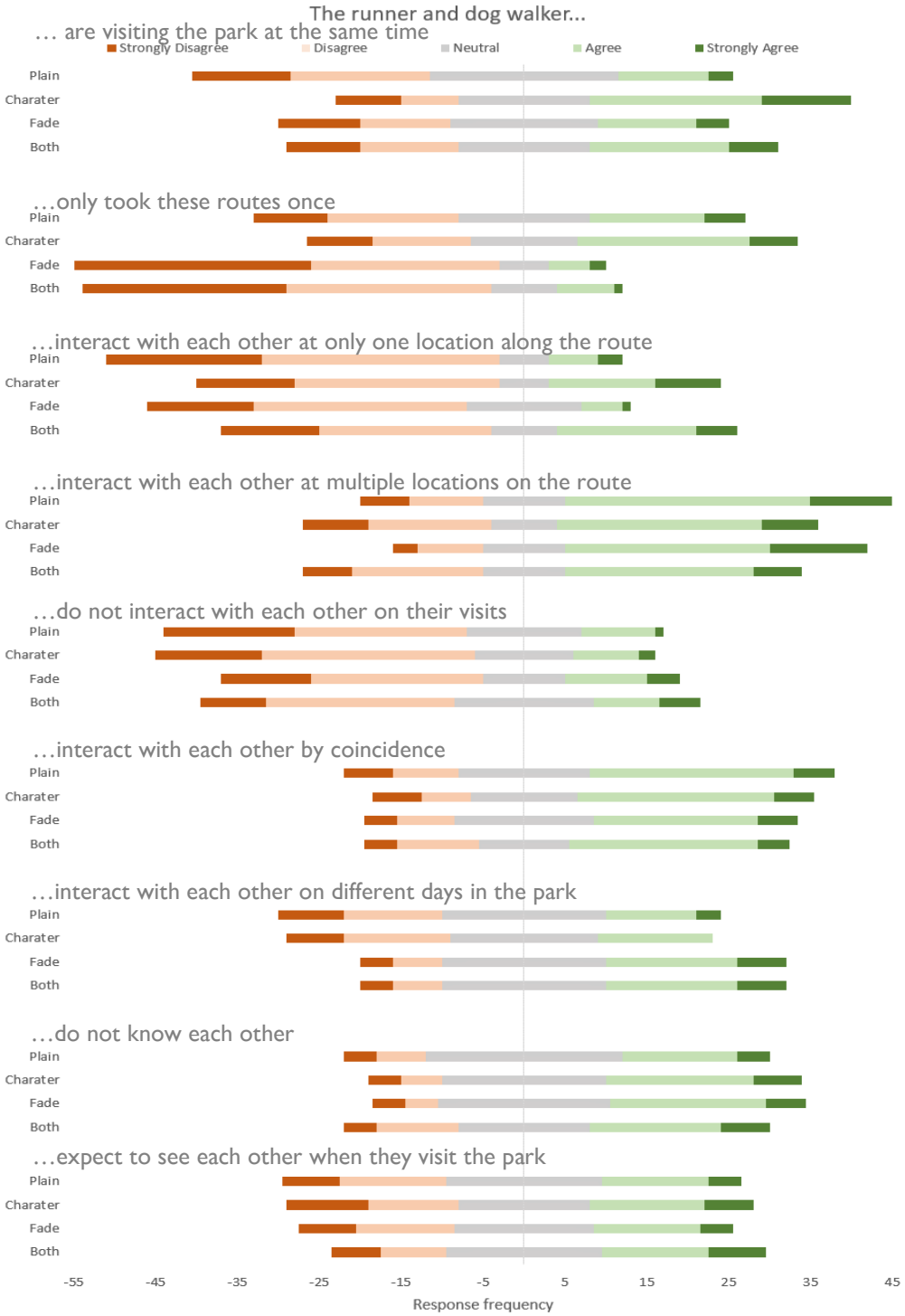



**Figure 4.3** *Survey respondents' perception changes on a place ballet with four different visualisation approaches.*

***Table 4.4*** *The mean and standard deviation of the survey responses regarding the place ballet visualisations. 1 = strongly disagree; 5 = strongly agree.*

| The runner and the dog walker… | Visualisation Type | Mean | Standard Deviation |
|---|---|---|---|
| …are visiting the park at the same time | Plain | 2.64 | 2.35 |
| | Character | 3.32 | 3.04 |
| | Fade | 2.80 | 2.54 |
| | Both | 2.98 | 2.72 |
| | Mean average | 2.94 | |
| …only took these routes once | Plain | 2.83 | 2.57 |
| | Character | 3.08 | 2.81 |
| | Fade | 1.89 | 1.67 |
| | Both | 2.00 | 1.75 |
| | Mean average | 2.45 | |
| …interact with each other at only one location along the route | Plain | 2.12 | 1.89 |
| | Character | 2.69 | 2.51 |
| | Fade | 2.24 | 1.91 |
| | Both | 2.71 | 2.50 |
| | Mean average | 2.44 | |
| …interact with each other at multiple locations on the route | Plain | 3.45 | 3.13 |
| | Character | 3.12 | 2.86 |
| | Fade | 3.60 | 3.25 |
| | Both | 3.11 | 2.83 |
| | Mean average | 3.32 | |
| …do not interact with each other on their visits | Plain | 2.31 | 2.04 |
| | Character | 2.34 | 2.06 |
| | Fade | 2.55 | 2.32 |
| | Both | 2.66 | 2.37 |
| | Mean average | 2.47 | |
| …interacted with each other by coincidence | Plain | 3.25 | 2.92 |
| | Character | 3.30 | 2.98 |
| | Fade | 3.28 | 2.93 |
| | Both | 3.25 | 2.91 |
| | Mean average | 3.27 | |
| …interact with each other on different days in the park | Plain | 2.80 | 2.49 |
| | Character | 2.75 | 2.41 |
| | Fade | 3.27 | 2.92 |
| | Both | 3.11 | 2.77 |
| | Mean average | 2.98 | |
| …do not know each other | Plain | 3.15 | 2.79 |

| | | | |
|---|---|---|---|
| | Character | 3.32 | 2.97 |
| | Fade | 3.32 | 2.95 |
| | Both | 3.19 | 2.87 |
| | Mean average | 3.25 | |
| ...expect to see each other when they visit the park | Plain | 2.89 | 2.59 |
| | Character | 2.91 | 2.66 |
| | Fade | 2.91 | 2.61 |
| | Both | 3.12 | 2.84 |
| | Mean average | 2.96 | |

Figure 4.3 visualises the responses to the statements provided to the survey participants concerning how elements of a place ballet are being portrayed in the four place ballet visualisations. Table 4.4 shows the mean responses and standard deviations for each response. The way the first statement, 'the runner and the dog walker are visiting the park at the same time' is received changes depending on the visualisation that is shown. The mean value for Plain (2.64) is considerably lower than the mean for Character (3.32). The introduction of the characters has added a temporal element for the map reader and has given the impression that both personas are both in the park at the same time. In the second statement, 'the runner and the dog walker only took these routes once' has a sharp reduction in mean value when the faded lines were introduced. Character's mean (3.08) is considerably higher than Fade's opposing 1.89. The addition of fading routes has given the impression that both personas have experienced these routes before.

In the four statements (...do not interact with each other on their visits; ...interact with each other on different days in the park; ...do not know each other; ...expect to see each other when they visit the park) there is little influence from the visualisation types as the responses remain largely unchanged. All three statements have significant 'strongly disagree' populations and the mean values for all visualisations sway towards disagree (2.47, 2.98, 3.25 & 2.96 respectively)

Just like in Table 4.1, the standard deviations are extremely high. The standard deviation values range from 1.67 to 3.25. The highest two standard deviation values, and two of only three that are greater than 3 concern the statement.

### 4.2.2 Friedman's Test

The Friedman test was applied nine times, once for each statement, to determine if there was a statistically significant difference between how the statements were perceived for each of the four place ballet visualisations. Three degrees of freedom and an alpha of 0.05 resulted in a chi-squared critical value ($\chi^2$) of 7.81. This value was derived from the chi-square table of critical values (NIST/SEMATECH, 2003). The output $\chi^2$ results can be found in Table 4.5. Three of the statements had their null hypothesises rejected. This means that the different place ballet visualisations had a statistically significant effect on how the statements were perceived. These statements were:

- The runner and the dog walker are visiting the park at the same time ($\chi_r^2 = 12.12$)

- The runner and the dog walker only took these routes once ($\chi_r^2 = 19.44$)
- The runner and the dog walker do not interact with each other on their visits ($\chi_r^2 = 9.36$)

For the remaining six statements the calculated chi-squared value was below the critical value and therefore the null hypothesis was accepted, and no statistically significant difference can be made between the visualisations for the statements.

***Table 4.5*** *A summary of the Friedman tests assessing the variation of survey results for each statement across the place ballet visualisations.*

| The runner and dog walker… | Chi-Squared Decision Rule ($\chi^2$) | Chi-Squared Result ($\chi_r^2$) | $H_0$ | Outcome |
|---|---|---|---|---|
| …are visiting the park at the same time | 7.81 | 12.12 | Reject | There is a significant difference between visualisations |
| …only took these routes once | 7.81 | **19.44** | Reject | There is a significant difference between visualisations |
| …interact with each other at only one location along the route | 7.81 | 6.60 | Accept | There is not a significant difference between visualisations |
| …interact with each other at multiple locations on the route | 7.81 | 1.56 | Accept | There is not a significant difference between visualisations |
| …do not interact with each other on their visits | 7.81 | 9.36 | Reject | There is a significant difference between visualisations |
| …interacted with each other by coincidence | 7.81 | 2.76 | Accept | There is not a significant difference between visualisations |
| …interact with each other on different days in the park | 7.81 | 3.60 | Accept | There is not a significant difference between visualisations |
| …do not know each other | 7.81 | 4.44 | Accept | There is not a significant difference between visualisations |
| …expect to see each other when they visit the park | 7.81 | 3.48 | Accept | There is not a significant difference between visualisations |

***Table 4.6*** *p-values derived from the Dunn test between each pair of visualisations to determine where the significance differences are found. Values under 0.05 are considered significant and are marked in bold.*

| | The runner and the dog walker… | | |
|---|---|---|---|
| | …are visiting the park at the same time | …only took these routes once | …do not interact with each other on their visits |
| Plain & Character | **0.001** | 0.32 | 0.9 |
| Plain & Fade | 0.43 | **1.01 x10$^{-5}$** | 0.32 |
| Plain & Both | 0.094 | **1.3 x10$^{-4}$** | 0.09 |
| Character& Fade | **0.01** | **1 x10$^{-7}$** | 0.38 |
| Character & Both | 0.12 | **1.3 x10$^{-6}$** | 0.12 |
| Fade & Both | 0.41 | 0.54 | 0.53 |

For the three statements where $H_0$ was rejected and a statistically significant difference was detected, post hoc analysis was carried out in the form of a Dunn test. Table 4.6 shows the resulting *p*-values for every pair combination of visualisations. In two of the three instances, significant differences could be pinpointed. Plain & Character ($p = 0.001$) and Character & Fade (0.01) for "...are visiting the park at the same time" both had *p*-values below 0.05. The *p*-value drops below 0.05 in four instances for "...only took these routes once". The times the *p*-values was greater, and no significance found, were for Plain & Character (0.32) and Fade & Both (0.54). The lowest *p*-value of all was found for this statement between Character & Fade ($1 \times 10^{-7}$). No significant differences were found between any pair for "...do not interact with each other on their visits".

### 4.2.3 K-Means Clustering

Resulting from a K-Means clustering analysis, the coordinates of the predicted place ballet locations were plotted on each visualisation attempt. For clarity, the base maps have been removed in the following four figures.

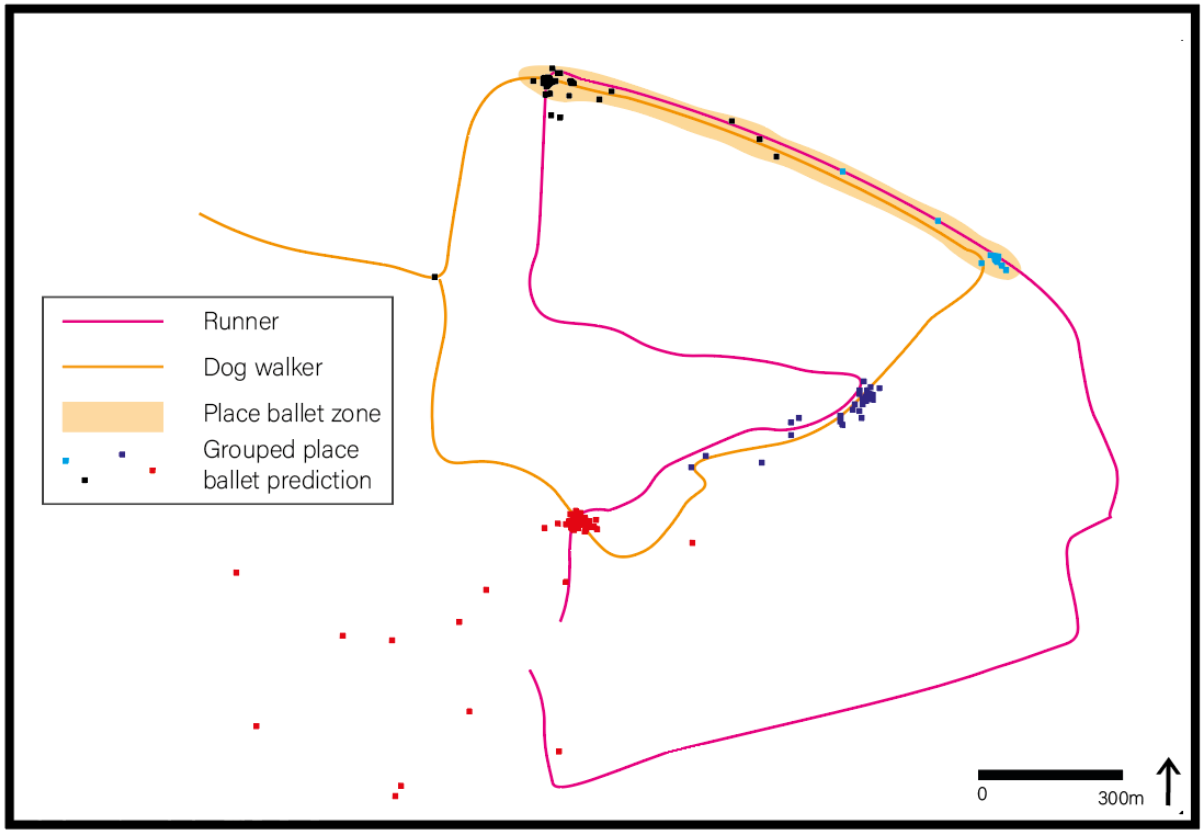



**Figure 4.4** *Clustered predictions of where the place ballet between the runner and the dog walker occurs on the plain routes map.*

Figure 4.4 shows the locations where the survey participants predicted the place ballet location between the runner and the dog walker is. Four cluster groups were identified and of the 142 predictions, 61 (43%) fell within the area where the place ballet is expected to occur. Two cluster groups contained points that were within the place ballet zone. Most predictions across the map were located were the two route lines converged or crossed. This is true for the place ballet zone too where either cluster was focused on the converging points at the extreme ends of the zone. 70% of survey respondents plotted at least one place ballet location; 64% plotted at least twice; 36% made 3 or 4 predictions and 20% of respondents predicted that there were four place ballet locations on the map.

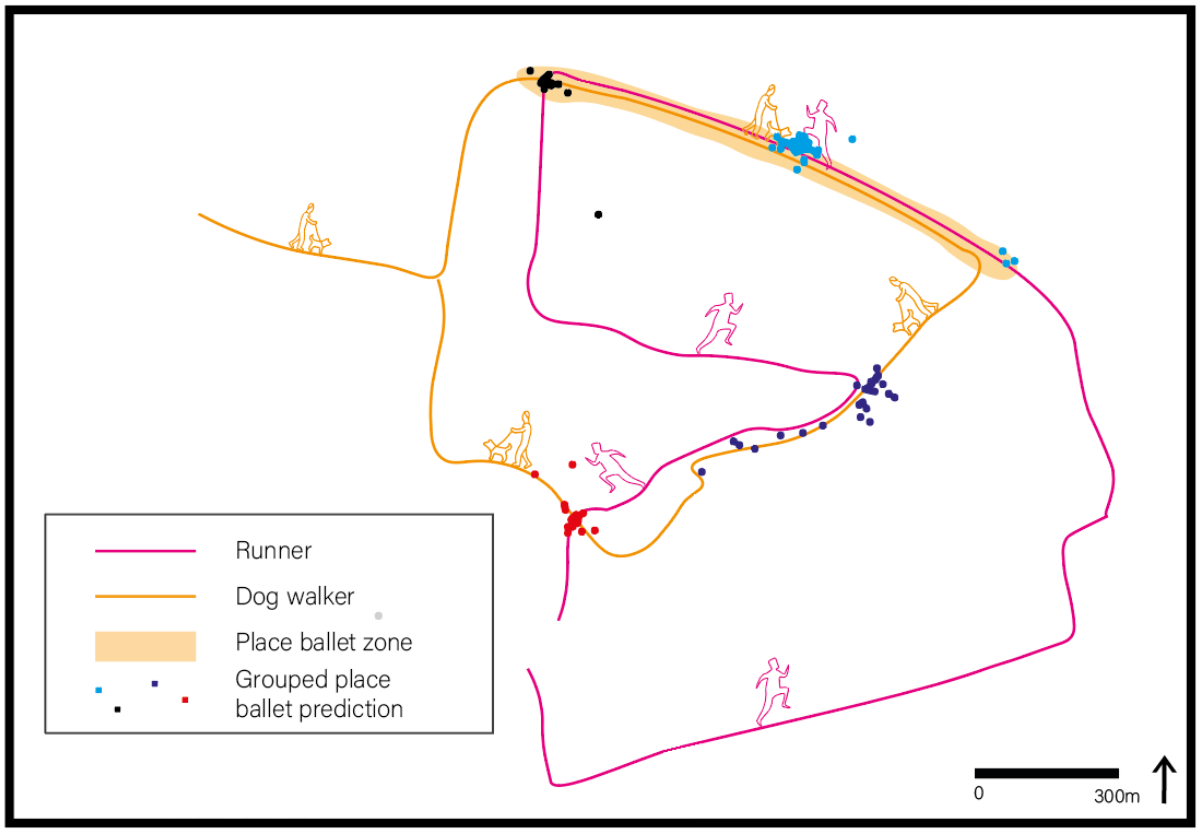



**Figure 4.5** *Clustered predictions of where the place ballet between the runner and the dog walker occurs on the plain routes map with the addition of characters.*

Four cluster groups were still found with the addition of characters (Figure 4.5) however one of the groups had migrated to the centre of place ballet zone due to the placed characters who were converging with each other. There is no significant change from the locations of the other clusters. As a result, two cluster groups remain in the place ballet zone and 55 of the 113 predicted locations (49%) fell within this zone. Due to the prominent cluster at the characters (light blue), the size of the other clusters reduced. Respondents became more confident in their location choices as only 9% of survey respondents made four guesses at the location of the place ballet, a reduction from 20% in the initial visualisation.

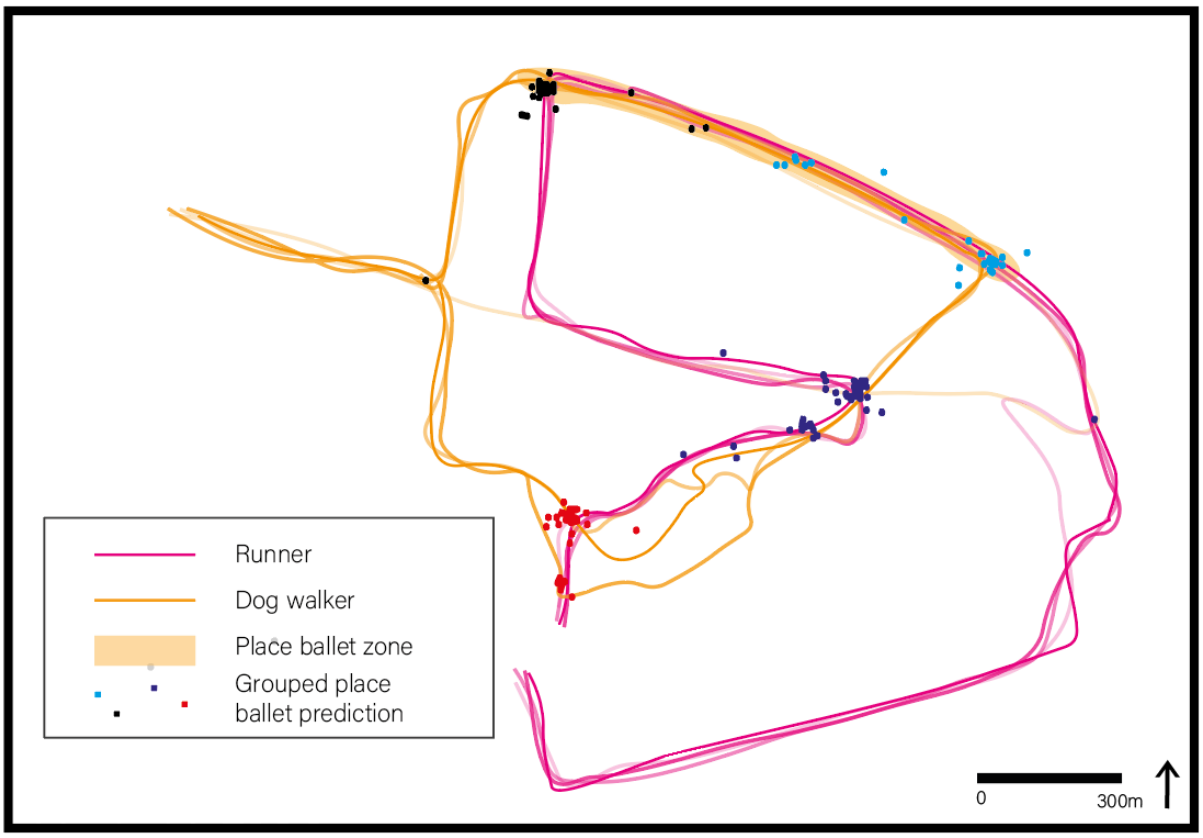



**Figure 4.6** *Clustered predictions of where the place ballet between the runner and the dog walker occurs on the plain routes map with the addition of faded, past routes.*

With the faded routes (Figure 4.6), four cluster groups remained. The light blue group migrated back to the eastern end of the place ballet zone like that of the initial map. There was a reduction of locations that fell into the place ballet zone with only 41 out of 150 (27%) being correctly placed.

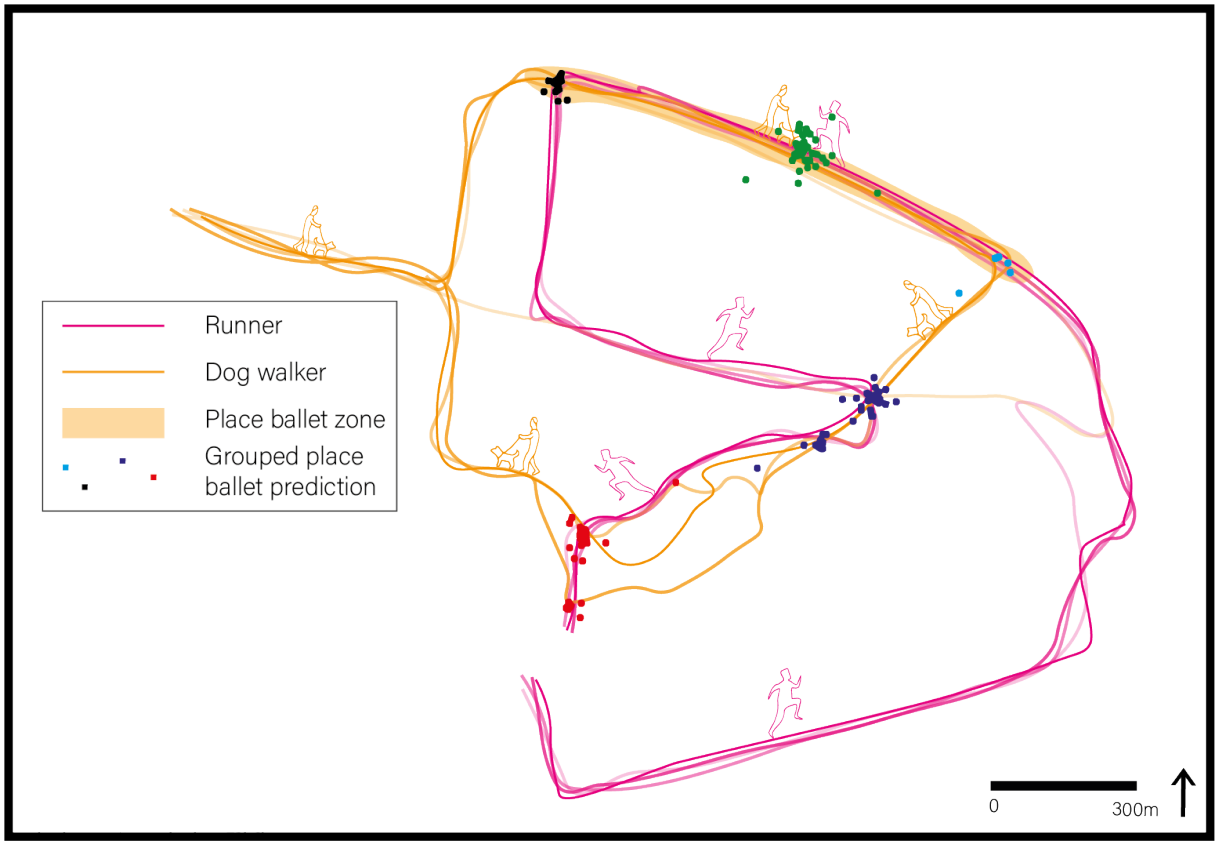



**Figure 4.7** *Clustered predictions of where the place ballet between the runner and the dog walker occurs on the plain routes map with the addition of characters and faded, past routes.*

In the final map, displaying both the characters and faded routes (Figure 4.7) five cluster groups were found. The same locations remained but the light blue group had split into two clusters, one on the eastern edge of the place ballet zone and another at the point where the two character depictions are converging. As a result, there are three clusters located in the place ballet zone with 76 out of 112 (68%) markers falling within the place ballet zone. This is the highest percentage of correctly guess locations across the four visualisation attempts.

## 4.3 Map Styling

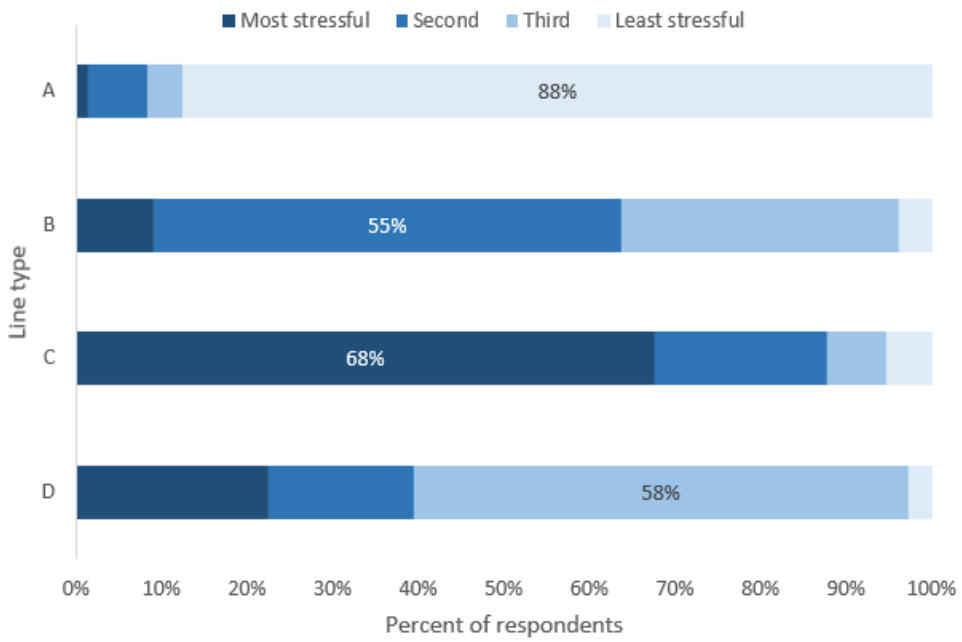
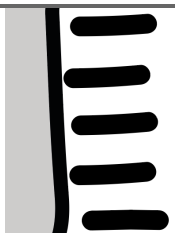
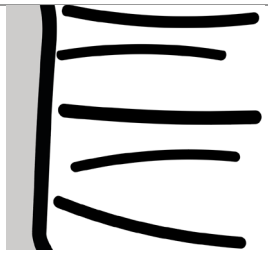
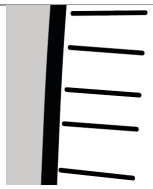



***Figure 4.8*** *Survey respondents' perceptions on which line style is indicative of the most stress.*

Figure 4.8 shows the breakdown of the responses given by the survey participants concerning which line styling infers the highest level of stress. For each level of the hierarchy, there was a clear favourite with one style receiving over 50% of the vote at each stage. Over two-thirds (68%) of the respondents selected line type C as the style that indicates the greatest stress. When selecting the line style indicating the 2nd highest magnitude of stress, line type B amassed 55% of the votes. For the line style depicting the third most stressful line style, D got 58% of the votes. By the biggest margin, line style A was ranked as the least stressful with 88% of the votes. Table 4.7 shows an overview of the ordered hierarchy of the line styles depicting stress levels.

**Table 4.7** *The ranked positioning of radiating line styles depicting the most to least stress.*

| Rank | Style | Example | Percentage selected at this rank |
|---|---|---|---|
| 1st – Most stressful | C |  | 68 |
| 2nd | B |  | 55 |
| 3rd | D |  | 58 |
| 4th – Least stressful | A |  | 88 |

# 4.4 Park Affordances

## 4.4.1 Descriptive statistics

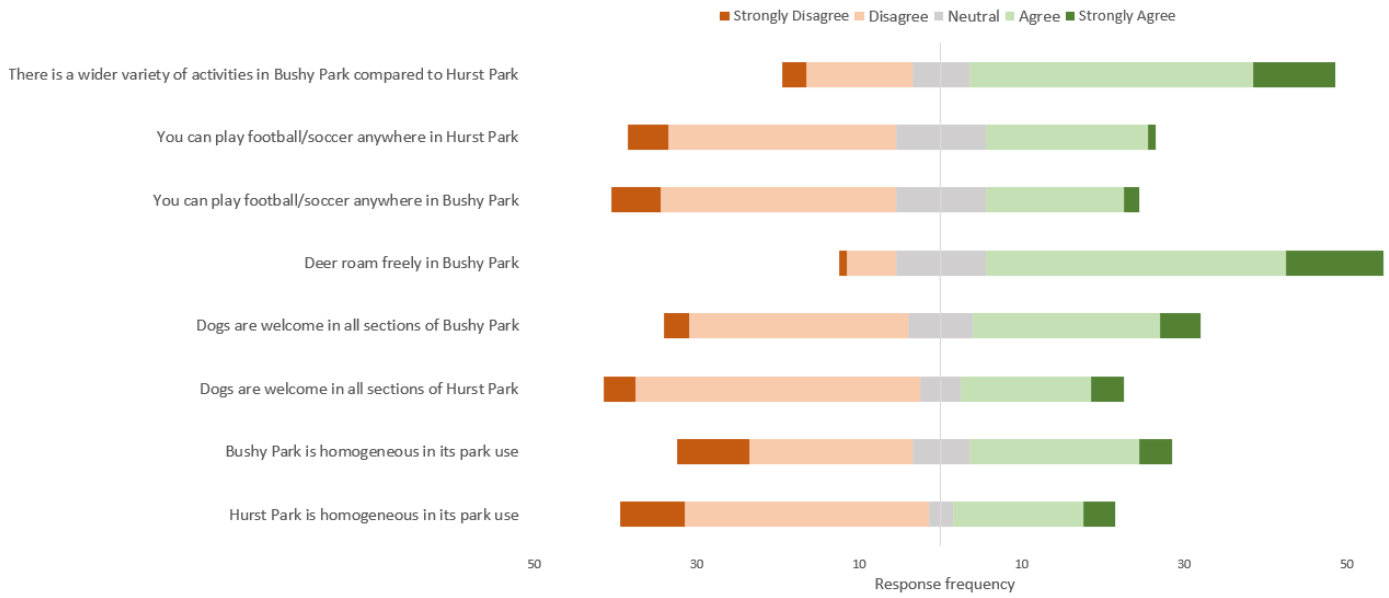



**Figure 4.9** *The responses to the statements made regarding the affordance map visualisations of Bushy and Hurst Park.*

**Table 4.8** *The mean and standard deviation of the survey responses concerning the perceived affordances of both parks from the affordance maps. 1 = strongly disagree; 5 = strongly agree.*

| Statement | Mean | Standard Deviation |
|---|---|---|
| There is a wider variety of activities in Bushy Park compared to Hurst Park | 3.53 | 3.18 |
| You can play football/soccer anywhere in Hurst Park | 2.75 | 2.42 |
| You can play football/soccer anywhere in Bushy Bark | 2.69 | 2.38 |
| Deer roam freely in Bushy Park | **3.79** | **3.37** |
| Dogs are welcome in all sections of Bushy Park | 3.00 | 2.69 |
| Dogs are welcome in all sections of Hurst Park | 2.70 | 2.41 |
| Bushy Park is homogenous in its park use | 2.85 | 2.61 |
| Hurst Park is homogenous in its park use | 2.64 | 2.40 |

Figure 4.9 visualises the responses to the statements provided to the survey participants regarding the two affordance maps of Bushy and Hurst Park. "There is a wider variety of activities in Bushy Park compared to Hurst Park" was strongly agreed upon and has a mean value of 3.53. This inference is incorrect when comparing the number of affordances represented in the two maps. As previously shown in Table 3.2, Hurst Park has eight mapped affordances compared to Bushy Park's six.

"Deer roam freely in Bushy Park" had the strongest conviction on all Likert responses in this study. This is numerically proven with the highest mean value of 3.79 which is displayed in Table 4.8. The respondents were correct to infer this information from the map as the deer in Bushy Park are free roaming, apart from in the Woodland Gardens. The deer icon was placed arbitrarily eight times across Bushy Park to try and give the impression of a free-roaming affordance. The lack of any marked, explicit borders or boundaries may also have contributed to its agreeable score.

Of the eight statements, there were three sets of comparative statement pairs. According to survey respondents map impressions, Hurst Park is marginally better for all access football than Bushy Park (mean value of 2.75 compared to 2.69). Bushy Park is regarded as more homogenous (2.85) than Hurst Park (2.64). Finally, Hurst Park (3.00) is more welcoming in all areas for dogs than Bushy Park (2.70).

### 4.4.2 Students T-Test

***Table 4.9*** *A summary of the Students T-Tests carried out on the comparative statements regarding the affordances in Bushy and Hurst Park.*

| Statements | Critical Value | *p*-value | $H_0$ | Outcome |
|---|---|---|---|---|
| Bushy/Hurst Park is homogenous in its park use. | 0.05 | 0.0022 | Reject | There is significant difference between the two statement responses. |
| Dogs are welcome in all sections of Bushy/Hurst Park. | 0.05 | 0.066 | Accept | There is no significant difference between the two statement responses. |
| You can play football anywhere in Bushy/Hurst Park. | 0.05 | 0.10 | Accept | There is no significant difference between the two statement responses. |

Table 4.9 shows a summary of the T-Tests concerning the statements regarding the affordance map visualisations. Of the three comparative statements, only one resulted in a *p*-value below the critical value and thus meaning that there is a statistically significant difference in the responses to the statements. As a result, it can be inferred from the two maps that the survey respondents believed Bushy Park to be more homogenous in its use than Hurst Park is (*p*-value of 0.0022 is less than the critical value of 0.05). For the other two comparative statement pairs, there was no significant difference to distinguish a difference between where dogs are welcome in either park ($p = 0.066$) and if you can play football anywhere in either park ($p = 0.10$).

# 5. DISCUSSION

This chapter investigates the meaning of the found results and addresses RQ2&3. The first four subchapters each assess a sub-question of RQ2 (Which cartographic means can be employed to provide better visualization of the identified phenomena?). Then, the fifth and final subchapter evaluates RQ3. (Do the new visualization techniques better communicate the sense and identity of a place? Why do they/do they not do this?) It also looks at the contributions and limitations of the study as a whole and the potential future research directions that could be explored.

## 5.1 Line Styling

The following results that are discussed here address RQ2A: how can a line be styled along a route to convey the changing sense of place? The results show that the thickness, value and dash line styling approaches do not intuitively communicate platial information and are unsuitable to depict a changing sense of place. Potential reasoning for both the thickness and dash styles alternate suggestions can be linked to traditional topographic maps. Larger and busier roads are typically depicted as wider than smaller and quieter roads. Topographic maps also commonly use different line dash frequencies to mark the difference in path type (cp., Ordnance Survey, 2014; Falk Verlag, 2017; Harvey Maps, 2018). As a result, both these styles are making the map viewer draw connections with spatial information and visualising the physical space the persona is travelling through. As a result, these maps are not idiosyncratic as the path type or width does not change depending on the persona. Every persona taking the same route would generate the same map. The maps being created are intended to convey platial, not spatial, information.

The thickness line styling method, as well as the disassociation from the sense of place, came with drawbacks. The line was drawn with the general rule of thumb: the greater the stress, the thicker the line. As a result, the stressful areas ended up being blocked out with a thick line, often obscuring the other map symbology which may be the cause of the experienced stress. This can be seen in Figure 3.6 where the symbol for the car park in the centre-north of the map is obscured by the runner's thick line. This example of the obscuring of surrounding symbology is on a relatively uncomplicated map. With significantly more map features and symbols, it will be even harder to identify the cause of any perceived stress. Ultimately, this is an additional reason why the thickness line styling is an unsuitable method to communicate a sense of place.

However, the jagged style, although unsuccessful at conveying platial information, looked the most promising in doing so. One of the three main alternate suggestions was that the deviations of the path represent a persona's heart-rate due to its visual similarities to an electrocardiogram. This interpretation carries platial information as it is describing how the person is experiencing the place. Different personas will have different heart rates as they travel through the park with different triggers that can influence it, of which, stressful triggers could be one. The rejection of the notion that the jagged line was representative of the exact path the runner took (mean value 2.02) meant that it was perceived that there was an additional factor influencing the way the line was portrayed.

In summary, different line styling methods can convey additional information alongside the location of a route. However, attributing that meaning to platial information remains a challenge. Further research is needed to identify styling methods that invoke connections to platial rather than spatial information, a pitfall of the four tested methods. The jagged styling showed that platial connections can be made but it is still not explicit enough in its platial meaning and depicting the changing sense of place.

## 5.2 Place Ballets

This portion of results assessed RQ2B: how can place ballets be depicted on a map with maximum detail? The analysis of the results has been broken down into two sections. The first looks at the characteristics of the place ballets, focusing on how the survey participants reacted to the statements they were provided about the different visualisations. The second looks at how the survey participants predicted the location of the place ballet with the different visualisations.

### 5.2.1 Characteristics of the Place Ballet

Of the nine statements provided to the survey participants, only three had their Friedman test null hypothesis rejected and a statistically significant difference between the interpretations of the four visualisations was found. For the other six statements, the changes in influence did not significantly influence the way they were interpreted. Referring to Table 3.4, both temporal statements showed change. One of the five interactional statements showed significant change and zero of the two geographical statements had any statistically significant change. As a result, the proposed visualisation techniques were successful in increasing the context of the temporal element of a place ballet. There was limited success in improving the interactional understanding of the place ballet and no success in improving the map readers understanding of the geographical features of the place ballet.

Post hoc analysis using the Dunn test allowed a greater insight into which specific map features had caused the statistically significant differences in how the statements were responded to. For the statement 'the runner and the dog walker are visiting the park at the same time' the two pairs of maps with *p*-values below the critical value of 0.05 were, 'plain' & 'character' (0.001) and 'character' & 'fade' (0.01). Of the three named visualisations, 'character' had the highest mean value (therefore, more weighted to 'agree'). The addition of the character icons to the map was the mutual difference in both sets of pairs and it can be deduced that they cause the impression that both park personas are visiting the park at the same time. The introduction of the characters had added a temporal element for the map reader and has given the impression that both personas are both in the park at the same time. The only pairing where character's *p*-value is above 0.05 is with 'both', but in this instance, they both contain the character icons so a difference in interpretation regarding this is not expected. This conclusion is in line with Antoniou et al (2015) and Desclaux-Salachas (2017) as the character icons root the map into a scene occurring at the same time and start a narrative.

The statement "the runner and the dog walker only took this route once" resulted in the highest value in the Friedman test (19.44), indicating the greatest difference between the different maps. This can also be seen visually by the dissimilarity of the bars for this statement in Figure 4.3. In the Dunn test,

four of the six map couples had *p*-values below 0.05. The lowest value ($1 \times 10^{-7}$) was between 'character' and 'fade'. The mutual difference between all pairs of maps that has a *p*-value lower than 0.05 was that one of the maps had the faded lines map feature (either 'fade' or 'both') and the other did not ('plain' or 'character'). As a result, it can be deduced that the faded lines made it clear to the map reader that both the personas have used this route multiple times. This can be used in a place ballet visualisation to indicate that any interaction is not a coincidence and the chance of the personas meeting have occurred on multiple different occasions.

The other statement with a rejected null hypothesis in the Friedman test was "the runner and the dog walker do not interact with each other on their visits". No *p*-value from the Dunn test was below the critical value of 0.05. The lowest value 0.09 ('plain' and 'both') would have satisfied a confidence interval of 10% but it is not significant enough for this study.

The two temporal elements examined in this study were successfully visualised using simplistic visualisation methods to intuitively communicate information about the place ballet occurring between the runner and the dog walker. The geographical and interactional features are still a challenge to communicate. These results build on the existing evidence that place ballets are difficult things to visualise on a static map (Seamon & Nordin, 1980; Eck & Pijpers, 2017). However, the temporal element of a place ballet can be represented by using methods of illustrative mapmakers such as the addition of character figures in the map which are common in Hotchin (n.d.), Hunt (n.d.) and Seki's (n.d.) work.

Further research should be undertaken to build on what has been established. How to visualise the geographical and interactional elements of a place ballet needs to be better understood and this may be achieved from further visualisation attempts. These successful future visualisations could be inspired by the world of art and illustration or from another domain.

### 5.2.2 Locations of the Place Ballet

This section of results focuses on the impressions from the map readers regarding where they felt the place ballets were occurring. All four of the maps had a minimum four clusters of place ballet location guesses. With every result, the overwhelming majority of these points, and all clusters, were located when the paths converged or crossed each other. At these locations, the personas could be physically close to each other, allowing for interaction.

The map 'both' had the highest percentage of points plotted within the place ballet zone (68%). The second highest was 'character' (49%) before plain and fade in third and fourth (43% and 29% respectively). This means that the platial visualisation attempt for 'fade' was distracting to the map reader and detrimental to the locating of place ballets. The 'character' visualisation generated the largest cluster in a centralised position in the place ballet zone due to the two opposing character depictions. This marries nicely with Antoniou et al (2015) and Desclaux-Salachas's (2017) work whereby character depictions are the driving force behind a narrative within a map.

Each survey respondent was given up to four opportunities to plot locations of potential place ballets on each map. They intentionally were not told how many place ballets occur between the runner and the dog walker. Due to the four opportunities, survey respondents may have felt compelled to plot four

locations. If so, this may have weakened the strength of the results as they were plotted more out of obligation then choice.

There is a smattering of plots distanced from the route lines, most commonly in the bottom left of the map. It is assumed that these predictions were made in error as the prediction markers were dragged from the bottom left of the map. This can be seen in the survey screenshots found in Appendix B. These plot locations become less frequent in the subsequent maps. It is assumed the survey respondents became more familiar with how the question interface operated.

The order in which the maps were shown in the questionnaire may have influenced the predicted locations. A minor cluster of points plotted on the fade map (Figure 4.6) is located at the same spot as the light blue cluster in the preceding map depicting the character figures (Figure 4.5). This is unexpected as there are no clear visual stimuli for this selection other than the information depicted in the previous map.

Going forward, a closer inspection into the depictions into how line stylings represent the direction and speed of travel of each persona can also influence the location estimates of place ballets. Such a study could be conducted in tandem with further line styling techniques previously discussed in this thesis.

### 5.2.3 Place Ballet Summary

Place ballets are still a challenging platial feature to visualise but ways in improving their depiction have been identified. Eck & Pijpers (2017) map depicting place ballets (Figure 2.2) could be enhanced by the addition of some of the visualisation techniques identified instead of relying on the supporting text for context. For example, the faded lines can indicate to the map reader that these routes are repeated and part of a routine. Character depictions could also be used to establish that the park visits are at the same time whilst also aiding in the location of the place ballets. However, there are elements of the place ballet, such as geographic and interactional elements, that visualisation techniques still need to be better developed for a stronger communication. This is where future research is needed to to create more rounded and context-rich place ballet depictions.

## 5.3 Map Styling

This section of results assessed RQ2C: To what extent can the map style communicate the atmospheres of sub-regions? Table 4.7 shows the hierarchy of radiating line styles conveying a stressful atmosphere in order of pervasiveness. The hierarchy of different radiating line styles has built upon the binary presence of lines on Eck & Pijpers (2017) cartographic visualisation of atmosphere. The different levels of styling give greater ability to the mapmaker to communicate relative atmospheres. The map reader can now also quickly identify areas of particularly intense or little atmosphere.

The results are limited by a series of assumptions. It is assumed that the perception and alertness of potential danger for a parent caring for a young child can be translated into a broader sense of atmosphere. This may not be the case and further studies should be conducted to determine if this inference can be made. The results are also communicative for stressful, negative emotions and

atmospheres. It is unknown if the styles convey the magnitude of any atmosphere or if there are better styling methods for positive atmospheres. This is also a research avenue that could yield insightful results. Finally, another research direction is to break away from the black and white map style used by Eck & Pijpers (2017) and assess other visual variables, such as colour and value (Roth, 2017).

## 5.4 Park Affordances

The final part of the study assesses RQ2D: Which visual variables are best suited to convey the affordances of sub-regions in the park? This was addressed by the creation of two maps, one of each park, both with a map layer of continuous affordance icons in the background of the map to give an impression of the affordances and subregions that can be found in the parks. To test the effectiveness of the visualisations eight statements, including three pairs that contradict, were put to survey respondents to see how they were interpreted.

Of the three pairs of contradicting statements, the Student's T-Test only identified one pair with a statistically significant difference. This pair was that Bushy and Hurst Park are homogenous in their park use ($p = 0.0022$). Due to Bushy Parks higher mean value (2.85 to 2.64), the maps depicted Bushy Park as a more homogenous space in its affordances than Hurst Park. From the interviews collected earlier in the research, it is known that this is not true. At first glance, Bushy Park on the map may look like it has more affordances due to it having less defined subregions than Hurst Park, where repeated symbols are more common. Because of the constant change in neighbouring symbols, it may have given the impression there were more affordances even if this was not the case. Similarly, it was found that the difference in subzones was not significantly different in both parks, this was also not the anticipated conclusion. Hurst Park is certainly more welcoming in the dog walking sub-region, but it was uncovered during the persona creation that outside of this zone dogs were less welcome, and the affordance map layer has failed to communicate this.

To build on this section of research, more knowledge is needed in making distinctions between subregions. This research has shown it is easier to represent areas of inclusion by repeating icons than it is to show exclusion. How to better visualise the affordances in areas such as the Woodland Gardens in Bushy Park where dogs and cyclists are not allowed, to be established. For an idiosyncratic map tailored to a particular person, such as the cyclist, removing the Woodland Gardens off the map entirely may be a method to represent a lack of affordance there for them. More research would need to be undertaken to understand the effectiveness of this approach.

## 5.5 Overview

The final research question (RQ3) was: do the new visualization techniques better communicate the sense and identity of a place? Why do they/do they not do this? Within this chapter, research questions, 2a-d has been assessed. Combined, their answers make up the response for RQ3 and evaluate how successful the attempts at visualising platial features have been. For line styling, using the jagged line style has shown to be the most likely to successfully communicate stress and a changing sense of place along a route. Place ballets have developed techniques to communicate their temporal nature and location. A hierarchy of radiating line styles has been established that enables the mapmaker to better

communicate relative levels of experienced stress and atmosphere. Finally, the use of a subtle icon layer has enabled the mapmaker to better convey the affordances of subregions within a defined area.

The influence of the COVID-19 pandemic on the methods, and how it shaped the research has already been mentioned in Section 1.4. Another limitation of this research is that the reported data refers to the population as a whole. It does not account for any potential demographic differences or patterns in visualisation perceptions. With the current sample size, it would have been improbable to detect any statistically significant demographic patterns. With a larger pool of survey respondents, the opportunity to identify demographic changes becomes more achievable.

For further research, it would be advised to pick one of the four directions and see how far it can be developed. Avenues for further research have been stated in the previous subchapters. These research directions can build on, or, continue the use of the study sites and personas found in this study as the list of identified subregions or persona perceptions have not been exhausted. The cyclist persona was used in the experimental stage of visualisations but no formal visualisations of theirs were put forward to be examined. The 'choke point', as described by multiple interviewees (seen in Figure 3.4) is an area of strong, idiosyncratic platial features which was also used in a limited context in this study. This can still be used in further visualisation experiments.

# 6. CONCLUSION

This study intended to improve the visualisation of platial features. That is, to raise a better understanding of new techniques that are accessible to all map makers wanting to better communicate platial features in their maps, regardless of their academic field. An improvement of these visual techniques to describe platial features detracts from the over-reliance on supportive text as the communication method, whilst also decluttering maps of text within them. RO1 was concerned with identifying the need for improved cartographic platial depictions. This was met through highlighting the shortfalls of the maps created by Seamon & Nordin (1980) and Eck & Pijpers (2017) that have been referenced throughout this study. The literature review assessed elements of platial features and the different methods in which they are depicted. Four areas were identified as needing improved cartographic visualisation techniques. These areas where: depicting the changing sense of place along a route; place ballets; changing atmospheres between subregions and how best to depict the affordances of these subregions.

RO2 was to generate and understand cartographic techniques to better convey platial aspects. Inspiration was taken from illustrative mapmakers to assess the effectiveness of techniques used to depict a place. This study has identified that of the four proposed line styling methods to depict the changing sense of place, three of them were unsuitable ('dash', 'thickness', and 'colour value'). This was because instinctive associations between the techniques were being made with spatial, rather than platial, relationships. However, the jagged line styling attempt shows more promise in platial depictions.

Depicting place ballets remains a difficult task but a greater understanding of how to show the temporal nature of place ballets has been achieved. This can be attained by the addition of faded lines and the inclusion of character depictions. Representing geographical and interactional elements of place ballets remains a challenge. A hierarchy of radiating line styles, similar in style to Seamon & Nordin (1980) map outputs, has been created. This enables the mapmaker to have a greater understanding of how to convey relative and changing atmospheres between subregions in their maps. Finally, the use of a subtle affordance map layer can give the map reader an impression of the affordances found within subregions of a map. This is currently more successful in depicting the affordances in homogenous regions than heterogeneous areas. These developments and techniques in cartographic platial visualisation are accessible to any map maker, regardless of experience, to better communicate their places visually.

The four research directions of this thesis were bountiful in research opportunity. Each direction could have had its own thesis written about it! Examples of improvements that follow on directly from this research have been identified and discussed in Section 5.5. It is possible to continue the use of the study sites and personas found in this research. Plenty more persona perceptions and subregions remain to be explored and used for visualisation experiments such as the cyclist and the chokepoint.

More broadly, further research should focus on place ballets and improving their cartographic visualisation. There is plenty of room to increase visual development, making them as context-rich as possible whilst removing the reliance on supporting text. Another area for future research is to test if these visualisations carry the same inferences in different settings. Breaking away from a park environment and testing in other public settings such as marketplaces and busy shopping streets. Market places are areas where place ballets are commonly found as reported by Seamon & Nordin (1980). Are the generated techniques effective here too? Being able to conduct in-situ user tests in a post-COVID world could be employed to see how map readers interpret the map as they navigate around a location such as a marketplace. Tests to see if they would alter routes to avoid areas marked as stressful, based on the visualisations, would be able to show the suitability of these visualisation techniques in marketplaces and other spaces.

If the maps are successful in influencing navigation, or influences the subregions a person visits, they have potential applications in recreation and tourism mapping. Different maps could be created for different groups of tourists with different interests so that the map leads them to the areas with the affordances most suited to them. This could be done on a small scale in a park like Bushy or trialled on a much larger scale in cities.

Another direction for further research could be to find a real-life community, similar to the one used in Eck & Pijpers (2017) study and test how effective the new visualisation techniques are at depicting these relationships to place. This would then put the visualisations to the test in a real-world example rather than using personas, regardless of how representative they may be. Furthermore, studies on how to combine the four research directions onto one map depiction should be made. Currently, the technique to depict areas of perceived danger or stress is in black and white whereas the place ballet depiction uses colour. How is it possible to introduce colour to the radiating stress lines without detracting from its platial meaning? Another area where the combination of techniques may cause difficulty is if the jagged line styling and place ballet visualisations are merged. The perceived location of place ballets was identified more often where the two persona lines crossed. The addition of large jags may increase the number of times each persona's route is depicted to cross and as a result, confuse the map reader as to where the place ballet is. If this is the case, then further testing would be required.

These visualisation methods have the potential application of documenting a person's relationship with a place. This provides another way to communicate a platial relationship and a person's idiosyncratic relationship with a place. If data from multiple users are considered together it may become easier than verbal or written communication to identify trends and patterns of how the place is experienced. Emerging patterns could be used for further action. If the data suggests users elicit positive relationships with the place, the influencing affordances could be maximised by creating more of them. If a negative relationship is identified, adjustments could be made to minimise this and improve the place. Therefore, as discussed in Section 2.2.1, where Aalbers (2014) discusses how maps can influence geography. Maps with these new platial visualisation techniques could just do that.

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# APPENDIX

## A – Full Interview Transcripts

All names and identifiable features have been changed. The interviewee's responses are in *italics.*
**Anonymised name (gender, age-range) date/of/interview – method**
HP = Hurst Park; BP = Bushy Park; PB = Place Ballet

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**Adam (M 20's) 29/05/2020 – In person**

~~~~~Introductory small talk~~~~~

So, we are sitting in Bushy Park, which you are a regular user of?
*Yes.*
What is the regular use that you use Bushy Park for?
*I use it mostly for Park Run on Saturday mornings.*
How frequently would you say you do the Parkrun?
*Infrequently [laughs] Every week for 3 or 4 weeks and then not at all for a few weeks.*
So, we have just completed a route of your route starting at the Hampton entrance of Bushy Park.
*No, the Hampton Court entrance.*
Hampton Court entrance, thank you. And we have completed an approximate 5k route around the Parkrun course and noted where the start and the finish were. Which was very helpful to help jog your memory as well as help picture things for me later in the process. So, could you briefly describe Parkrun is please?
*So yes, it's a 5k timed run that is free to do every Saturday for free and Bushy Park is the most popular one. It averages about 1,000 and 1,500 each week do it. It's a specific route that you do around the park and you get given a time at the end.*
1,000 to 1,500 sounds like an awful lot.
*There was about 3,000 at the last Christmas one.*
That sounds quite busy. As you enter the park, do you sense an atmosphere on morning, a bustling community feel as it were?
*Yes, there is definitely a lot of people stretching and exercising. There's a lot of like people from different households and family members that do it together so there is a lot of chatting and catching up.*
So, there's lots of people greeting people they haven't seen and catching up?
*Yeah, I tend to do it with my family, some of my dad's friends do it and so we talk to them.*
So, would you say you have become more familiar and developed friendships with other runners as well as improve relationships with family or friends?
*Well there's some people who I don't know on a name basis, but there are a few people we give some small talk that we see before the run. There's Marshalls all along the run that tell you what direction to go and I recognise some of them like on one corner there is a sort of middle aged woman who marshals with her elderly mum and her mum sort of sits down next to her and waves at all the runners as they go past. Which is kind of cute.*
Would you say it's a nice sense of community or feeling when you run past them each run?
*Yes.*
~~~~~

Would you say you'd feel a certain sort of sadness or sort of uncertainly and unease if either didn't see both of them or just the marshal alone. Would that make you concerned?
*Yeah, she is very old. I would wonder why she is not there and hope she is ok. I would notice if she wasn't there.*
Where abouts on the route are these marshals usually positioned?
*By the Sandy Lane gate.*
Okay, thank you. That's all very interesting. It sounds like you have a good place ballet there thank you for sharing. So, let's talk about the run itself. Could you talk us through the beginning of the run?
*At the start there's a relatively thin path to run along so it's very crowded before everyone's separated like they are closer to the end. It could be considered claustrophobic at one point and once on run somebody tripped me up and I cut my knee and I wasn't able to finish the race.*
That doesn't sound good. Would you say you're more cautious at the beginning then? Or would you run slower than you normally would without anyone surrounding you?
*Definitely I am more cautious. I have somewhat limited eyesight in my left side. I am extra cautions on that side and make sure no one overtakes me on that side.*
Then as you progress through the route are there any favourite parts of the route or parts of the route you enjoy more?
*There is, near the end of the route there is quite a big lake which is quite nice running along there and at that point of the race it is quite spread out, quiet and peaceful.*
I see here we are sort of at the start and the finish point. Around us there is a road, a car park. From past experiences there is an ice cream van and there is a child's play park. From what your describing its sounds a lot more relaxing and screening and at lot less crowded then here.
*Yes, for most of the route there is mostly nice views and peaceful but its more crowded here.*
Ok thank you. Along the route are there any facilities you can use such as a water table or a toilet?
*No.*
After the run do you spend more time in the park? What do you do at the end of a run?
*Sometimes we co for breakfast but that's no longer in the park. We go with the people that meet in each week like my dad's friend.*
How do you travel to the Parkrun?
*We either walk or cycle. Never drive. It's impossible to get a parking spot. I spoke to one person when I was in the queue to get my barcode [to record running times] they said they have to arrive an hour before it starts to guarantee a spot.*
Wow.
Do you think there would be any definable sub regions along the route?
*What does that mean?*
So, for example do you think the start and the end have a similar feeling compared to parts in the middle.
*I think when I start running down chestnut avenue that's about a third of the way through. It's not quite the home straight but it feels like I'm almost there. Approaching the end. It motivates me as I know that most of it is completed. But the tarmac bit just after it can be quite hard because it's just uphill.*
Good. Okay. Perfect. I think that is all my questions for you today. If there is anything more, you want to say please feel free but if not thank you for your time.

-----Closing small talk-----

**Johnny (M 30s) 01/06/2020 – video chat**

~~~~~ Introductory small talk~~~~~~

Which park did you say you use between BP and HP?

*I use both quite a lot.*

Ok do you use one more than the other, which one do you think?

*Historically I used HP more, I use them for different reasons.*

Oh, ok what are the main reasons for both?

*I go running in BP and I walk the dog in HP.*

Ok perfect I haven't got a dog walker yet so if we could go down the HP route that would be great.

*Absolutely.*

So, you walk a dog in HP, how many times a week would you say you go to HP with the dog?

*Three.*

Three, okay. And then do you follow the same route or do you mix up the routes.

*Yes. Variants of the same route so pretty much always go clockwise if we - you know Hurst Park quite well?*

Yeah, I was there today with my dog.

*So, if you go in the gate on Hurst Road, on the big road, we don't park in the car park we just go in the gate.*

Is that near the pavilion sport club?

*No, so, you know the big road to Tescos?*

Yeah.

*Basically, there's a gate if you're driving to Tescos from Hampton Court there's a gate on the right-hand side.*

Oh yeah, I know.

*Not the riverside but on the bottom side of the park.*

I'm with you.

*We get to there and we will effectively walk straight down and well do that loop that's sort of the long edge of the park and back down to the gate and we will do three or four loops.*

Ok.

*We don't, you know where the football fields are and the Thames Path? We don't go that far we just walk that inner loop and he runs around. He plays with the silly little blue metal things and all that and sometimes we will cut it short or do a bigger route but generally its 3 loops but we might change it up but relatively it's quite formulaic.*

Ok cool, thank you so don't go near the river just --

*Yeah, we do. So, like on the weekends if we go on a longer walk, we might go to one of the cafes along the river or through the park to Hampton court. But if we are just doing just am morning or an evening 'just give the dog some exercise' then we typically we just go round [the loop].*

Ok so then this leads onto a follow up. Can you mentally or do you divide the park into subregions? So, say you hinted at the football field or you know where the basketball court is. Is that an area?

*Yeah, I think you're right. I think there's sort of, where I just go is the dog walking circuit as such. Like everyone walks their dog on that route. Then you've got the car park. I sort of class it, but I don't know why but we don't go there as much, its more open but then you've got all beyond the playground down to the river and where those football fields are. I don't particularly go there but its less formulaic dog walking and more people sitting around or playing football because there isn't that sort of linked path.*
~~~~~

So, do you think the main reason why it feels different is the path or is it the vegetation or the perceived busyness.

*Yeah, a bit of both. I think the path from a dog walking point of view the path dictates the activity as everyone sticks to the path with the island of long grass in the middle so from a human point of view we are all sheep and just stick to that path. Whereas on the parts there aren't paths and there's not as defined points so like in the bit where I walk the dog their regular intervals where people put their dog shit. There are little things that dogs can do like ramps and those sorts of things. Whereas on the other part of park. I guess if people like throwing balls for their dog maybe not but there's less trees theres less shade it's just more running. Whereas the path you go in and out of the trees there's long grass it's a bit more interesting, I guess.*

So, would you say that's a. I know it's a very vague word but would you say it has a different atmosphere to the other parts?

*Yeah for sure. I know exactly what you mean. Yeah it does. The dog walking bit as I'm now describing it has a very specific atmosphere. Sometimes detrimentally, like I thinks there's probably a feeling is that its slightly owned by the dog walkers because you'll sometimes hear people say why are you cycling here it's dangerous for the dogs. Well, you're allowed to but you know it's sort of now owned by the dog walkers whereas the rest of the park is more… yeah it's just less enclosed, typically less people in the same place because dog walking you run into a lot of people walking the other way or you see the same faces. Whereas if I walked in the other part of the park I wouldn't really expect to bump into anyone its less condensed, people are doing different things, people are probably doing different things people are probably keeping themselves to themselves whereas the dog walk that you do is probably a little more social.*

Ok that's interesting that you say it's more social because there's a thing called a place ballet. I'm not sure if you're familiar with it or not.

*Only to the extent of your write up which I did read.*

Ok so yeah just to recap it's just where routes will converge unintentionally and then you see people regularly or though routing. You might not know these people but they may be other dog walkers or other park users that you'll start to recognise though time which builds a sense of community or togetherness even though you have no idea who this person is really. Would you say this is true for you or if there are instances of this you can relate to?

*Yeah absolutely so it does go beyond that. So, you know it probably goes beyond I don't know if this goes beyond your theory. So your theory sounds like standing up on a train, you'll meet people in the same carriage.*

Yes, that precisely the sort of thing we are looking for.

*So yeah, I get that I wouldn't know these people or what they do [on the train]. In the dog park it does go beyond that because you see these people and it's got to the point now where people are on relatively regular schedules. As you walk round, you'll go oh hello Tom and then you'll then converge your walk. So, we actually know quite a lot of people over there now. And the dogs know each other. Its probably because of the dogs are not as awkward as human so they just play with each other and fight, so you get to know the owner of the dog. Initially it is so and so's owner. So, you don't know their name [but you do know the dog's name] but then you might have a walk with them or a chat about the dogs or whatever. So, I think it starts with familiarity but I do generally get to know the people I do know quite a lot of people over there.*

So, these people you talk of you've met them for the first time in the parks this isn't a pre-existing friendship.

*No, I would never, not ever if I saw them, but I wouldn't ever arrange to go the pub with these people.*

So, you wouldn't expect to see them in the pub as it were

*In this specific part of my life they probably have a similar working patterns so walk their dogs at similar times therefor we run into each other quite a lot.*

Is there any other, outside of dog walking is there any other park users maybe joggers that spring to mind?

*No not really I don't really use HP apart from when I'm with the dog but then if I were to think of like. I know you want to talk about Hurst Park but even like running in BP I follow the same route every time and lots of other people do the same route but tbh like everyone else I've never got familiar with anyone in there or ever really had a social interact in there because like other runners are just generic runners I don't interact with them or whatever. You -obviously see lots of people but I don't recognise anyone and that's probably true for Hurst Park as well, but I don't go into HP without the dog or without needing to.*

That's fair enough. We can talk about BP as well if you'd like? It would be a great help to me to get as many sorts of case studies in either park.

*Yeah sure.*

So, you say you use the same running route as lots of others, is this a route you've created or is this another route like a parkrun route?

*So, I do 2 routes basically if I'm going at lunchtime. So I'm currently in my house I live on xxxxxxx right on the very eastern end of it and basically just under 5k is if I run up along from here along bridge road up past the Italian round the fountain and back is just under 5k and If I run to the other end of it the Teddington end and back is like 8k so I just do either of these depending on how far I want to run or be out the house for.*

So, do you follow Chestnut Avenue?

*No*

Or is it around the perimeter?

*No, it's not the perimeter. So, if you go into from the Hampton court main gate almost immediately I deviate diagonally off left and there's trees and footpaths. Its certainly not the perimeter. So, I'm sort of doing a big oval instead of up and down. There is defined mud track that obviously people have cycled or run on.*

So similar to the question I asked about HP then, could you divide BP into different sections. Like there is obviously the lakes and the big car park and the kids play park?

*Yes massively, so I don't use the other bits as much so when we have gone on big dog walks we have parked in the car park and walked right up that way past Hampton court palace and I'd say there its probably more like. Its more recreational. And I don't tbf coming in Hampton court end I don't know if you can go left. I don't know what happens there I don't really go there. The other part there's much longer grass there's lots of deer around there's lots of people walking dogs' sort of a bit more like a nature walk almost. The bit I run up and down is dominated by cyclists and cars because it's the only place cars can park. There's lots of cyclists and runners there.*

So, its more leisure on the right in your perception?

*Yeah from Hampton Court so if you're looking from the south then the east is a bit more recreational. But in comparison to HP weirdly even though HP is a tenth of the size or whatever, I'd say HP in terms of your question, has more distinct areas. Whereas BP is a lot more natural and homogenous apart from in the actual sports grounds like in Teddington. There are just trees and there is deer everywhere whereas HP feels a lot more like a classic urban area park.*

Ok.

*I'm not being massively clear but hopefully there is some useful stuff in there.*

No, its great thank you. Bringing it back to HP. You mentioned earlier about your dog's playing with the things on the loop, I think they are like the exercise and the fitness things. Theres the ramp and

the climibing thing. So theres many things like the petanuque thing and the playparks. Do you see them as sort of useful to yourself or to anyone you know or community in general?
*I don't know. I don't think I've ever really seen a human use them. You know the like, in the middle of the park there's like that zig-zag thing. So, like we make the dog jump over the bars and the dog likes going to the next one along like that cheese wedge ramp. I don't think we'd really care if they're not there. The dog likes them, but I don't think there used by humans and I don't really think they're designed for dogs. I don't really know what they are tbh.*
Fair enough, so you've made uses which are of benefit to you and your dog.
~~~~~~~~closing small talk~~~~~~~~~~

**Sue (F 40's) 01/06/2020 - telephone**
*Hello*
Hello
*Hi there, can you hear me ok? My reception is pretty crap on this phone.*
Yeah, no no you're coming through perfectly. Can you hear me all good as well?
*Yep I can yes.*
Perfect, ok. Sorry about this whole postponement--
*No problem*
--And mix up in trying to organise a time and date. But I'm glad we've finally gotten round to getting chatting so
*Yeah, no problem at all.*
And thank you for sending over the consent form as well.
*Is that ok in that format? I've got a scanner*
I think a photo will just be fine. That's grand so thank you. Ok perfect.
*It sounds interesting what you're doing.*
Yeah, I'm looking forward to getting cracking in making some visualisations and then really testing them. I thought it would be nice to get some nice real examples of things to visualise instead of coming up with fictional ones.
*Hahah yeah, no problem at all yeah.*
And I'm very grateful that you could potentially provide some examples [for me]. Ok great so we might as well get straight into it then. Out of Bushy Park and Hurst Park do you use both and which one do you use the most?
*I use both but I use Hurst Park more.*
Hurst Park.
Yep.
Ok.
*Yeah, yeah. I use Bushy less frequently now as the dogs have to be on the lead now so yeah Hurst Park is probably my go to one.*
So, would you say your Bushy par use has gone down because of the lockdown?
*Yep yep.*
~~~~~~~~

Ok so If we just focus on Hurst Park then for the majority of the interview then that would be great. So, is that to walk your dogs?
*Yep.*
How many times a week do you go there?
*I'm at Hurst Park 4 or 5 times a week.*
And then, perfect, sorry so do you follow a common route, or do you have a couple of common routes or when you go there do you just go anywhere?
*So, I have a couple of routes. So usually if I do a morning one I usually park in Ferry Road.*
Ok.
*And then I walk up to the marker round the marker and back again.*
The marker?
*That's on Hurst Park.*
Sorry what marker do you mean?
*So, its like this circle with a row of seats where they've put a sundial.*
Ah yeah yeah yeah sorry I know it.
*I don't know what its real name is.*
It's got all the facts about all the different sports and things that have…
*Yeah.*
Yeah.
*Yeah.*
Ok.
*So, I do that usually in the morning and sometimes in the evening. But in the evening now I tend to go to the Hurst Meadows as there is less people.*
Ok.
*I used to go to both evenly, but I tend to go to Hurst Meadows more now yep. And for that I park in Saddlers ride and walk in that way.*
Ok so it's interesting that you say that you perceive Hurst Meadows as to be quieter. Would you say that it has a different atmosphere to it?
*Yeah, its quieter at the moment because of the people because of the number of people out on Hurst Park having picnics.*
Yeah.
*At the moment and with dogs and sort of things its carnage over there. So, the meadows I find – I'm not sure so I know its split. So, you've got Hurst Park and then you've got the meadows so I tend to walk round. You know the basketball court?*
Yes.
*So, I don't do that bit I do the meadows the actual meadow bit.*
Uh hum.
*Yeah does that make sense?*
Yep.
*So, I'm that bit and it is quieter, not so many people in that section. Not sitting down and having picnics and things.*
Would you say that maybe you are more relaxed walking there with your dog? If, I don't know if your dog might run over to people picnicking or ---
*Yeah so um it is more relaxing because at the moment um with people sitting down having picnics and things like that my dogs prone to going up and sniffing and wanting food and things like that.*
Ok
*So, it's not so much of a relaxing walk [up there] at the moment. So that's why I go to the meadows yeah*

Ok yeah so, I don't want to put words in your mouth but Hurst Meadows is overall more of a relaxing environment.

*Yeah yeah there is less people in that section.*

Ok. In your mid could you divide up the park in any other way as well? So we've got the meadows and the park is there any other sort of, not necessarily physically but sort of, again all these terms of sense of place and atmosphere is there any way you could slice up the park even more?

*Oooo erm so I would say like, playing, you've got the basketball area which is a bit sportier. You've got the other erm, I can't remember the name, that french game [petanque].*

By the car park?

*Yeah. So that area is sportier, more family orientated the actual meadows is more dog walkery.*

Okay.

*And then the bit that I walk up in Hurst Park. Its changed, I mean the atmosphere have changed because obviously with what's going on. It was a bit different before all of this was going on. It was a bit quieter.*

Ok that's perfect, yeah. Ok and then there's this whole other human geography phenomena called a place ballet. I put a couple of lines in the document but essentially it's just the convergence of unintentional routines so in a park maybe if you go there frequently, someone else goes there frequently. You don't know them; you don't know their name necessarily but you kind of feel like you're getting to know them…

*Yeah so that's exactly… so depending on the time of day I go, doing the Hurst Park in the morning and things. So, at certain times in the morning you're going to meet people, dog walkers that you speak to you chat to. You don't necessarily know their names, but you see them on a frequent basis.*

Ok so how sort of certain would you be, in a percentage way would you be that you would see them if that made sense?

*So, If I go there between 7.30 and 8,30 in the morning I'll be 80% sure I'll see quite a few of the regulars. I recognise quite a lot of the people out there in the morning and their dogs yeah.*

OK so do you feel like that gives you a sort of community?

*Yeah it is, it's nice.*

A friendliness to the park?

*Yeah yeah.*

How would you feel if say you went there yesterday, tomorrow sorry, and all the people you were potentially expecting to see, you didn't see any of them? Would you feel concerned or weary?

*No not really. Sometimes it's nice to chat to people sometimes it's not. I do look out for certain people, certain dogs and things. I mean if I haven't seen them for a while, I might get concerned but not if I'm just going to tomorrow and don't see them no.*

Ok so it wouldn't be an apparent realisation that someone's missing?

*No no not just one morning walk but maybe over the course of a few walks, just one morning walk no.*

Thank you ok perfect. That's everything for Hurst Park is it ok if we talk about Bushy Park a little as well?

*Yep Bushy is fine.*

Ok I know you use it less now but --

*Yeah, I tend to use I probably use because there is Home Park and Bushy Park I'm probably now using home park more. I do use Bushy Park I usually go at the weekend.*

Right ok so would you say you do that once a week or twice?

*Yeah maybe once I week ill maybe go to home park or Bushy Park yeah.*

And this is for a dog walk as well or?
*Yeah for a dog walk. A long one as it's the weekend. Something different for the weekend yeah.*
Ok so similar to the Hurst Park question could you divide or is there any distinctive zones or divides in Bushy Park?
*Yeah, I tend to either tend to do depending on how many people there are around. I don't know if you know about the car park by the Diana fountain.*
Yeah yeah yeah, I'm familiar.
*Yeah so, I sometimes so I park there and there's that section I go into or I go into the car park that's only open on the weekend that almost on your left hand side going out. Its only open on the weekend near you know where the café is the Pheasantry [café]?*
Yes.
*There's kind of like another car park that's only open on the weekends.*
Is that the one with the cattle grid or?
*No that's going into the Pheasantry [café] but if you're going round to the left of the café there's another one if you go straight down there, almost if you go near the cricket grounds.*
Ah yeah yeah yeah, I'm with you I'm with you
*Yeah yeah, I probably park in that one more as its less busy. There the two that I would divide the park into yeah yeah.*
So, to tie it back to this sort of atmosphere thing would you say that the one that's less busy would be the one that again more relaxing or?
*Yeah for me it's more relaxing yeah yeah.*
Ok and would your walk stay away from crowded areas, so like by the Diana fountain there's like the kids play park and an ice cream van.
*Yeah, you've also got the runners its busier a lot busier over there. I tend to do more of a quieter walk from the other car park yeah.*
So, you'd feel more at ease?
*Yeah there's slightly less deer over there. And its slightly longer over there, I can make it longer my route. My routes a bit longer for it that one.*
Ok so deer is also a concern for you when you're with your dog I guess?
*Yeah so 3 dogs 3 dogs. 2 out of the 3 yeah. One of the three is completely fine the other two I have to watch a bit more yeah. And that's why I probably go to home park more. There is less deer over there so I can see them from a greater distance yep.*
And then again so is there a common route that you have. You said that there is a longer route that you have in the second carpark.
*Yeah so, I do tend to follow a longer route I come round past the cricket club round, kind of like the perimeter of the park. Around and then sort of like - yeah there's. Just trying to think there's like a little fountain that they dug up in a little garden.*
Is that near Hampton?
*Yeah, I follow the perimeter round so I'll do it that way yeah and back round to the car yeah so, it's a bigger walk yeah.*
And this might sound like a really vague question, but it would be really good to get a sort of emotional spectrum. Is there particular points along that walk where you may be more relaxed knowing that there won't be any deer or there's less people or is there parts where you have to focus more like a road with dogs, anything. Any potential reason.
*Yeah so, I'm actually looking at the map so I can explain a bit better*

That's ok

*So, I do the path to the left of the Diana fountain there id defiantly an area that I just find quite busy. Going back to the bit where I park in the middle I find that whole walk a bit more relaxing but the section, it runs the bit I'm looking that I find quite relaxing is a footbridge called brick bridge and there's like a river that runs along and the dogs can go in and out of that and apart from dog walkers there not much going on along there.*

Is that near the boating pool, are we looking at the right section

*It's near the Woodland Garden. So, all round the Woodland Gardens there's a nice little stream round there and the bridge and the dogs can go in and out of the stream. That bit is really nice and relaxing. I quite like that section.*

And are there any sections along there that could be a negative section?

*Urrm I suppose the bit, on that section, if I'm going round past the sports ground and the cricket ground it's a little bit busy along there and things, there's quite a few deer and things like that and so that section round the back there is less relaxing but generally that section of the park round there I find much more relaxing and it's just like you know I don't have to concentrate too much on things because they're [the dogs] fine.*

Doing their thing?

*Yeah whereas the other section where I park in the Diana fountain the path that runs all the way along sandy lane towards Hampton wick gate sandy lane gate along there um its quite good because it's a long path but you've got the cyclist and you've got the runners and you've got people going in and out of the gates so there's a bit more it's not as relaxing on that section. But I would definitely say the bit around the woodland gardens and the bit with the river is def the nicest part of the walk.*

Ok because I believe that in the actual gardens of the woodland gardens itself if I'm not mistaken –

*I don't think I've ever been in the woodland gardens because you're not allowed to take dogs.*

So yeah I was going to say if you were going to make a map of say your, not perceptions but use of the park, what's useful to you in the park would the whole woodland gardens itself kind of be blank or not be on the map?

*Yeah because I'm always there with dogs I never go in. I mean id quite like to go in if I could keep them on the lead and go in that would be nice but I cant yeah so that's not really yeah.*

Ok so your park experiences are very sort of dog influenced

*Yeah its all dog I only go there because of the dogs yeah. Occasionally I go there when they have a parade there [chestnut Sunday] but otherwise its just dogs.*

Dogs.

*Yeah.*

Ok perfect, I think, I think that ticks off all of the questions I really had and covers everything that I wanted to kind of chat with you about.

*Oh wait there's another section I'm just looking at.*

Ok.

*Heron Pond. So you know when you park by the Diana fountain there's that pond Heron Pond*?

Yeah.

*That section I always find not relaxing because you've got ducks you've got deer you've got people you've got fishermen all that section there. That where I don't find it very relaxing and I tend to have the dogs on the lead during those sections.*

Is that just Heron Pond or is that including the extension of Leg of Mutton?

*Yeah Leg of Mutton as well that section there Heron and Leg of Mutton that section there. The dogs are fine but it's just lots going on and the dogs like to go in and out of the water so yeah I always keep them on the lead in that section.*

Ok so there thank you from what I'm gathering you very much prefer the western side of the park.

*Yes, I do yeah.*

Do you think there is kind of a physical barrier Chestnut Avenue as a road do you see the park as two bits?

*Yes, I'd say its half and I tend to do walk around that section where the Pheasantry [café] is on the left that's probably my preferred section.*

Ok and then you would never cross Chestnut Avenue mid walk.

*I have done before yes I have done I don't do so much now as one of my dogs is quite old and he cant quite do the whole walk but ill happily do the whole walk Ill do the whole walk so ill cross chestnut go up to heron pond and back round yeah.*

So the road isn't as much as a mental barrier in the park?

*No no.*

Ok well thank you very much for your time unless there is anything else?

*I think that everything, thank you. If there is anything you think oh shit I should have asked let me know that's fine.*

~~~~~~~closing small talk~~~~~~~

**Martin (M 40's) 02/06/2020 – telephone**

~~~~~Intro small talk~~~~~

So to start I'm focusing on Hurst Park and Bushy Park, which park do you use the most?

*Bushy Park.*

Bushy Park?

*Yep.*

Ok so we can focus on BP as the case study, I'm trying to get a good spread of people for both. What would your main use be for BP?

*I work there.*

Ok what work do you do?

*So I'm a freelance personal trainer.*

Ok.

*And I am in Bushy Park for work reasons about 5 times a week. Mon – Fri usually.*

Ok 5 times a week. Ok so there is a part of the thesis that focuses on routes through the park. So where abouts do you do your personal training with your clients?

*Ok so I usually meet in the Diana fountain car park and work immediately in that area and there are 3 main routes I would take if I was with running clients.*

Ok so you have running routes as well?

*Yep yeah I have 2 or 3 that I use. So one route is about 5k. It would take you up to the toilet block. I don't know how well you know BP.*

Yeah no I'm familiar. I can always pull up a map as well if need be.

*Ok so I would typically go from the Diana fountain car park up to the children play park and turn left following that perimeter path all the way round to Teddington gate and then head back up chestnut avenue to the car park. And that's about 5 kilometres.*

So the perimeter of the whole eastern section pretty much?

*Yes yes. A shorter route I do as well is the same start up to the toilet blocks but I would turn left earlier and then down Cobblers Walk. You come out of chestnut avenue again, turn left and that's the shorter route.*

Ok.

*Going on the other one I would usually go [to the] children's play area turn right head towards white lodge crossing over the road at the trees and turn right. The tarmac path goes over a small stone bridge. Between the two gardens and then following the path round the back of the woodland gardens to bring back round to chestnut avenue again and back towards the carpark.*

Ok.

*Does that make sense?*

Yeah yeah I'm with you so that's now on the western side of the park

*Yes I cross over as still go along chestnut avenue. That's probably, I do other variations of that but that's my longer route. Go up to the children's play area, turn right go round there, round the back of the Pheasantry [café] or the woodland garden and the other route, Teddington gate, all the way around along area to come back to the children's play area. So there's sort of a combination of two routes one way and one long one that encompasses both areas. Does that make sense?*

Yes yes no its perfect and its good to see that you cover quite a bit of the park. So some of the thesis is focusing on. Looks at these routes its looking at visualising the sense of place or the emotion, atmosphere. Like how you feel as you travel along a route. Do you have either a favourite thing or area of the park that you pass through or a particular route that you enjoy personally, I don't know, for whatever reason and conversely is there a part of the route or a part of the park that you are more cautious or you enjoy less than the rest? Does that make sense?

*That makes perfect sense now please understand I'm going to be very honest about this so please understand that I'm not kind of pissing on anyone or any one group of people but there are bits of the park along those routes that I don't particularly enjoy and I am very careful around.*

Ok.

*And sort of taking the first route, the stretch from the toilet block towards Kingston gate, going round there tends to have a lot of cyclists, usually commuters on it and its very dusty so I don't particularly enjoy that bit. It gets a lot nicer once you get past there. If you go all the way to Teddington gate and then back in again its very nice going down chestnut avenue. Its nice wide grass its relatively flat, there is plenty of space for people.*

Especially now without the cars at the moment

*Well yes although I must be honest I'm not actually working there the last couple of weeks. But that's beyond the situation innit. So that gravel track up towards Kingston is a little bit unpleasant, as is cobblers walk which is the tarmac path that runs through the centre of the park. I take that route, that also has a lot of cyclists on, they go quiet quick there and that path is relatively narrow, its probably no more than 5 or 6 feet wide. So if you get 2 or 3 cyclists coming up at different directions it's a bit of a squeeze. But going around the other way, I don't like dogs a great deal, so there's an area between the two woodland gardens so if you, and its just over that brick bridge on my route round going the other way. And as I go between those two gardens because no dogs are allowed into the gardens it's a "choke point". There is a convergence of*

*about 1,2,3 5 paths coming to that point and if you're walking a dog from the Hampton side to the Hampton court side that's the route you're going to take by and large. That's an uncomfortable bit because I'm not a huge fan of dogs. So I'm just really cautious around there.*

Thank you, yeah that's totally valid.

*In terms of my favourite part of the park out of all of it, down by Teddington gate there's a field and it's an open place, it's about the size of a football pitch and its quite close mown its just a big area of grass. I think it's from WW2 where they had a number of camps there, there's a flagpole just of to the side.*

Ah yes I know.

*And, as an area of the park, its my favourite bit out of all of it. Its flat, its open its usually quite quiet. Sometimes there's some kids kicking a football around, that's cool. But it's a tiny tranquil part of the park. About 15 years, I've been working in the park, yeah that corner.*

Ok thank you. That's perfect so we've got a good, some positives, some negative areas of the park which is always useful and fun to hopefully explore.

*Yeah I've been pretty negative about some of it but –*

That's alight.

*Chestnut Avenue, I like the history of the park as well so that particular corner with the view is fantastic.*

Are there any sort of the water, like the ponds do they have any sort of positive or negative affects. Maybe its fishermen or the relaxation of water does that have any influence on you would you say?

*Yes, I would. I think its called leg of mutton pond and the 2 lakes are connected next to the Diana |Fountain carpark and you can walk a lovely loop, sometimes Ill walk around there, sometimes when I have no clients, ill walk around there. Particularly round the back side of that, the northern area of that bit I guess it would be its just a really nice sort of quiet area just to walk around. Diana fountain, looks amazing, its great but it is just a big circular pond in the middle of a roundabout so. It looks great and I know the history of the water features are interesting as well. In terms of, you know the water park. I cant remember what its called. The Water Gardens?*

Is this the one near the Pheasantry [café]?

*Its over towards the Hampton side, it recently got refurbished. Oh what's it called?*

[The] Water Gardens, I think

*Is it just The Water Gardens?*

Yeah, I think you got it right.

*It used to have a grotto just behind it.*

Okay.

*It's full of water. That's an amazing part of the park. I can't actually remember what it's called but it might just be called the water gardens. Yeah its over there. That's a lovely part of the park.*

Ok perfect, thank you. So away from routes and atmosphere there's another feature called a place ballet which is were. A non park example of a PB would be say… well it's the unintentional convergence of routines which then give a sense of familiarity with the person. So a non park example would be so if you caught the same commuter train every morning as someone else but you didn't know who they were but you knew that at 7.30 they would get on at Thames Ditton [a local train station] up to [London] Waterloo or something. And so there is a kind of sense of familiarity or community with either that person or a group of people. So I'm trying to find any potential PBs that happen in BP or HP so for you could you experience anything like this in BP or that you do experience anything like this?

*Yes I do experience this. Because I'm there at quite regular times, in the mornings for example, I tend to see the same people.*
Okay.
We acknowledge each other, a nod or a smile and it invariably happens that if I'm with someone they'll say oh do you know that person? No, just see them here every Thursday or whenever. There's 2 or 3 people like that [famous model] lives in Teddington. If you've hear of them before?
Sorry could you say that again please.
*Yeah there's a model called [omitted].*
I don't know them but.
*She's a local celebrity but I always see her always exchange a smile. There's also a woman who walks her dog. It's a little black terrier and I see her 3 times a week. Always around 9.30, I always get a nod. Its almost becoming a bit of a, not a joke but its like "oh hi" "hi" and I think if she wasn't there I would notice.*
Oh ok that was going to be my follow up question if you didn't see these people or say this dog walker would it be apartment, or would obvious that they're missing rather than just not there?
*Yes, in her [the dog walker's] case yes you'd have a moment and think 'oh did she go on holiday' you'd kind of wonder why [she was not there]. With some of the other runners there is another runner I see she is obviously a county level runner you can tell that with her training jersey and I always see her at a certain time running a certain route. If she didn't do what I expected her to do I would think that was out of place is another one. But with this dog walker i she wasn't there you know you'd think what's going on there. If it then happened over a couple of weeks you'd then really start to wonder what's going on.*
Ok that's really interesting. Where abouts in the park would you say you normally bump into her?
*Always on the stretch between, you know the bit between the two woodland gardens and the crossing point.*
Is that the bottleneck of the dog walkers?
*Yeah.*
Ok.
*It's a little bit further on but yeah, just there going around the tarmac path all the way round to the car park entrance of the Pheasantry [café].*
Ok.
*Its always that stretch.*
Ok perfect, its been quite har to find some in BP but it sounds like you've got quite a strong one there, that's reassuring.
*Yeah its purely due to the nature of the way the park is organised there's only one or two ways from one side of the park to the other side of the park. And that is either the road that runs from Hampton through to chestnut avenue passed the disabled car park. Or its that crossing point by the bridge because it s the only way of getting from Hampton to the other side. Without doing that you don't have access to the other half of the park. Its pretty good for that I would have thought from the point of view of what you're looking for I would have thought.*
But yeah no perfect, thank you and then one final sort of quick quickish question is, you've kind of already eluded to it as well but its also trying to divide the park into subregions maybe based on atmosphere, well based on anything, you've kind of hinted at the access at this point and either side of it as a different region as it were, do you agree with that but also can you think of any other ways of dividing the park in atmosphere or in any way that you can think.
*So the Diana fountain side you have that very sort of formal layout, a series of avenues and lines of sight and it feels very sort of formal and laid out and it has that sort of feeling of a designed area much like over the road at Hampton court*

*palace where you've got the avenues it feels like its in that spirit. As soon as you go up towards the left, towards Kingston gate, you get that slightly more rugged bracken feel which always puts me in mind of kind of grouse bracken and that's where the skylarks are. It reminds me of sort of places on the South Coast [of England] and places I've been down there. And then as you were to go the other way onto the Hampton side you get sort of mounds within the grassland. Quite long grassland, you get these mounds, sort of tufts, they're colonies of yellow ants each one is a colony and it always reminds me of the grassland in Wales a particular place where I was in the military. We actually have a name for them in the military 'Babies heads' these sorts of mounds and tufts of grass that poke out. SO you get this kind of variability where on the one side its very formal, laid out the other it looks like you know, grassland in wales and the other it looks like the south coast bracken. Does that sort of help?*

Yeah no that's perfect, I fully understand. And yeah that's a very interesting way of perceiving it.

*It just puts me in that mind as I go round really. One area is wild and you expect to be windswept and could be blown away at any time and the other is running is another wild landscape.*

Would you say these two regions when you're in the help trigger or recall memories of when you experienced these other locations when you were on the south coast or in Wales?

*Yes very much so, particularly when you go round Kingston gate it reminds me of some areas around Poole Harbour, very happy childhood memories particularly.*

Ok.

*Whereas on the other side I always joke about that the army would be very well qualified to come here because it looks like most of the areas we spent most of our time training. I think both are particularly happy memories just for different reasons really.*

Oh ok that very interesting cool I think that's all of my questions I have for you unless there's anything else you feel you want to share?

*Not necessarily, I know HP as well but I don't want to confuse it by going over some of the areas there.*

That's ok.

*That's particularly heavily used at the moment so I haven't actually been there that much recently.*

It is very busy, I take my dog there and its loads of picnics.

*Yeah its mad at the moment. Bushy Park for me, the one thing that makes it really unique place to work is because of the lack of sort of housing around it in certain areas and because there's no road that runs round it, its actually very easy to find spaces that are very quiet. That's in marked contrast to say Richmond park which has a perimeter road and you sort of step out from the car park to the area so Richmond park is really densely packed but bushy park has that sort of you've got to go in a bit to get a quiet corner of the par that's hard to get to. For that reason I quite enjoy it as a quiet oasis of calm around you it's a lovely place to work it really is.*

Would it be fair to say you prefer BP to RP?

*Ah what you've done here is you've lead me into the most common argument I get into in that everyone asks me which one I prefer. And all my clients say like oh what about Richmond park, no Bushy park BP is my favourite. I still remember my first trip there it was boxing day 1997 I went out for a run I started on one of the routes, never looked at the map again. Started on one of the routes at the children's play area. And I thought I knew this I've driven through it at least once so I set off for the run to the Kingston gate, all the way to the Teddington gate and I thought oh that's only taken my 25 minutes or so instead of going up the road ill explore the other side of the BP. I got so badly lost, I didn't know which way I was going. I literally kept the exterior wall of the park on my right shoulder and I followed it round every nook and cranny of that park until I eventually got back to chestnut avenue where I knew where I was then. What was supposed to*

*be a 40 minute run took me 2.5 hours. I was exhausted, absolutely knackerd, I'd completely burnt myself out. Happy memories of bushy park. I still remember my first visit. On my hands and knees on my way back.*
Ok perfect ok yeah so thank you again for your time this morning, I'm very grateful.
*Yeah no problem at all.*

~~~closing small talk~~~

**Louise (F 30's) 04/06/2020 – video chat**

~~~~~Introductory small talk~~~~~~

*I use both (parks). I live in East Molesey.*
Which one would you say you used the most then?
*Bushy probably.*
Bushy ok. What's your predominant use of BP?
*Walking with my child.*
Ok and then how many days a week would you say you do this?
*Well the thing is during lockdown, 5 (laughs), not during lockdown, 3. So that's still quite a regular use then.*
Yeah very regular. So part of the study focuses on following emotions along a route –
*So... sorry I bicycle and I walk.*
Ok.
*I don't know if that makes a difference. When I go with my husband we cycle round it but again only during the lockdown because of the cars normally.*
I know, I love it with no cars.
*Yeah. But normally I guess I walk.*
Even with your cycle rides would you say you follow a similar route? Or would you kind of go wherever you fancy?
*Oh you mean each time?*
Yeah.
*So say I'm walking I've got two routes. I used to use the park for something else as well. Ill just follow the questions that you're saying. Sorry yeah.*

That's ok
*Shall I be doing it as the past few months because I've been doing it differently since lockdown?*
Shall we stick with lockdown as it will be fresher in the mind?
*Yeah that sounds easier.*
Ok so with your cycling and walks part of the study id looking at routes and displaying emotion and how it can change in a route.
*Right.*
So would you say you have one or a couple of routes that you use or do you just go anywhere depending on how you feel?
*No, we've got a couple of routes.*
Do you mind sharing one of them? Your most common or your favourite?
*Oh actually the one I've been doing the most recently is the entrance on Hampton Court Way.*
Ok.
*That one. Is that what its called?*
Is it the main one with the road?
*You know, the roundabout opposite Hampton Court and you go left down that road?*
So along the river?
*Yeah yeah parallel to the river. And there's a little entrance there.*
Is that just beyond the car park?
*Yeah that's the one. I go in there and then basically I walk into the woodland bit and then do a circuit in the Woodland Gardens and come back. That's one route.*
That's really interesting then because I've not had anyone yet that's gone into the Woodland Gardens.
*Oh well I've only just discovered it a few weeks ago but I keep going back.*
It must be good then.
*Its amazing yeah.*
I'm trying to find high and low points of the route as it were. Would you say that the Woodland Gardens itself is the best bit of the journey?
*Yes 100%.*
And is there anywhere on the route that you dislike or like less?
*Yes so because I'm with a 2 year old I don't like a crossroads. So basically there's a place where cyclists go very fast across before you get to the woodlands. So that crossing there is not nice.*
Is that the bridge?
*No no its not a bridge its just path but there's loads of cyclists bombing along it. It's a crossroads.*
That's interesting because I think I know where you're talking of and someone I chatted to yesterday had a very similar –
*You basically go straight from the entrance parallel to the river and then that's where it is.*
Yes perfect I think I know where it is.
*And if you look right there are loads of trees that end up at the Diana Fountain.*
Ah ha ah yeah.
*And then you go straight along and you're in the Woodland Gardens.*
Another thing in the thesis is talking about regions and subregions in the park.
*Sorry say that again.*

So some of the thesis is focusing on subregions and the atmosphere and the ambiance of different parts so would you say that the woodland gardens is very different to the rest of BP? And could you divide BP up separately in other ways?

~~~~~~ lost phone contact~~~~~~~

*Hi, sorry it cut out.*

Hiya, no worries.

~~~ small talk again~~~

So some of the thesis is focusing on regions and subregions of BP so would you consider the Woodland Gardens separate to the rest of BP? Not just physically but also atmospherically?

*Definitely. Deer aren't allowed in and nor are dogs so it's a nice space to go with a young child. You can sit down and have a picnic or do what you want to do and it feels safe. A lot safer.*

How would you describe the atmosphere to extend on safer? Would there be any other words or terms you would describe.

*Quite, no bikes, no cars and more contained id say. There's loads of ponds everywhere but it feels safer. No deer. No dogs.*

So less worries or concerns to be wary of?

*Yeah when you have a small child.*

Would you say, I don't know – I don't think I've every been in the woodland gardens but because its seemingly quite a popular section of the park that it gets quite busy or crowded in peak times or is it generally quite nice and still relaxing?

*I haven't been there during the weekend, I've only been there in the week so I don't know. I don't know. I've never seen it busy.*

But generally it's been alright for you I guess?

*Yeah.*

And then outside of the woodland gardens do you think you could divide BP up? Are there any other sort of areas you'd consider separate?

*Ah so when I cycle I cycle the perimeter.*

Ok.

*I cycle the whole way round.*

Do you think it changes in atmosphere along the way?

*Ah yeah, id say so. I've got other favourite spots. It depends because there's lots of open bits and then lots of sort of treey wooded bits with more trees.*

Yeah.

*So my other favourite bit is you know the gate that goes in at Hampton or Teddington I think it is--*

Is the road one or just a path?

*The one that goes straight down to the Diana Fountain [Teddington].*

Ok yeah.

*Next to that if you're looking towards the Diana Fountain there are lots of trees and its a lovely walkway down there. Its quite sheltered and I prefer those areas to the ones where there is a lot of open space and high grass and deer. And I guess there are some places that are quite bumpy and hill and this bit it long grass.*

Are there definitely places you avoid because of the vegetation?

*Yeah I'd say the vast open spaces I wouldn't go to.*

Ok perfect thank you. The final part of the thesis focuses on a feature called a Place Ballet. Which is a kind of unintentional convergence of routes and routines which then give a sense of community and familiarity over time.

*Ok.*
So a non park example might be if you got the train to work everyday and you would recognise someone that would always get on at Surbiton or something and they get off at Wimbledon and it would be the same train as you every day and you kind of feel like you know the person but you don't. If that makes sense?
*Yeah.*
So I'm asking everyone that I'm talking to if you feel that happens to you in any capacity in BP?
*Aaaaaaa yeah I guess so. As well as going to the Woodland Gardens I also go through the HAMPTON Court gate. From there there's a real familiarity*
Do you see anybody you don't know but you see them a lot?
*What people?*
Or dogs, anyone?
*Sometimes I bump into a couple of friends on my walk.*
But nobody you don't really know?
*No not so much, that happens much more in a park closer to me.*
Ok no worries.
*That happens a lot more but Bushy Park no. Because its so big no. It happens in Hurst Park, it happens in the wilderness but it doesn't happen for me in BP.*
That's ok the only people that have been saying yes have been doing the same route for years and years.

~~~~~~closing small talk~~~~~~~~

**June (F 50's) 04/06/2020 – telephone**

~~~~opening small talk~~~~~

So which park out of the two Hurst and Bushy would you say you use the most?
*Bushy probably but I do go through and past Hurst Park quite often.*
So how often would you say you use Bushy a week?
*Well its increased an enormous amount in the last 2 or 3 months I've been going there probably 2 or 3 times a week.*
What is your main use of the park?
*Leisure end exercise.*
Do you jog or cycle?
*Cycle mainly.*
Ok so some of the study focuses on emotion and routes and atmosphere along a route. So when you cycle do you have common routes or one route that you use?
*As we are in special times, I've made a point in using different routes.*
Ok so you have had a good explore of the whole park?
*Yeah, I've gotten really into it.*
In which case that's perfect for the regions and the sub-regions of the park.
*Okay.*
Another thing is looking at if you can divide the park in terms of atmosphere or sort of sense of place which is a very sort of abstract way or saying atmosphere. Would you be able to, or can you divide BP into different regions?

*Oh yes.*

So for example what would your favourite area or region be?

*That depends on what I'm looking for on a particular day but there are. I suppose one obvious area is the woodland gardens which has a completely different atmosphere to the rest of the park.*

How so would you say?

*No dogs, no bikes, kind of peaceful, people don't go there to exercise so much. There's plants and waterways and there's families sort of having picnics and things. No dogs. So that's the sort of woodland gardens. I've been blown away by the beauty of them. But other than that I want mock countryside so the area outside particularly. Sorry should I just ramble on like this*?

Yes, that's great, please.

*The area that I think of as the Kingston end and the Hampton end in 2 halves divided by chestnut avenue often I meander around the Hampton half which has a real feel of countryside about it. As does the other half but differently.*

How would you say they differ in the mock countryside as you say is it to do with the lakes or the ponds in the Hampton side?

*Yeah whatever looks the most naturalistic, obviously it's a park but the mature trees the Kingston side seems a lots more open. There's a part where they're trying to protect the skylarks and that's quite open and there isn't many trees in that bit. I'm not so bothered about the lakes and the car park and the children's playpark that's more for younger families I would say. I meander around where it just looks fairly empty and where it looks nice.*

So you mentioned the car park and the kids play area how would you describe the atmosphere there then. More outside of lockdown then now.

*Yeah well busy I would say. My children are grown up so we used to do all the things young families did there, the playground stuff, but that's not what I want to do right now. That not my natural habitat now without little children now. So I don't really hang around there much. Also when the carpark is absolutely packed its very off putting and it takes ages to get out.*

Yes it does, I'm absolutely loving the no cars at the moment.

*Ah its amazing.*

Running up and cycling along chestnut avenue is lovely

*And going the wrong way around the lake just because you can (laughs).*

So you talked about the Kingston end and the Hampton end as well would you say that chestnut avenue is the divide?

*I guess it is but you've got the Teddington end as well its like thirds. Kingston Hampton and Teddington. The top half, the north half would be Teddington. Which overlaps with Kingston and Hampton halves.*

So would it be fair to say that Chestnut Avenue bisects the park and then the Teddington end overlaps on both halves?

*That's how I see it yeah.*

Which area is your personal favourite out of the three?

*It depends on my mood. Probably not Teddington first, that tends to be quite busy. If I absolutely had to come out with one I would go for Hampton the part but close is the Kingston end.*

So they're both good?

*Yeah its like when my daughter always used to ask "what's your favourite food mum?" and it depends what I want at the time.*

Haha it was a tough question. OK, the other part of the thesis looks at this thing called a place ballet which is were people have different routines and they unintentionally come together and then that

gives you the sense of familiarity with the person or if its with a group of people a community feel. So a non-park example might be if you got the train into London every morning. Someone else who you don't know but you might recognise them because they get on the same carriage at Thames Ditton and they're always get off at New Malden or something I don't know but you feel like you know the person now because you see them every day.

I *see*.

So I'm trying to find if someone experiences this in the parks, would you say you experience this in BP? It could be a human, it could be a dog, anything.

*Well not so much in BP, sometimes you see people you vaguely recognise walking their dogs and things from the area but I wouldn't say I tend to see people at the same spot or route. As I say I've been going to different parts of the park and then quite often I go to Home Park or down [up] the river so I wouldn't go to Bushy for a couple of days. And I'm not a dog walker so I don't go out at the same time every day.*

It does seem to be that mainly dog walkers and those with very rigid routines that have found these. Cool ok. I think ah yes sorry. So you say you use the Woodland Gardens are there any sort of other, obviously lockdown has probably, well most certainly influenced this but are there any, this is going to sound very general but are there any things in BP that you use. For example, the car park, the ice cream van, or the Pheasantry café.

*I do go to the Pheasantry café I don't really like it that much but it's a convenient place to meet friends from other areas. What else might I [use]?*

Again it could be as innocuous as a park bench.

*Yeah I know what you mean. I like the, there's a couple of rather lovely houses in the park. One on the Kingston side and one on the Hampton side. Upper Lodge is one and I cant remember the name of the other one and sometimes I cycle past and have a gawp at them and think what it would be like to live there. There certainly interesting features. I like the passageway from Hampton Wick into the park its got a name and its down a lovely avenue of trees.*

Is that near the Kingston uni tower block thing?

*Yea right opposite there.*

Ah yes I've got.

*It's a rather nice avenue.*

~~~~~closing small talk~~~~~

**Jackie (F 30's) 04/06/2020 – telephone**

~~~~~opening small talk~~~~~

Which park do you use the most out of HP and BP?

*Hurst because I run. I run round.*

How many times was that?

*3 times a week, I always hit the river. That's what you mean by HP yeah the riverside?*
Yeah the Thames Path along the river is perfect. Is your running route along the Thames Path?
*It is yeah. I loop from home and about 50% of it is down the river.*
Ok so you don't go onto any of the grass as it were?
*At the moment I do when people are trying to distance from me but normally the path.*
Ok that's perfect because I haven't actually got someone that uses the Thames Path so perfect. So some of the thesis is about your emotion or perceived atmosphere as you go along a route so you seem to have quite a clear route of going along the river. Do you have a favourite part along the river that is within the park boundaries?
*Yeah probably like the locks nice, like the lock at Hampton Court and then the open space like after the cricket club there's like an open space isn't there, yeah that bit there is probably y favourite because its open its nice.*
Conversely do you have a part of the route you enjoy the least or is less enjoyable then the others?
*After the cricket club you get to a part where you put the boats in.*
Is that near the car park?
*Yeah the car park leads to it. As you go past there it splits into two. On one path straight ahead and there's anther path but the roots and the trees and everything its mental. Just for that short period its not the best.*
Ok so do you have to be more cautious that you don't trip or you slow down?
*Yeah, watch your feet a bit you know?*
Okay
~~~~~starts talking about parts of the route that are not in the park~~~~~
Ok so there's this thing called a place ballet. What it is the unintentional convergence of routes. So an example not including parks would be if you got the same train to London every day, you might recognise say someone that gets on at Surbiton on the same train as you every single day. So you don't know this person but you kind of feel more familiar with them. You'd expect to see them even though you don't know them. Would you say on your runs you go past anyone or go past anything that's happening that has become regular and you expect to see?
*Yeah I used to [pre lockdown] run before work like 8 o'clock or something id always see the same dogs and there's a couple of guys that swim in the river.*
Ok.
*I see them on the run and there's a Chinese couple that walk, I bump into them. So yeah id definitely say there is people you recognise.*
So that's very interesting. Do you know where on the route you would typically meet the swimmers?
*The swimmers, by the tree. You know the Tescos?*
Yes
*Ok so by there, past the marker for the corner of Tescos*
Is that where there's is a gravel path.
*Yeah, there's like a overhanging tree and that's where they go in.*
Ok.
*And the Chinese couple that are walking I tend to see them at the Hampton court end. I always see a Labrador with its owner along the route but that could be anywhere along from where the boats go in and onwards really I see them.*
Ok.
*There's a guy with a couple of jack Russell who is always on the grassy bit near Tescos.*
Ok so this is all very interesting. So it seems you've got quite a lot of people you recognise.
*And Tony the Tramp. [local figure]*
~~~~~

Ah yes he's on the bench

*Normally he is but he's not there at the moment.*

That's very true, hopefully he's ok.

*Yeah.*

So would you say when you go past all these people or when you go past them do you feel a sense of community. Does it feel good to see these people?

*Yeah we always acknowledge each other and say hello, that's very nice, the swimmers not so much because they might be in the water. They're wearing wetsuits but he leave a bundle of stuff but yeah maybe not much them. But for the others definitely yeah. I talk to some of the guys I go past.*

Would you feel, I think you might have briefly mentioned this with Tony but would you notice if someone is missing? If that makes sense

*Yeah and the same for me as well because I used to have a dog right. The dog used to run with me and when the dog died everyone was stopping me and asking where the dog was. So that was quite a surprise. I say everyone I mean a handful of people.*

I'm sorry to hear that.

*It was a while ago may last year, don't worry. But people got to know us without having any real conversations if you know what I mean.*

Well its nice that people clearly had this place ballet with you as well and that they kind of reached out to you when they felt like it was needed. Speaking of the swimmers and the chinese couple you mentioned. How many times would you have to run or go down this route for you to not see to notice that they're not there. Would you notice on the first time?

*No not on the first time, maybe ten days. 3 or 4 runs I'd notice.*

Ok so still quite quickly I'd say?

*Yeah*

Ok that's cool, cool is probably not the right word, not cool but…

*Yeah.*

I've got one final question which is about subregions in the park. So you've got quite a straight route in the park just along the river

*Yes.*

So do you notice the park change as you go along it, in atmosphere or from what you see or what you experience in an abstract way?

*Like at the moment when I was running last night loads of kids were out on the green which was nice and a different feeling and you get some people in the morning keeping fit on the basketball court so yeah different parts have different feels for sure. Some are more active for sure you know?*

Definitely.

*As you go down the towpath it gets much quieter.*

Which way on the towpath do you go towards Tesco or do you had to the lock

*The other way so the lock to Tesco.*

~~~~~~~~~~small talk closing~~~~~~~~
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**Lisa (F 50's) video chat**

~~~~Introductory small talk~~~~~

Which park do you use the most out of the two BP or HP?

*Well, normally its BP but not at the moment but ironically, I've walked in BP for 20+ years but not at the moment because of the crowds of people.*

Do you walk a dog or do you just walk for exercise? What is your motivation for walking?

*Dog.*

Ok.

*I've got a dog yeah.*

Do you mind if we talk about HP then?

*Yeah I was there this morning.*

How many times a week would you say you walk in HP a week?

*Everyday.*

Would you say you follow the same route or the same routes in HP?

*Well I live near Molesey Lock so I'm walking from home to the park so the first bit will be the same but then I vary it quite a bit actually when I'm there.*

So part of the study is focusing on routes and atmosphere. So would you say walking from Molesey Lock has a certain, how would you describe the atmosphere? I presume that would be along the river.

*Yes its on the Thames Path. The thing I really like about living here is that its kind of got that holiday feel. When you know its quite a pretty area and you immediately feel relaxed when you first set off down the towpath. You don't feel stressed, just getting out there makes you feel better.*

Do you think having the river so close helps and that the water relaxes you? Is that true for you?

*Oh definitely, yeah. I think, yeah definitely.*

So along that path there's the cricket club and the Molesey Boat Club (MBC), would you say that's less relaxing as there's more crowds or people and less green as you move along the route

*Yeah when you get to MBC, from the point of view as a dog owner, especially recently with the hot weather people have been having picnics it is very stressful as I've got a young dog had she's just into everything so it suddenly becomes a different scenario. The young children particularly as she would probably knock them over.*

So that's interesting. Initially on the route its nice and relaxing and then when you go past the MBC area it gets more stressful and less relaxing and then as you move closer to the park is it nicer again or is it the same?

*Yeah it depends. So in the last couple of weeks id have to say its been quite stressful because there has been so many people. In normal times I would say as soon as I've got past sort of the playground and the large groups of mums and kids and I'm in the park properly with the dog its much better, its fine. Recently its been hell. Probably not what you'd expected to hear.*
~~~~

No that's ok its good to get a wide range of opinions. Another part of the study is about identifying subregions based on the atmosphere or the sense of place. Could you mentally divide HP into different regions? You can use any method of classification to divide it up.

*So there's a definite dog walking area.*

Whereabouts?

*There's a circular path route if you enter the park from the road that's a definite dog walking area we don't tend to get children in that area at all. There's a playground of to the side of it. There you've got children and parents etc. and then the rest of the park is my main dog walking area as well but its not particularly ~~~~~ because in the particular times were in its being used for everything. Basketball, people having picnics, the French game boule that they've introduced. And then I think there's an area by the water where children play and people have created these swings going into the water. So I suppose its quite divide now thinking about it.*

So how would you describe the atmosphere in these different regions you've identified. So for the dog walking area how do you feel when you're there?

*Yeah I mean its fairly relaxed because you have fellow or like-minded people walking there. Especially when you have got the dog you're always conscious of what it might do. Yeah relaxed there. Down by the river I find it very relaxing but recently in the sort of central areas its become very overcrowded but that's only because of the times were in. its normally not, its normally not too bad but there's a lot of people now using that part for different things and its increasingly quite difficult. For me personally as a dog owner trying to find space for us to walk and for her to be off the lead because she is a very active young dog and I need to be somewhere where I can be away from everybody.*

I was just going to ask if you were in with your dog in the crowded area and the car park are these sort of potential, I don't know what the correct word would be, not threats but things you would be more alert around with a dog?

*Definitely.*

So you're more cautious or focused?

*Yeah you're focusing on you know as I depends on the age group of the kids. I mean my dog would run right in the middle of the basketball court and recently there's been loads of people on the basketball court and she just jumps all over everybody so its fine with the dog owners and dog lovers but not so great for the rest.*

So would you say you tend to avoid these areas as a result of that or are you just more cautious when you go there?

*No at the moment I am avoiding, I would avoid it anyway. I suppose I'm having to remap my routes all the time because I just cant you know. I've had in the last week people swearing at me because of my dog because she's run on their tablecloth that's on the ground. Things like that where you get told off. Things like that where it gets a bit stressy.*

That seems very hostile for HP.

*Oh I've got more the language was pretty ripe actually. In the end I ended up having to Esher woods because I couldn't stand it I mean its very – its not normal. I mean during half term last week people would be off to Spain but instead everyone was in our parks.*

It has been very lately. There's one more part of the thesis about a thing called a PB. It's the unintentional convergence of routines…. PB train description… Would you say you experience that with any other dog walkers or any other park users when you're in HP?

*Oh absolutely, all the time.*

Oh ok so is there a community you feel apart of?

*Yeah because I work locally with lots of other local people in my other job, I know lots of faces and they know mine. I've worked for xxxxxxxxx for a long time. So there's quite a lot of people that say hi but don't know any more. There are lots of people I recognise and their dogs as well.*

So it's the dogs as well as humans that are familiar faces.

*I'm afraid it is, quite a sad fact.*

I wouldn't say so! So another measure of the strength of the PB would be how long would it take for you to notice someone is missing who you would expect to see?

*Probably a couple of times. I try and vary my walking where I walk. You know I walk in HP once a day but I take my dog out for 2 walks in a dog so I might go somewhere completely different. But I wouldn't pick up on someone missing but after a few weeks I might think where they have gone.*

So you're not sort of expecting to see someone when you go out

*No not really.*

~~~~closing small talk~~~~~~

**Mary (F 30's) Video call**

~~~~~intro small talk~~~~~~~

So first things first, which park do you use the most?

*Both parks but now id say Hurst Park as its closer but I do go to BP a lot and I did grow up in Hampton Hill which is closer to BP.*

Is it ok to talk about HP because I've had a lot of BP interviews?

*Yeah.*

What would you say your main uses of HP is?

*Cycling, cycling along the river [Thames]*

Is your cycle route wider than just HP. Do you go through HP?

*Yes through HP. I have a toddler so I go there with him too.*

Ok which way do you cycle? Do you go from the Hampton Court side or the Walton side?

*I come from the Molesey end and I go through Molesey to Hampton Court. But I do sometimes go up the river towards Walton.*

And roughly how may times a week would you use HP for this reason.

*At least once a week in a normal situation but currently a lot more.*

It is very busy now, I walk my dog there and there's a lot more picnickers at the moment.

*Yeah.*

Do you just stick to the path? You don't go to any of the other parts of the park or stop off anywhere within the park?

*I stop off at the café so I go out of the park to stop at the café at the Cricket Club.*

Would you say that happens on every trip or is that a rare treat?

*I would say it's a every trip.*

Some of the thesis is focusing on emotion and atmosphere along a route. With your route through the park is there anywhere that you particularly enjoy more than others or conversely anywhere you are more cautious of or weary of along the park?

*It depends on the reason of my trip. If I am going on my own I enjoy the river because its beautiful. But if I'm going with a very unruly 2 year old there's a potential death threat with the river. The river is very dangerous because he has no concept of the dangers. So when I go with him we tend to stick to the wooded areas and he loves those. So they are the two different uses.*

So you would say your park experiences depends on who is with you?

*Completely. Dependent on the company.*

Ok another area of the thesis is focusing on subregions of the park so could you mentally divide HP into different sections depending on any classifications?

*Yeah, coming from the Molesey side going towards the Walton side it's a lot more quieter. So if I was coming from Molesey and turning left into HP that s a quitter area.*

Is that quieter in noise or population?

In population, in people. Whereas if you go right along the river that is more densely populated with more picnickers at any time of year. There's a lot more groups picnicking or groups gathering. You've got basketball courts, the le planque grounds, the ice cream man, the cricket club, the boat club.it is just more densely populated.

Would you say you prefer the more densely populated area or the more quieter side?

*It depends on the company and also we tend to go, we tend to gravitate to the densely populated anyway. We add.*

Do you think that's because there's more to do?

*Yeah I think that is why, there is more to do. If I'm going on my own, so its an adult trip then you've got the cafes, its very pretty, you can look at the river. Its all very lovely. But if I'm going on a child's trip then I've got the swing park, the wooded section so both of those bits. It all lends itself to whichever trip I'm doing.*

Ok and there's another thing but a place ballet --------explaining a place ballet ---------- Do you think you experience a PB currently?

*So seeing the same faces but I don't know the person?*

Yeah

*Yes definitely*

Are the people that you would expect to see in the park? Like you would be surprised if you didn't see them on a trip

*probably not so much at the moment because I am not in a set routine. When I am in a routine I do tend to see the same thing every week at the same time so I guess certain faces.*

Is there a particular point that you would expect to see them or just anywhere in the park.

*Well, not from HP but I have made a friend through meeting at the park because we ended up going to the same park at the same time for about 3 weeks in a row. By the third week we smiled and joked "same time next week?" which then went "same time next week, shall we have a coffee?" Now we are friends and we arrange to meet in the park.*

I like that, that's really interesting and just nice to hear in general. So is it right to say these sort of experiences make you feel you are more in a sort of park community or local community.

It *is the community feel it gives you a lovely community feel and I can't be alone with it.*
No I've met loads of people this week who share very similar feelings as you. Do you mind if we talk about BP really quickly as well?
*Yeah sure, go for it.*
So how often would you say you use BP in a typical week
*Typical week would be once a week, I use HP more.*
Is it the same uses as HP or is it for different reasons?
*I use it for to meet my mum and we go for walks in Bushy. My mum lives in Hampton Hill still and I have a friend who lives in Hampton who we meet up with.*
Do you follow the same routes in walks or does that depend on who you're with?
*All the time we do the same walk, every time (laughs)*
That sounds like you'd like to mix it up or is it a favourite.
*The thing is it's a nice length of walk and it covers a wide part of the park so why change it but yes its one of those. I don't want to walk any further or shorten it. It covers a nice area of the park so why change it.*
Would you say you experience PB along this park then or is it less routine?
*It is less routine in Bushy I think.*
Are there any sort of parts along that route, tying back to HP, that you prefer or that are particularly enjoyable and then some that are maybe less enjoyable. More negative?
*No its not the same as HP. I go there for different reasons and I go on the same walk with mild variation in it. I think there is a level of familiarity because I have lived in the aera for such a long time so there are people I might know, or they went to the same school as me. But I don't think it's the same as HP.*
So, these are more outside the park connections that have been brought into the park?
*Yes, these are external rather than something that is created within the park itself.*

~~~~~~~closing small talk ~~~~~~~~~~~

**Jim (M 40's) online text chat**

~~~~~introductory small talk~~~~~

Firstly, which park do you use the most?
*Bushy Park, and Home park (back of Hampton Court Palace). Hurst Park I use more at times of day I know it won't be too busy.*
How many times do you use Bushy Park in a week? Roughly.
*Everyday lunchtime and after work and also at weekend.*

you say that you use it for exercise - is that for every visit? and what form of exercise do you do mainly (eg running, cycling...

*I'd say exercise is the Monday to Friday and weekend is more leisurely. I do walking, jogging and cycling.*

Do you follow common routes when exercising in BP? or do you mix it up?

*I have about 4 common routes that I know are 5k*

Is it ok to discuss one of them?

*Yes of course. Shall I just describe it?*

*I go from my house opposite Hampton Court station up to main entrance of Bushy Park. Through the gate I turn to the right and go past the little water section then turn left and head up to the kids play park on the right. I turn right there and go straight for about 800m, then swerve left over the Heath to the lake. I go round the lake then head upwards towards the road through the park. Walk up the trees alongside the road and then cut left by Upper Lodge. Then turn back to the left and walk down back to the woodland area. Over the little bridge. And then straight on down to Barrack gates. And then back home along Hampton Green and back over the bridge.*

Thank you very much.

A portion of the thesis is about visualising emotion along a route. Are there any points along this route that you find particually relaxing/enjoyable? And conversely any sections you find more stressful/less relaxing than the rest of the route?

*Any of the exercise I do I always try and make sure is near water. So, I love the section by the lake. Conversely, I dislike the road sections where there are other runners and cyclists to take into account. That kind of adds stress to the activity which in some ways negates why I'm doing it.*

Are there any other potential things you may come across that make you wearier such as a loose dog or a deer during mating season for example? I am also a fan of running along water, really like rivers and lakes.

*When the park is open it will obviously be the cars. I love seeing the wildlife and any animals so deer and dogs are all good.*

Very true, its lovely now without the cars in my opinion! Are there any areas along the route that you tend to see some deer more often? Or do you think they appear more randomly along the route?

*I think it's more random now since lockdown. When the cars are about, I'd say they're more around the heathland areas.*

Thanks. Can you mentally divide BP into subsections or regions? And what would be the rough borders for you? (this can be physical barriers such as vegetation or roads or more mental things such as atmosphere).

*Yes, I think there are distinct manicured green parkland areas for picnics etc, the heathlands areas, the fenced off quieter woodland areas. And the play parks. The rough borders in my mind are just where they change visually. Although in my mind I also have a clear distinction of the 2 sides of the park with the road being the intersect. So, to the left is Hampton and Teddington and over to the right is Hampton Wick and Kingston.*

Do you think the green parkland areas have a different atmosphere to say the play parks and woodland areas?

*Yes, very much. I think the green parkland and play parks are more or less similar with the kids playing and dogs chasing and people having ice creams etc This is very different to the woodland arenas which seem to be more older people or couples or people with pushchairs for example. Much quieter and leafy.*

Thank you. I have one final question regarding "place ballets".

Ok.

Which are the regular unintentional meetings of people in a place (such as a park). You don't know these people but over a period of time you become familiar with their presence etc etc despite not

knowing them personally. Do you think you experience this with anyone in BP when you visit? An example of a non-park place ballet could be seeing the same person who catches the same bus/train as you every morning on your way to work.

*In Bushy Park specifically no I wouldn't say I experience that. On a personal level I pretty much do what I want to do and that's it, so I don't notice specific people too much. At weekends I tend to be with my wife so we'd be chatting and not paying much attention to people that we may be indeed seeing on a regular basis but just not noticing that we have. It's very large a space and even doing the same routes I think it would take a very extended period of time to experience place ballets in that park*

No worries & I agree with you with that. So far, the only place ballet I have identified in BP is with a Park runner who has been visiting for many years

*I honestly cannot think of one person in there I would recognise. But I absolutely get the concept. Just shame it's not in Bushy lol*

~~~~~closing small talk~~~~~
~~~~~

# B – Online Questionnaire Screenshots

**Page 01**
Consent

**Hello!**

Welcome to this survey about improving the visualisation techniques of human geographic phenomena on maps.

This survey is being conducted as a part of M.Sc. thesis "Improving the cartographic visualisation techniques of platial features – the example of London parks" at the University of Twente, the Netherlands.

The survey will ask you about your thoughts and perceptions of proposed visualization techniques and how you interpret them.

**Your participation in this survey is valuable regardless of your familiarity with the fields of geography and cartography.**

This survey should take **15 minutes** and your participation is entirely voluntary. You can skip any questions you prefer not to answer.

Your responses are **100% anonymous** and the information collected will only be used for the master thesis outlined above. **Raw data will not be passed onto third parties.**

If you have any questions, please do not hesitate to ask me at harvey@student.utwente.nl

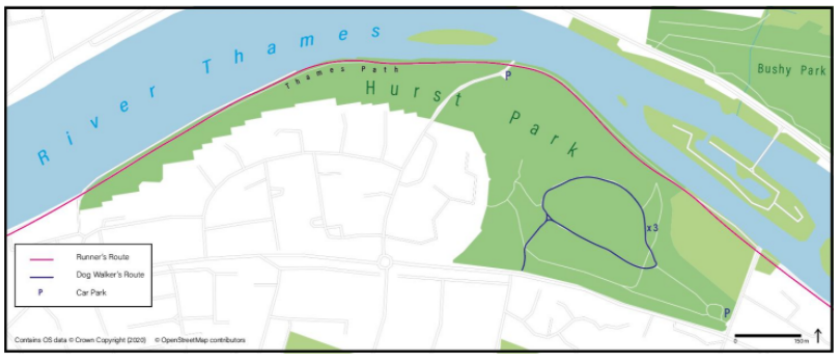
By clicking "I agree" below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study.

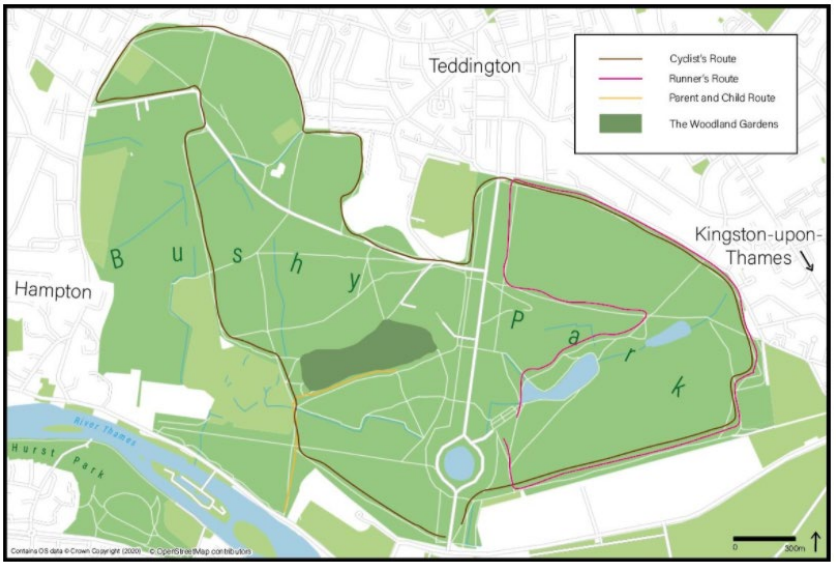
- ○ No, I do not agree (do not participate in this study)
- ○ Yes, I agree

**Page 02**
Intro

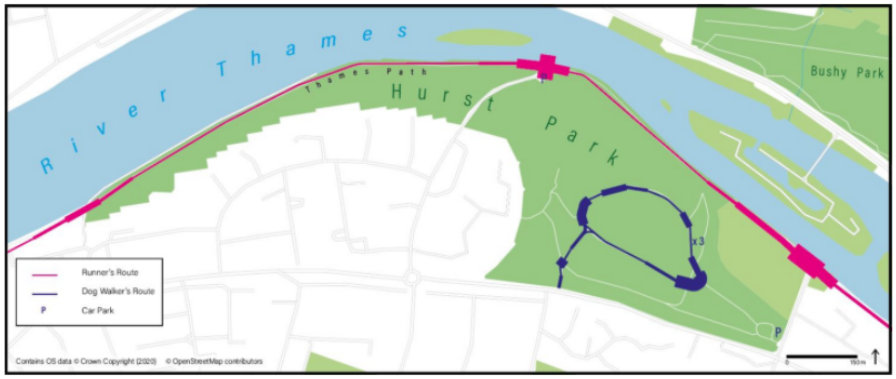
This study focuses on different visualisations techniques that are applied to two parks in the South West London area – Hurst Park and Bushy Park.

Below are maps of both parks with the routes of some park users. Once you have looked at them, click next.



**Page 03**
R1a

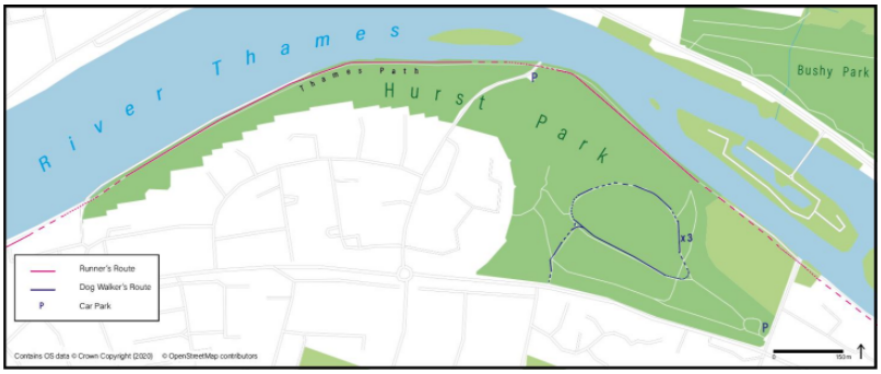



**1. The changing thickness of the line represents...**
Please read all options before selecting your choices.

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...the runner and dog walker's speed | ○ | ○ | ○ | ○ | ○ | ○ |
| ...the runner and dog walker's acceleration | ○ | ○ | ○ | ○ | ○ | ○ |
| ...the runner and dog walkers stress levels | ○ | ○ | ○ | ○ | ○ | ○ |

**2. If you answered "strongly disagree", "disagree" or "don't know" to all the suggestions, what do you believe is represented by the changing line?**

**Page 04**
R1b

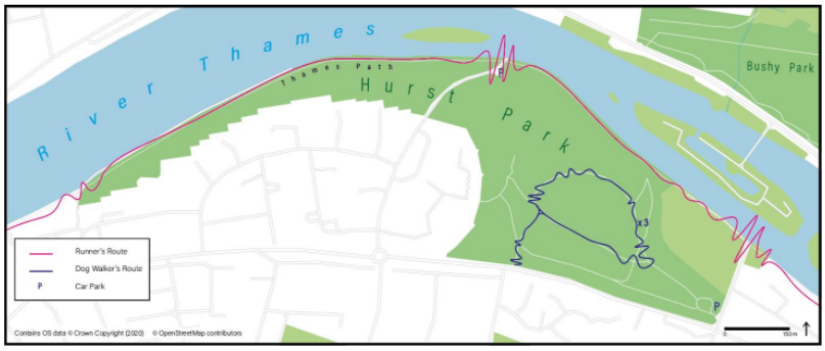



**3. The greater frequency of dashes indicates...**
Please read all options before selecting your choices.

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...a faster travelling speed | ○ | ○ | ○ | ○ | ○ | ○ |
| ...acceleration | ○ | ○ | ○ | ○ | ○ | ○ |
| ...a higher level of experienced stress | ○ | ○ | ○ | ○ | ○ | ○ |

**4. If you answered "strongly disagree", "disagree" or "don't know" to all the suggestions, what do you believe is represented by the changing line?**

**Page 05**
R1c




**5. Large deviations from the path represent...**
Please read all options before selecting your choices.

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...a faster travelling speed | ○ | ○ | ○ | ○ | ○ | ○ |
| ...a greater acceleration | ○ | ○ | ○ | ○ | ○ | ○ |
| ...an increased level of stress | ○ | ○ | ○ | ○ | ○ | ○ |
| The runner runs into the River Thames as they travel through Hurst Park | ○ | ○ | ○ | ○ | ○ | ○ |

**6. If you answered "strongly disagree", "disagree" or "don't know" to the first three suggestions, what do you believe is represented by the changing line?**

**Page 06**
R1d

**7. The runner...**
Please read all options before selecting your choices.

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...is travelling faster when the line turns black | ○ | ○ | ○ | ○ | ○ | ○ |
| ...is accelerating as the line turns black | ○ | ○ | ○ | ○ | ○ | ○ |
| ...is more stressed as the line turns black | ○ | ○ | ○ | ○ | ○ | ○ |

**8. If you answered "strongly disagree", "disagree" or "don't know" to all the suggestions, what do you believe is represented by the changing line?**


**9. This map makes me think that the dog walker and runner...**

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...are visiting the park at the same time on the same day | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at only one location along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at multiple locations along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't interact with each other during their visits | ○ | ○ | ○ | ○ | ○ | ○ |
| ...only took these routes once | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interacted with each other by coincidence | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other on different days in the park | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't know each other | ○ | ○ | ○ | ○ | ○ | ○ |
| ...expect to see each each other when they visit the park | ○ | ○ | ○ | ○ | ○ | ○ |

**10. Using the markers displayed below the image locate where you think the runner and dog walker interact.**

R211
BP_BP_Placement_

**If you think they only interact once, then only use one marker. If you think they don't interact anywhere then please don't mark at all and press 'next'.**

The markers work by drag and drop.

You can reposition markers via drag and drop.


First Interaction

Second Interaction

Third Interaction

Fourth Interaction


**11. This map makes me think that the dog walker and runner...**

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...are visiting the park at the same time on the same day | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at only one location along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at multiple locations along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't interact with each other during their visits | ○ | ○ | ○ | ○ | ○ | ○ |
| ...only took these routes once | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interacted with each other by coincidence | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other on different days in the park | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't know each other | ○ | ○ | ○ | ○ | ○ | ○ |
| ...expect to see each each other when they visit the park | ○ | ○ | ○ | ○ | ○ | ○ |

**12. Using the markers displayed below the image locate where you think the runner and dog walker interact.**

**If you think they only interact once, then only use one marker. If you think they don't interact anywhere then please don't mark at all and press 'next'.**

The markers work by drag and drop.

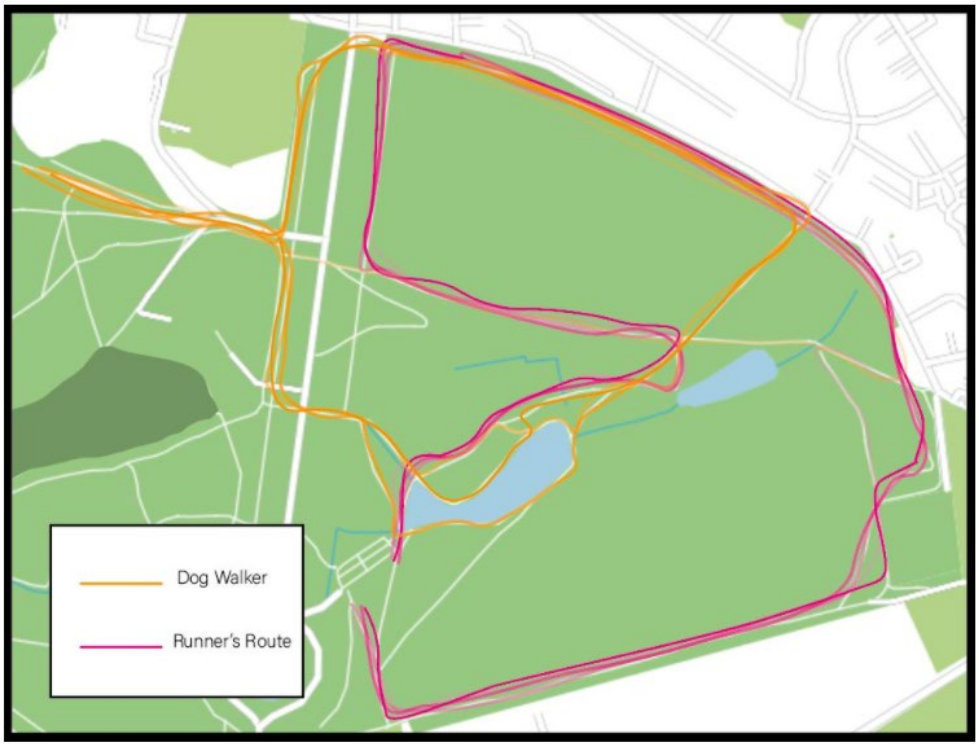
You can reposition markers via drag and drop.


First Interaction

Second Interaction

Third Interaction

Fourth Interaction




**13. This map makes me think that the dog walker and runner...**

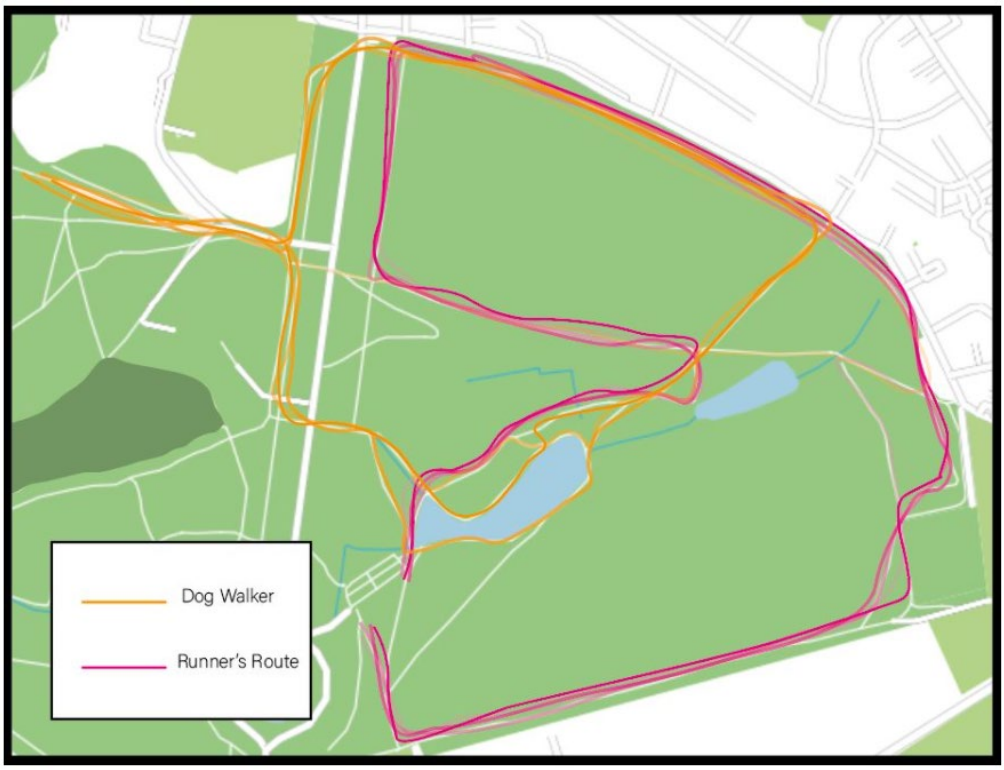
| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...are visiting the park at the same time on the same day | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at only one location along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at multiple locations along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't interact with each other during their visits | ○ | ○ | ○ | ○ | ○ | ○ |
| ...only took these routes once | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interacted with each other by coincidence | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other on different days in the park | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't know each other | ○ | ○ | ○ | ○ | ○ | ○ |
| ...expect to see each each other when they visit the park | ○ | ○ | ○ | ○ | ○ | ○ |

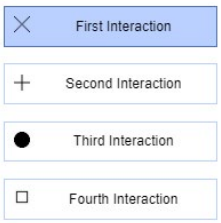
**14. Using the markers displayed below the image locate where you think the runner and dog walker interact.**

**If you think they only interact once, then only use one marker. If you think they don't interact anywhere then please don't mark at all and press 'next'.**

The markers work by drag and drop.

You can reposition markers via drag and drop.


Dog Walker
Runner's Route


First Interaction
Second Interaction
Third Interaction
Fourth Interaction


**15. This map makes me think that the dog walker and runner...**

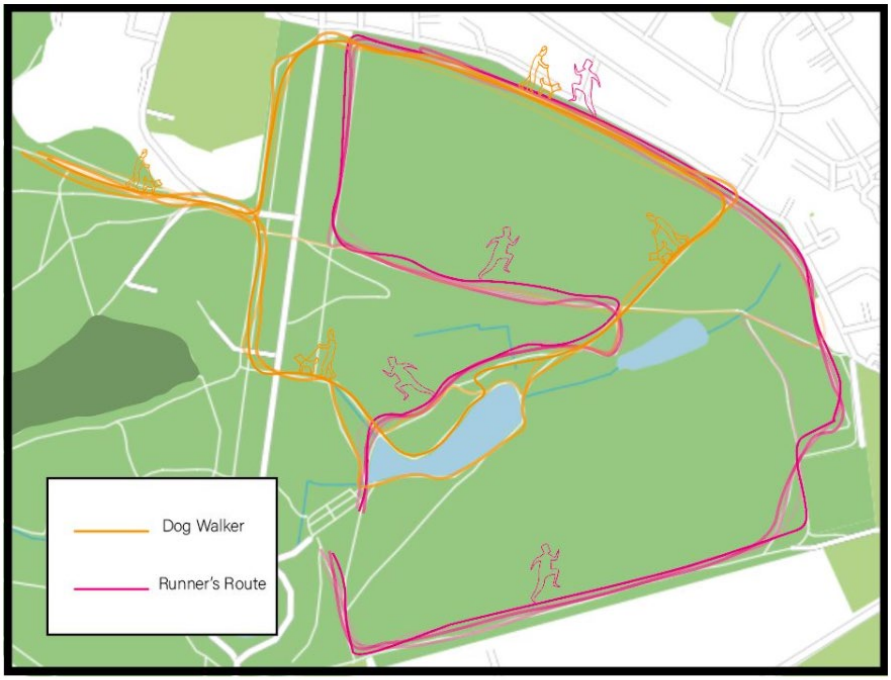
| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| ...are visiting the park at the same time on the same day | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at only one location along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other at multiple locations along the route | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't interact with each other during their visits | ○ | ○ | ○ | ○ | ○ | ○ |
| ...only took these routes once | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interacted with each other by coincidence | ○ | ○ | ○ | ○ | ○ | ○ |
| ...interact with each other on different days in the park | ○ | ○ | ○ | ○ | ○ | ○ |
| ...don't know each other | ○ | ○ | ○ | ○ | ○ | ○ |
| ...expect to see each each other when they visit the park | ○ | ○ | ○ | ○ | ○ | ○ |

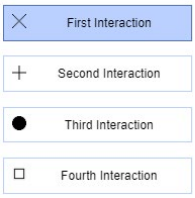
**16. Using the markers displayed below the image locate where you think the runner and dog walker interact.**

**If you think they only interact once, then only use one marker. If you think they don't interact anywhere then please don't mark at all and press 'next'.**

The markers work by drag and drop.

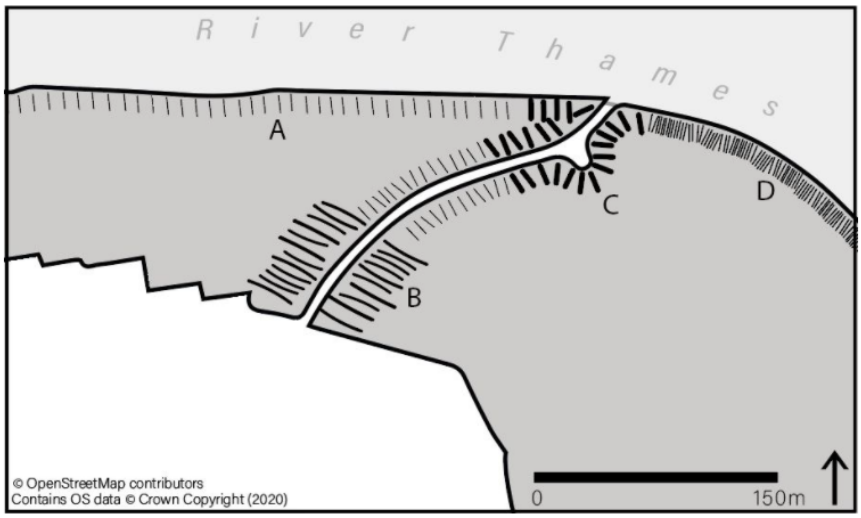
You can reposition markers via drag and drop.


Dog Walker
Runner's Route


First Interaction
Second Interaction
Third Interaction
Fourth Interaction

## Lines of Stress

Here is a snippet of a map of Hurst Park perceived by a parent taking care of a young child. The dashed lines represent stress. Which of the labelled areas do you perceive as the most stressful for the parent?




**17. 1st (Most Stressful)**

[Please choose]

**18. 2nd**

[Please choose]

**19. 3rd**

[Please choose]

**20. 4th (Least Stressful)**

[Please choose]

**21. Using only the following maps as a guide, please select how much you agree or disagree with the following statements.**

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree | don't know |
|---|---|---|---|---|---|---|
| Hurst Park is homogeneous in its park use | ○ | ○ | ○ | ○ | ○ | ○ |
| Bushy Park is homogeneous in its park use | ○ | ○ | ○ | ○ | ○ | ○ |
| Dogs are welcome in all sections of Hurst Park | ○ | ○ | ○ | ○ | ○ | ○ |
| Dogs are welcome in all sections of Bushy Park | ○ | ○ | ○ | ○ | ○ | ○ |
| Deer roam freely in Bushy Park | ○ | ○ | ○ | ○ | ○ | ○ |
| You can play football/soccer anywhere in Bushy Park | ○ | ○ | ○ | ○ | ○ | ○ |
| You can play football/soccer anywhere in Hurst Park | ○ | ○ | ○ | ○ | ○ | ○ |
| There is a wider variety of activities in Bushy Park compared to Hurst Park | ○ | ○ | ○ | ○ | ○ | ○ |


**Last Page**

## Thank you for completing this questionnaire!

We would like to thank you very much for helping us.

Your answers were transmitted, you may close the browser window or tab now.

Luke Harvey, Univeristy of Twente – 2020