

City centre rhythms

The case of gender in Dotonbori

Bachelor thesis in geography with human geographic orientation

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Abstract

Traditional social practice holds the urban night and day in binary opposition – each with a set of unique issues and problems to deal with. While such an attitude can be beneficial due to its clearness, it is at a risk of oversimplifying the fluidity of timespaces. Drawing on Henri Lefebvre’s rhythmanalytical framework and Deleuze-Guattarian assemblage thinking I show how a city centre is not only more complex than dualistic day/night thinking would suggest, but constitutes an assemblage held together by diurnal repetition.

Using fieldwork conducted in Osaka, Japan as a demonstration, I suggest giving consideration to the rhythms of social practice to conceptualize of more multi-segmented timescapes where the social groups in majority follow a repetitive pattern. As an example, I compare the numbers of male and female visitors over time against the opening hours of local shops and restaurants. The research methods used include a combination of structured and unstructured observations in addition to cosinor analysis – a tool developed in chronobiology to test time series for rhythmicity. The results point highly local and temporary timespaces, which may hold implications for planning. An increased consideration of rhythms in local planning may improve predictions for when visitors to an area engage in what kind of activities, and in turn enable optimisations for local policy and planning.

Keywords: Rhythm, rhythmanalysis, assemblage, policy and planning, gender

Preface

This text constitutes my Bachelor thesis in Geography at the University of Gothenburg. At the time of writing it has been over six months since I started engaging with the study of rhythms in human geography, and this thesis is my humble contribution to a topic that I personally believe has received too little attention. During the writing of it I got the opportunity to, once again, visit Osaka – a city that will always hold an important place in my heart.

I would like to extend my thanks to a few people for their help, without which this text would not be half of what it is. First of all my supervisor, Mirek Dymitrow, for his sometimes harsh, but always helpful feedback and for enduring all of my whims. Second, my friend Sakaki Shiori for helping me when my Japanese language proficiency was not up to par. Third, my (now former) classmate Henning Svensson for listening to my incessant complaining during the writing process. Fourth and finally, all my other friends and family who have expressed their interest in reading the final product. Here it is. Finally.

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1. Introduction

1.1. Prologue

It is early morning, or perhaps late night. I am on my way home from a night out at an *izakaya* – a Japanese-style bar – in Dotonbori, Osaka and together with the other revellers I have had to wait for the first train of the day. Since I arrived before sunset much has changed around me: The number of visitors has steadily decreased, neon signs have been turned on and off again, shops have closed and street cleaners and touters have appeared and disappeared. In a matter of hours, commuters, shoppers and restaurant workers will return and the cycle will repeat once again. New and emergent, yet familiar.

My example is hardly extraordinary; anyone who considers a period of time in a city will notice that it is never quiet and stable, it is always in motion. Nevertheless, it is not uncommon for day and night to be presented as a dichotomous relationship (Gallan & Gibson, 2011), a condition which may be troublesome as that division is not always accurate enough to properly represent the shifting social groups utilising a *timespace* – here understood as the time when an activity takes place at a particular location in absolute, Cartesian space. Consequently, more detailed descriptions of urban space at different times could lead to approaching time-specific issues such as violence or advertising more efficiently.

1.2. Background and research problem

As of the past decade, the night-time economy has been largely synonymous with alcohol, disturbance and drug-related issues, and research into it has impacted policy decisions in the UK and Australia (Bohling, 2015; Roberts & Turner, 2005; Sheard, 2011). Others have engaged with topics related to exclusion along the axes of gender, ethnicity and religion (Bromley et al., 2003; Ho, 2015; Schwanen et al., 2012). Most of the literature, however, fails to give full consideration to the entirety of the diurnal cycle. Oftentimes a binary understanding of day and night can be fruitful when planning city centres and other spaces of 24-hour activity. However, adopting more nuanced conceptual approaches to the different timespaces of the diurnal cycle could lead to more exact solutions to time-specific problems (Gallan & Gibson, 2011). For example police presence and advertising could be adapted to become more efficient by predicting the fluctuations of city centre visitors more closely. Furthermore, most Anglophone research on the topic of urban timescapes has been conducted

in a European or American context and there is little information suggesting a general pattern that is not culturally or geographically specific. Little investigation has been made into non-western contexts and even less into the Japanese specifically. Rather, fieldwork conducted in the Netherlands by Schwanen et al (2012) suggests that the participation in nightlife by ethnic minorities can be partially related to difference in cultural attitudes towards alcohol. Accordingly, there is a gap in knowledge regarding what activities interrelate with the presence of various social groups in public space during different times of day. Both in regards to local – that is site-specific – factors: For instance the opening hours of economic establishments, and broader cultural and natural factors such as weather, or attitudes towards alcohol and shopping.

This exploratory study intends to partially fill this void through engagement with Lefebvrian rhythmanalysis and Deleuze-Guattarian assemblage thinking. By exploring the rhythmic presence of men and women in Dotonbori, Osaka during the diurnal cycle, the study attempts to reveal temporal segments of activity as continually re-emerging. I seek to add to existing knowledge of temporal practice in city centres in three principal ways: The first is to expand the knowledge about how the presence of men and women correlates with several temporal entities – local and broader natural and cultural. Secondly, I want to explore the causal links between synchronised entities in public space. The third and final way is that by utilising the rhythmanalytical framework evoked by Henri Lefebvre (2004) in conjunction with quantitative methods as suggested by DeLyser and Sui (2013), I hope to propose a toolset for deriving more intricate knowledge of local spatiotemporal patterns of social practice.

1.3. Thesis statement and research questions

The aim of this study is to examine how visitors and activities in city centres are synchronised into complex temporal patterns, and how knowledge of such patterns may aid our understanding of public space. A case study of men and women in the Dotonbori area of Osaka, Japan will serve as a starting point for an exploratory discussion about how visitor presence in city centres change and repeat following the diurnal cycle. Three questions will serve as guidelines for the case study:

- How does the number of men and women in the publically accessible areas of Dotonbori change depending on the time of day?

- How do other rhythms and activities interrelate with the varying presence of men and women in Dotonbori?
- How can the daily activities in Dotonbori be divided into distinct timespaces beyond the traditional day and night?

1.4. Disposition

The text at hand is organized in the following way: First, a theoretical framework, containing background information regarding temporal patterns of action in city centers, the concept of rhythm analysis and its practical applications, as well as Deleuze-Guattarian assemblage thinking are introduced to the reader. These conceptual considerations are followed by the introduction of the case of men and women in Dotonbori, and, the research methods involved in studying and analysing it. Afterwards, the resulting data is presented and analysed in the hope of answering all three of the research questions, which act as guidelines for the empirical part of the study. The case, though likely interesting on its own – and certainly an important part of the text – serves as a means of exemplifying how spatial relations can be divided into segments. Thus, it is the final part of integrating the empirical findings with the conceptual framework that is intended to be the primary contribution of this study. Knowledge specific temporal segments may be interesting in its own right, but here the aim is to consider the processes, and relations through which such segments emerge.

2. Theoretical framework

To aid in answering the questions posed above, and to lay the foundations of the concluding discussion regarding diurnal cycles in cities this section does the following: Initially it introduces past and present thoughts concerning the 24-hour city and gender relations therein, drawing on studies from Japan and other contexts. This is followed by the introduction of Lefebvrian rhythmanalysis, and concepts from chronobiology, as means of evaluating and thinking about repetitive cycles in timespaces. Finally, it engages with the Deleuze-Guattarian assemblage as it has been used in academic geography. The purpose is to propose a tool for thinking about non-hegemonic timespaces, in which actors often act in conflicting ways and to explore relations of potentially complex causality

2.1. Gender in the 24-hour city

Murray Melbin's (1978) *Night as Frontier* likened modern expansion of daytime activity into night to the colonisation of what is now the western United States. Although not beyond criticism, Melbin's work was one of the starting points for research regarding night-time activity and relates to what has become known as the night-time economy as a primarily urban phenomenon. Gallan and Gibson (2011) notes that night is often viewed as a binary, a dichotomous relationship with daytime, where the latter is perceived as the norm. As a result, night-time activity is thought of as deviating from the activities of day, and this may be one of the explanations for the focus on drunkenness, drug use, violence and disorder so prevalent in studies of the night, as they lie outside the normed daytime activities. Such night-time practices are often seen as problematic and illegal, and they become problems to be solved by policy makers (Bohling, 2015; Bromley et al., 2003; Roberts & Turner, 2005; Rowe & Bavinton, 2011; Schwanen et al., 2012; Shaw, 2014; Sheard, 2011). Exceptions to the dualistic view of day and night include Smith and Hall's (2013) fieldwork with maintenance workers in Cardiff during a continuous 24-hour period. Nevertheless, normative considerations of night and day hold the two as binary opposites.

The participation of minorities and disadvantaged groups in the night-time economy has been studied, but night is often treated as a separate space from day and little is known about the Japanese, or non-western context in the Anglophone literature (Shaw, 2015). One exception is Ho's (2015) study about Japanese women's experiences of the night-time economy in the metropolitan centres of Tokyo and Osaka. Ho writes of a significant shift in women's

consumption practices during the last two decades, with more options for participating in the night-time economy on similar terms as men having become available. Recently, a number of drinks and drinking venues marketed specifically towards women has started to appear. Ho's concluding remarks tell of a shifting urban night space which has become increasingly open to women's participation, as a way "to negotiate and re-negotiate their structural positions within Japanese society through their consumption practices" (Ho, 2015). Yet, Japan remains a patriarchal society (Makita, 2010; North, 2009) and women can still be expected to be disadvantaged during the night-time economy and research from other countries support the notion of a female minority in the urban night (Schwanen et al., 2012; Sheard, 2011). There is, however, little known about how the night-time economy relates to consumption practice of other times of day in Japan.

Other research has shown the night-time economy to be segmented into different periods where activities and supply of entertainment during one period differs from the others. Three distinct segments have emerged. Firstly, there is an evening economy with many restaurants, cafés and cinemas open (approx. 21:00-23:00) which is often the peak of visits to such establishments (Rowe & Bavinton, 2011). The evening economy is followed by the night-time economy proper (approx. 23:00-02:00), characterized by increased activity in bars and clubs. Finally, the late-night economy (which seems to be more problematic in terms of violence and disorder) is the time when the last people are returning home once the bars and clubs close (Bromley et al., 2003; Rowe & Bavinton, 2011). In terms of gender participation, the evening and night-time Economies are more equal than the late-night economy, which is dominated by men (Schwanen et al., 2012). The differences are suggested to emerge out of a number of factors, of which one of the most important ones is the opening hours of different shops and commercial establishments. Indeed, Rowe and Bavinton (2011), as well as Schwanen et al. (2012) support this notion to some extent.

Despite the division of the night-time economy into differentiated periods, daytime is not dealt with specifically in this body of literature, and although it does not necessarily imply a simplistic view of day as homogenous in terms of gender and consumption practices, little is known about how the temporal segments of the night fit into a 24-hour context. Thus, day and night are often seen as separate entities with little interrelation. Such literature has its merits in that it can delve deep into a specific timespace. It is, however, at risk of missing the fluidity of spatial practice as the latter changes around the 24-hour cycle (Gallan & Gibson, 2011).

2.2. *Rhythmanalysis*

One possible way of dealing with the day and night binary which is also suggested by Gallan and Gibson (2011) - is through rhythmanalysis as suggested by Henri Lefebvre. In his last book, Lefebvre wrote about the connection between time, space and expenditure of energy as inherently rhythmic (2004)¹. Considering the rhythmanalytical approach can be a means of rethinking prefabricated temporal categories such as day and night, and instead paying attention to the fluctuations and interrelations of different actors and entities as they relate through rhythms. This subsection serves as an introduction to, and evaluation of, different utilizations of Lefebvre's rhythmanalysis. For Lefebvre, the human body was integral to the rhythmanalytical project, as it is through the body the rhythms of daily life are experienced, albeit often subconsciously. To truly grasp the rhythms of everyday life one has to be within them, but also remain exterior to them. A task that at first might sound impossible. Rhythms are likened to a machine where the moving parts hide the underlying mechanisms; not secret, but hidden from plain view. Lefebvre suggests a balcony or a window situated above a street as a useful location for the prospective rhythmanalyst with an interest in the flow of urban life of the street below. In an example from Paris, Lefebvre notes the following:

“He who walks down the street, over there, is immersed in the multiplicity of noises, murmurs, rhythms (including those of the body, but does he pay attention, except at the moment of crossing the street, when he has to calculate roughly the number of his steps?). By contrast, from the window, the noises distinguish themselves, the flows separate out, rhythms respond to one another.” (Lefebvre, 2004 p. 28)

For Lefebvre the bodily functions are rhythmic; breathing, the beating of the heart and hunger are examples of bodily rhythms. They come together in polyrhythmia, described as a “bundle”, “garland”, or “ensemble”. When the different parts work together, it is in eurhythmia – a state of well-being or health. The opposite is arrhythmia – disease or pathology. Arrhythmia is described as both cause and effect. The human body is not the only such ensemble. Other examples are plants, machines, traffic, and entire cities, as they are also

¹ Originally published in French as *Éléments de rythmanalyse. Introduction à la connaissance des rythmes*, Paris, Éditions Syllepse, 1992, with a preface by René Lourau.

made up of diverse elements with their own rhythms, and together they form polyrhythmias of different durations.

Lefebvre divided rhythms into two kinds: Cyclical and linear. The cyclical can be understood as being of natural origin, a relevant example being the diurnal cycle or the changing of seasons. Linear rhythms, on the other hand, have their genesis in social activity and are inherently human (Lefebvre, 2004). Walking to and from work is an example of a linear rhythm (Edensor, 2010b). However, as Meadows (2010) notes, cycles combine with the linear to create repetitive linearities as social activity become habitual and repeated. The rhythmic patterns of visitors to a city centre – busy during the day, and quiet at night – would then be the cyclical rhythm of day and night infusing social practice with itself. There is, however, another usage of cyclical in Lefebvre's writing: "*The linear, which is to say, in short, succession, consists of journeys to and fro: it combines with the cyclical, the movements of long intervals.*" (Lefebvre, 2004 p. 30). Meadows (2010) notes the difference between the uses of cyclical as being of nature as compared to of longer duration. It is perhaps of less importance to distinguish between what makes up a cyclical rhythm, than to acknowledge that rhythms are diverse and that polyrhythmias (eurythmic or not) emerge when the cosmic – that is of the sun and the moon – combines with the social on a number of different temporal scales. Rhythms are repetitive per definition, yet it is through their repetition that difference is produced. According to Edensor (2010a), rhythms, regardless of being social or natural, are reproduced neither identically nor indefinitely.

Applying this notion to gender participation over the diurnal cycle in city centres, we can assume that no day-night cycle is exactly the same as the other – hardly a remarkable assumption. Edensor also states that normative rhythms are "*only ever partial and susceptible to disordering by counter rhythms and arrhythmia*" (Edensor, 2010a p. 2). In other words, rhythms are not stable and there is room for different agents to shift them, and a range of cultural, social and economic factors can impact the multitude of rhythms that are part of everyday life.

Rhythmanalysis has, however, been criticized for lacking clarity, and it is perhaps best understood as an unfinished project (Amin & Thrift, 2002; Crang, 2001; Edensor, 2010a; Simonsen, 2004) and for all the importance of the body, Lefebvre has been blamed for lacking an ontology of it (Simpson, 2008). How Lefebvre's intended rhythmology to be practiced scientifically is left equally ambiguous. Some practical attempts include Simpson (2012)

covering street performance using time-lapse photography. Others have used more traditional methods; for example Jones (2010), DeLyser (2010), and Meadows (2010) have analysed historical literary sources and works of fiction to search for rhythms of the past, and present. Yet others have used interviews as a way to explore the experience of everyday rhythms (Evans & Franklin, 2010; Jiron, 2010; Simpson, 2008). However, Lefebvre criticised many of these approaches. Pictures, words – both written and spoken – are referred to as mere simulacra in that they may represent rhythms, but they are not rhythms. Rhythms are very much lived, and only by having lived a rhythm can one analyse it (Lefebvre, 2004). Some performatively oriented attempts to use rhythmanalysis include McCormack (2002) in his explorations of time, movement and bodies. Inspired by Deleuze and Guattari’s concept of the refrain (Deleuze & Guattari, 1988), McCormack perhaps comes closest to what Lefebvre intended. Edensor (2010b) is concerned with the rhythms of walking and how they produce time-spaces and yet are subjected to a multitude of regulations and power dynamics. Lefebvre, however, viewed rhythmanalysis as more than just a series of concepts and methodologies. Rather, he saw it as a way of restoring a “total body” (Lefebvre, 1991) and therein might lie the answer to why rhythmanalysis is so difficult to practice. Rhythmanalysis was originally a political project, and, as such, it is perhaps best used as a way of thinking about rhythms and not as a methodology of its own. Nevertheless, rhythmanalysis offers a way of trying to understand the repetitive nature of daily life and its intersections with other recurring activities and phenomena. As the operationalisation of rhythmanalysis is far from preordained, it requires of us that we find ways of practising it. The section above has been an introduction to some of the ways rhythmanalysis has been practised. In this case rhythmanalysis serves as both a conceptual tool, but also as a practical approach to be implemented by the use of a variety of methods which are thoroughly described in Section 4. *Methods and Methodology*. The next subsection will deal with some of the other mentions, and dealings with rhythm within academic geography and beyond. Particularly, a series of concepts to consider causal links between rhythms and their synchronisation will be introduced.

2.3. Zeitgebern, entrainment and synchronisation

Rhythm has been dealt with in Anglophone geography at least since Torsten Hägerstrand introduced time-geography in the early 70s (Hägerstrand, 1970), and in some manner decades earlier (Parkes & Thrift, 1979). One way of studying site-specific rhythms in geography is Parkes and Thrift’s (1979;1980) chronogeography. The chronogeographic approach draws on

the terminology and methods from the field of chronobiology – the study of time’s effect on living organisms – and the Lund school of time-geography. Although Parkes and Thrift (1980) argue for the existence of individually experienced time, in contrast to time-geography which they consider to be overly one-dimensional in its conception of time. This subsection introduces a few key concepts that can be used to operationalise, and serve as additions to, the more abstract writings of Lefebvre.

More specifically, the chronogeographic approach can be adapted to offer a quantitatively oriented framework to complement Lefebvre’s rhythmanalysis. Parkes and Thrift introduce a series of concepts related to the study of rhythms to geography. Originally coined by chronobiologists (Halberg & Katinas, 1973), Parkes and Thrift adapt the terms for geographical use. *Zeitgeber* – German for “time giver” or “that which gives time” - is an “entity controlling or influencing rhythm activity” (Parkes & Thrift, 1980). The process through which a *Zeitgeber* influences rhythms is called *entrainment*. Take for example Lefebvre’s lunar cities of the Atlantic Ocean (2004), echoed by Owain Jones (2010) engaging with the tidal rhythms of England. In these cases, the phases of the moon set the pace for much of human activity; fishermen have always had to take the tides into account and thus their activities had taken on a rhythmic pattern entrained by the waxing and waning of the moon. *Zeitgebern* are not always “natural” phenomena. The opening hours of a museum or the presence of police officers at certain hours can entrain the movement of certain groups of people (Schwanen et al., 2012). *Zeitgebern* does not always entrain in a top-down fashion and there can be room for complex relations of causality as rhythms can work to stabilize one another. However, Manuel De Landa (2002) suggests that more stable agents often entrain less stable ones. Therefore the opening hours of shops may entrain the temporal presence of certain people and activities to a place (Schwanen et al., 2012). At the same time, shops have to adapt their opening hours to when potential customers are available (few shops are open during the nights), and in this way shops and visitors may work together to stabilize the continued presence of the other in feedback loops (De Landa, 1999). Entrainment does not merely imply the entrainment of other entities: It includes an inherently organising component of *synchronisation* – the joining of rhythms in an orderly manner at particular times. That is, not only does a *Zeitgeber* impact other entities, it also has a tendency to adapt them to itself and thereby orders of things in space. In other words, entrainment implies synchronisation which in turn implies territorialisation (Kärholm, 2009) – the claiming of a territory for a particular ordering of entities.

2.4. *The Deleuze-Guattarian assemblage*

This final subsection takes a look at Deleuze-Guattarian *assemblage*² thinking (1988) as a means of describing the fluidity of relations in spaces of polyrhythmia, which later will be argued that Dotonbori constitutes. Assemblage, in its original sense, carries the notions of becoming, event and composition, and is a mode of how heterogeneous agents interrelate to one another (Phillips, 2006). Despite the word assemblage being a noun it carries the sense of a verb, in that it acts and becomes instead of only describing a relationship (Shaw, 2014). According to Shaw, the Deleuze-Guattarian notion of assemblage does not simply denote structures or forms, and is therefore not reducible to particular arrangements (2014). Assemblage refers both to the (human or non-human) agents involved and the process through which these agents order in more or less enduring ways. Furthermore, Shaw argues, Deleuze and Guattari's notion carries two features particular to their thinking of assemblage. The first is that of impermanence, the second of indecision, or, in Shaw's own words:

"...we are not looking at permanent connections between domains of practices, but the instances or places in which they sometimes meet. Second, assemblages in Deleuze and Guattari are ambivalent, that is, they incorporate both those practices which support an assemblage and those which undermine it." (Shaw, 2014 no page number)

Assemblages are held together by territorialising and deterritorialising forces as their constituents come apart or reorganize themselves or leave an assemblage altogether to enter in new relations (Anderson & McFarlane, 2011; Dewsbury, 2011). Places and moments can be claimed by, and for assemblages instead being assemblages themselves. Such claims to places are always temporary but can last for shorter or longer periods of time. Thinking in assemblages entails that causality operates broadly in non-linear ways and works best when attempting to understand how relations spring out of and endure despite their inherent contradictions. Repetition and habitual actions can be part of how relations endure (Anderson et al., 2012). There is, however, a risk that anything and everything becomes described as assemblages, and another risk is that the term loses its notions of verb and becoming and instead becomes a noun akin to network (Anderson & McFarlane, 2011).

² The original French term used by Deleuze and Guattari is *agencement* (see Phillips, 2006 for a discussion of the difficulties involved in translating the term to English).

One should always be wary when combining ideas originating from different ontological frameworks and I am by no means implying that all assemblage are rhythmic, yet there are similarities between Deleuze-Guattarian assemblage thinking and the rhythms of Henri Lefebvre:

“An organ has a rhythm, but the rhythm does not have, nor is it, an organ; rather, it is an interaction. A rhythm invests places, but is not itself a place; it is not a thing, nor an aggregation of things, nor yet a simple flow.” (Lefebvre, 1991 p. 206)

In other words, rhythms are not entities in and of themselves, but relations between things. Neither is a polyrhythmic ensemble synonymous with an assemblage. Rather, orderings can contain rhythms or move and remake themselves in a cyclical fashion, where some agents work to territorialise and others to deterritorialise a given ordering. What makes a cycle or a rhythm, then, is the periodic recurrence or reterritorialization of a familiar, yet original ordering. In their rhythmanalysis of an Irish coach tour, Edensor and Holloway argue that *“rather than seeing the tour as composed through a duality of expected and institutionalised rhythms on the one hand, and unexpected and non-institutionalised on the other, the Ring of Kerry tour is processual and composed through multiple orderings that are never finalised”* (Edensor & Holloway, 2008). The coach tour is more than a dialectic between the expected and unexpected and it continually re-emerges as something different. At the diurnal timescale a city centre may be similar to a multitude of expected and planned events, such as guided tours taking place each day, while at the same time sharing the space with spontaneous or unexpected happenings. Thus, the city is constantly remade and reshaped in new, yet familiar forms.

Deleuze-Guattarian assemblages may not quite be what Henri Lefebvre had in mind when he worked on his rhythmanalytical project. By borrowing from the ontology of the former, rhythmanalysis becomes a potent tool for thinking about repetitious, yet differentiated places, containing a wide variety of activities and how they hold together and endure despite their differences. After all, as Brian Massumi wrote in the introduction to the English language edition of *A Thousand Plateaus*, Gilles Deleuze’s idea of a concept was more reminiscent of a tool box than of a brick (Massumi, 1988).

3. The case of Dotonbori

To investigate the occurrence of temporal segments of male and female visitors compared to local activities, the Dotonbori area in Osaka was chosen as a site for the case study. Dotonbori is an area, which - unlike much of the rest of Japan - never truly sleeps. It is a tourist attraction, a shopping center and a nightlife area, all blended together. It is a cosmopolitan area where visitors with a diverse range of interests come together for an equally diverse range of reasons – and as such it is an interesting case for anyone interested in how visitors and activities come together and shift around the clock. Dotonbori is suitable to study due to the diversity of the area, as an investigation into how the 24-hour city can be thought of as an ongoing reorganisation of relations is easiest to illustrate where there is activity around the clock. Furthermore, a Japanese example can help increase knowledge of non-western contexts.

The Dotonbori Canal in what is now the centre of southern Osaka was finished in 1615, its construction having begun three years previously. Its founder, Yasui Doton, was killed in the failed defense of the nearby Osaka castle before the canal was finished. His cousins finished the project of digging the new canal, and the new lord of the castle agreed to name it after Doton. Soon after completion the surrounding area was designated an entertainment district by the Tokugawa Shogunate, the contemporary rulers of Japan (Dotonbori Store Association, 2015).

Four hundred years later, the Dotonbori area still remains an entertainment district. While most of the theaters and geisha houses have disappeared during the last century, Dotonbori has become a symbol of Osaka. Today, Dotonbori is a sprawling shopping and restaurant district, known throughout Japan and the world for its cuisine and flamboyant neon signs. It has been argued that consumption practices have become more homogeneous across different places (Zukin, 1998), and Dotonbori is no exception. Yet, Dotonbori, like all locations, has some uniqueness to it. Some of the notable attractions include the famous Glico Running Man billboard and the giant, mechanical crab of Kani Doraku. To the north is the nightlife district Soemon-cho, and to the south are several shopping malls. Perhaps because of its rich history, glistening night lights and the wide selection of restaurants and nightlife Dotonbori is often marketed both as a symbol of metropolitan Osaka and as the beating heart of the city.

South of the canal, passing in an east-westerly direction is Dotonbori Street, lined with many dozens of restaurants and souvenir boutiques. To the northwest lies the kilometer long Shinsaibashisuji shopping street which reaches Ebisubashi bridge³, spanning the canal, as the street becomes changes name to Ebisubashisuji and continues southward towards Namba Station. East of Shinsaibashisuji lies the Soemon-cho district which is filled with a multitude of nightlife premises and yet more alternatives for the hungry reveller or shopper.

³ “Bashi” is a variant of the Japanese word 橋 (hashi) meaning bridge. A full translation of the name Ebisubashi would thus be Ebisu Bridge. For the remainder of the text I have chosen to keep and transcribe the Japanese names in their entirety.

4. Methods and methodology

Two complementary approaches were taken to gather data about the presence of men and women in Dotonbori: one of which was a series of structured observations aimed to count the shifting numbers of male and female visitors to Dotonbori which were then analysed using the cosinor method. The other approach was a series of unstructured observations designed to provide more in-depth information about rhythms and synchronisation of several other activities to one another. The rationale behind choosing these methods were: they could help expand the idea of temporal segments, and b) the information they provided could serve as an illustration in the more conceptually oriented discussion at the end of this text. Below follows a considerably more detailed description of the process, beginning with the structured observation, followed by the qualitatively oriented approaches and finally the analytic tools and considerations utilized in rhythm analysing Dotonbori.

4.1. *Quantitative approaches*

4.1.1. Spatial delineation

The main method used for gathering data was structured ocular observation for the presence of men and women in Dotonbori. By strategically choosing places and counting the amount of men and women passing by, it was possible to estimate the flow of people over time. The observations were preceded by a less structured initial observation with the intent of locating strategic sites for the subsequent counting of men and women. The initial observation was conducted by walking the streets of the Dotonbori area four times in a single day, with roughly six hours between each time. Factors taken into account when choosing sites were:

- The number of people in motion during different hours.
- The relative location to local sites acting as potential Zeitgeber, such as economic establishments.
- The composition of the passing visitor groups in terms of gender, age and apparent social standing.
- The heterogeneity within and between the previous factors.

Important criteria for selecting locations were thus that the sites were heterogeneous from one another, while still being located in relative proximity. Accounting for these factors a

selection of potential places were made, all of which were listed together with their observed attributes. A final choice of two locations⁴ was then made for the following reasons:

Ebisubashi – is the most well-known of the bridges spanning across the Dotonbori Canal. Ebisubashi connects Shinsaibashisuji shopping arcade to Dotonbori Street and Ebisubashisuji shopping arcade. The bridge was chosen because it is a natural transition between several shopping areas and because it is highly trafficked. The shopping arcades are primarily focused on fashion and many shops cater towards a clientele consisting of young women.

Dotonbori Street – was chosen because of its central location and reputation as a tourist destination. A majority of the establishments on this street are restaurants, several of which are open until late.

4.1.2. Execution

Due to the study's interest in flows of people, and in order to minimize the risk of counting people twice, stationary people were excluded. Another consciously excluded group of people were those whose gender status could not easily be determined. This group included, but was not limited to, small children. Even so, some instances of failed assessment are likely to have occurred. How this has skewed the results is impossible to quantify exactly, but is likely to be of little importance for the final results. It is, however, important to understand that gender *as it was apparent to the observer* was accounted for in this study, and not as biological sex or as gender categories identified by the observed individuals themselves. The cultural background and experience of the observer may thus have some impact on the final results.

More generally the person conducting an observation is likely to have some impact on the results, either by intentionally or unintentionally interfering with the observed phenomena, or by interpreting the world in a subjective way (Öhlander, 1999). Such interferences can threaten the reliability of a research project, and if a field study is excessively based on interpretation to derive its results it may be difficult for another researcher to repeat (LeCompte & Goetz, 1982). A way to approach such issues can be rigorous description of how and why a project was undertaken. Observations can range from passive (where it is desired to keep intervention to a minimum) to active (such as participant observations), where the observer plays a larger role (Öhlander, 1999). In the context of this study, the observer

⁴ The third location, *Tazaemonbashi*, located to the east of Ebisubashi was excluded from much of the analysis. The reason behind that is the author falling ill, which coincided with the planned observations.

attempted to interfere as little as possible and aimed to be entirely passive. Of course, it is a nearly impossible task to assess exactly how much an observation of this sort impacts its surroundings. However, if any individuals were impacted by the presence of the observer, they would already have been counted for purposes of the study. It is therefore entirely possible, although unlikely, that some individuals were affected by the observations, but it is deemed to be of little importance to the results. When asked about the purpose of the observation the aim of the study was disclosed upfront for ethical reasons.

The observer's role is not limited to his or her subjectivity and extends beyond that (Öhlander, 1999). In this case, the observer's ability to quickly count people in motion was an important factor, which may have introduced an unquantifiable error in measurement, and thus impacted the internal validity – the ability of the study to represent reality (LeCompte & Goetz, 1982). The more people passed by, the more difficult it was to count them all, and at peak hours the actual number of people could be up to 10% higher than observed. However, this is likely to be somewhat offset by other errors, such as counting individuals twice, either by mistake or because they passed the site of observation several times. Measurement errors like these are difficult to avoid as they are largely stemming from human fallibility. The use of a video camera could have remedied some of these issues by making it possible to view footage from an observation several times. Some initial experiments using a video camera were conducted, but due to a lack of equipment capable of capturing high-quality footage in darkness the choice was made to proceed without the use of cameras. Another issue would have been people walking in front of the lens during crowded times as that would have made it difficult to observe those walking further away from the camera. A final reason for not recording was Lefebvre's focus on presence, which has also been discussed by others (Schwanen et al., 2012; Simpson, 2012). Lefebvre (2004) argues that images distort lived experience in favour of representation and that they are therefore inappropriate for use in rhythm analysis. Instead qualitative notes regarding the visitors and activities at different times were kept in a diary, which will be discussed below.

The times of the observations are displayed in Table 1 and the observations were carried out as follows: Every hour, each location was observed for ten minutes, during which time every person relevant to the study, as defined above, were counted by using two mechanical handheld counting devices. The first location observed was Ebisubashi, and five minutes after the finished observation a second one was carried out on Dotonbori Street. After an additional

five minutes waiting period a final observation on Tazaemonbashi was conducted. The purpose of the waiting time between observations was primarily to allow for the observer to change location, but also as a way to avoid counting the same people again, albeit at a different location. The observations were repeated in this fashion every hour for twelve consecutive hours. For the sake of increasing generalisability over time, the observations were conducted in this way for four days (noon-midnight) and one night (midnight-noon). Even though four observations remain a relatively low number, the data should still be more representative than from a single observation, as outliers would be less visible. The midnight-noon observation was only conducted once due to weather conditions and the observer falling ill. Therefore results from that period are likely to be less representative than the noon-midnight observations.

Table 1. Times of all observations at all locations

Ebisubashi		Dotonbori St.		Tazaemonbashi	
Noon-midnight x4	Midnight-noon x1	Noon-midnight x4	Midnight-noon x1	Noon-midnight x4	Midnight-noon ⁵
12:00-12:10	00:00-00:10	12:15-12:25	00:15-00:25	12:30-12:40	
13:00-13:10	01:00-01:10	13:15-13:25	01:15-01:25	13:30-13:40	
14:00-14:10	02:00-02:10	14:15-14:25	02:15-02:25	14:30-14:40	
15:00-15:10	03:00-03:10	15:15-15:25	03:15-03:25	15:30-15:40	
16:00-16:10	04:00-04:10	16:15-16:25	04:15-04:25	16:30-16:40	
17:00-17:10	05:00-05:10	17:15-17:25	05:15-05:25	17:30-17:40	
18:00-18:10	06:00-06:10	18:15-18:25	06:15-06:25	18:30-18:40	
19:00-19:10	07:00-07:10	19:15-19:25	07:15-07:25	19:30-19:40	
20:00-20:10	08:00-08:10	20:15-20:25	08:15-08:25	20:30-20:40	
21:00-21:10	09:00-09:10	21:15-21:25	09:15-09:25	21:30-21:40	
22:00-22:10	10:00-10:10	22:15-22:25	10:15-10:25	22:30-22:40	
23:00-23:10	11:00-11:10	23:15-23:25	11:15-11:25	23:30-23:40	

Weather conditions were an important factor in the choice of days for observation. With the purpose of making the observations directly comparable, only days with no expected rainfall (as predicted by weekly forecasts) were chosen. Precipitation would likely impact the number of people in the area and additionally make gender more difficult to estimate due to the use of

⁵ Observations were not fully carried out due to the observer falling ill.

umbrellas. During the observations, current weather conditions were noted hourly. Because the study is primarily concerned with rhythms of diurnal length or shorter, days as homogenous as possible were desirable. Therefore, all observations took place during weekdays. Holidays or weekends could potentially have altered the composition of the visiting population, which would suggest that the day of the week is an important Zeitgeber. Some limited investigations during a weekend seem to support this hypothesis, as more young and middle-aged men and women seemed to be present in Dotonbori during daytime.

4.1.3. Classification of economic activities

To determine the opening hours of all establishments within the area data were collected using two methods, with some variation depending on the availability of data. The first collection method was through the official websites of Dotonbori and Shinsaibashisuji. Data consisting of the name of each establishment, opening hours and closing hours were collected, as well as any qualitative description of the establishments' operations. Shops that did not have a website for any reason, such as those on Ebisubashisuji, were instead visited and asked for details about their business hours and operations. The visited shops were informed that the data would be used for a research project. Establishments that for any reason could not be found, or were unwilling to provide information regarding their activities were noted as unavailable. The total rate of unavailable shops and establishments on both streets amounted to roughly one in twenty, and in the cases where only opening hours were unavailable most would have been included in the Food or Fashion categories. As will be shown those categories were by far the largest ones, and when interpreting the correlations between visitor presence and opening hours a loss of five percent will likely have had an insignificant impact on the results.

All establishments were then divided into one of four mutually exclusive categories depending on what goods they sold, or what service they provided. The categories were defined as follows:

Entertainment – Nightclubs, bars, karaoke bars, arcade halls, music venues and museums.

Fashion – Clothes, bags, hats, shoes and wearable accessories such as clocks or hair ornaments.

Food – Restaurants, cafés and street food stalls. Supermarkets were not present in the study area.

Other – Convenience stores, drugstores, electronics and phone retailers and everything else which is not included in the other categories.

This particular division was made for pragmatic reasons as to make the number of categories small enough to easily visualize. Moreover, the categories had to be distinct enough to be mutually exclusive. In other words, each establishment was only allowed to be included in one category. Even though care was taken, there were still fringe cases such as small convenience stores that primarily sold food, but also carried other goods. The categories were not predefined, and were determined as the data were collected. Initially the intention was to define categories which were as similar in size as possible, something that proved difficult because the kind of establishments differed greatly depending on which street they were located on. Dotonbori Street is centred on *food*, whereas Shinsaibashisuji consists almost entirely of establishments which have been included in the *fashion* category. Having categories, even if somewhat arbitrary, is still preferable to breaking down the data in its components for the ease of interpretation. Categorisation can help make data more accessible to readers and aid interpretation. If the categories are poorly constructed it can, however, be misleading.

4.2. *Qualitative approaches*

Complementing a quantitative study with qualitative material can aid a deeper understanding of the studied phenomena when dealing with timespaces (Schwanen & Kwan, 2012). Another reason is that quantitative geography long has been considered dichotomous to the critical tradition (Kwan & Schwanen, 2009). Whether or not such claims have any basis in fact is contentious, but by mixing research methods from several traditions one may reach conclusions and insights beyond what either would have led to on its own. Mixed method approaches do not necessarily imply better representations, but they come with the possibility of viewing a state of affairs through different lenses simultaneously (see Law, 2004). One way of collecting qualitative data could be through interviewing relevant informants. Such an approach was not chosen in this study for a number of reasons. When selecting a method, it is important that it stands in relation to, and helps answering, one or several research questions. In this context, using interviews may have been appropriate for answering the question of why individuals chose to spend time in the study area. As this study is largely concerned with the interrelation of the gendered division of visitors and temporal factors, much of the information could be gathered using the quantitative approach described above. Secondly,

according to Lefebvre, rhythms will hardly be noticed by those living within them. While having experienced a rhythm is crucial to its analysis, one has to be positioned outside of it to truly analyze it. For example, Lefebvre used his window in Paris to overview the street below, enabling him, among other things, to notice the rhythms of motorised traffic and its interrelation with pedestrians (Lefebvre, 2004). This leads to a situation where rhythms as experienced by an informant may differ from those truly affecting him or her, simply because of his or her being inside and the rhythms in question. As a way of dealing with this problematic the observer took considerable care to position himself alternatingly outside and within the flows of people and activities. Much care was taken to deliberately regard the perceived rhythms, as to be aware of their existence. Thereby, the issue of externality was dealt with to the best of the observer's ability on both a physical and a mental level.

Adding a qualitative aspect may, however, still be worthwhile. There could exist local *Zeitgebern*, which would be difficult to appraise by quantitative means. As such, a *research diary* containing notes about the fieldwork, stemming from unstructured observations conducted in tandem with the structured counting of visitors, was kept during the period of the field study. The diary was intended to serve as a qualitative complement to the more quantitatively oriented observations, and aided in a more in-depth understanding of Dotonbori's timespaces. Notes about temperature, weather conditions and extraordinary incidents were taken, but also notes regarding smells and sounds. The latter includes violence, excessive drunkenness and public misconduct. Notes regarding the composition of the passing crowd were also kept, such as the presence of tourist groups or police and security personnel. Finally, rough estimates of the crowd's age composition, as well as ethnicity or socioeconomic status were made.

Initial diary entries were made before the main observations commenced, and the diary proved to be an important tool in deciding which locations would be observed. Successive entries were added between observation periods and at the end of each day. The entries accounted for phenomena which had been seen, heard or otherwise experienced during and between observations.

4.3. *Cosinor analysis and interpretation*

To test the collected data for rhythmicity a method called *cosinor analysis* was applied. The method was originally developed for application in chronobiology⁶ (Halberg F., 1967; Reinberg, 1974), but has seen some use in geography (Parkes & Thrift, 1980). Cosinor analysis works by fitting a curve to a dataset, and is applicable even when measurements are non-equidistant, but requires the period, or duration of a full cycle to be known (Cornelissen, 2014). The function for single frequencies is defined as follows

$$Y(t)=M+A\cos(2\pi t/\tau+\phi)+e(t)$$

where $Y(t)$ is the data for times t_i ($i=1, \dots, n$)

M is the MESOR, or Midline Statistic of Rhythm

A is the amplitude

τ is the duration of a cycle, or period

Φ is the acrophase

$e(t)$ is the error term at each time (Cornelissen, 2014; Parkes & Thrift, 1980)⁷

The values used for the cosinor analysis were the results of the quantitative observations. Therefore the rhythm will be less representative of a “normal” night compared to a day. Cosinor analysis does not answer the question of why a phenomenon follows a certain rhythm, but is a way of testing if it is oscillating in nature. It is important to note that the curve generated by the cosinor method is abstract in nature, and in this case it does not equal the real number of people visiting Dotonbori. The purpose of using cosinor analysis here is to test for circadian rhythmicity in male and female presence, but also to aid discussion of temporal segmentation of male or female majority in comparison to ongoing activities (Bromley et al., 2003; Rowe & Bavinton, 2011). DeLyser and Sui (2013) suggest that Lefebvre’s rhythm analytical framework in conjunction with statistical methods can help bridge the gap between qualitative and quantitative methods by combining aspects of both.

Further analysis was conducted by fitting temporal factors such as opening hours of local establishments, information about last trains, and notes from the research diary and the unstructured observations to the raw data used in the cosinor analysis. The aim was to

⁶ The study of the effect of rhythms on different life forms in biology

⁷ Details of the computational steps involved can be found in Cornelissen (2014).

generate correlations between different occurrences in time apparent and, in extension, to discover temporal segments of visitor presence and activity. The results cannot explain why any individual chose to spend time in Dotonbori during the observations. However, should the gap between the number of men and women across different times prove to be significant, it is likely that belonging to either of these groups could have impacted a person's likelihood to visit Dotonbori at a certain time. Moreover, if such a pattern of difference between men and women were to correlate with one or more local temporal factors, those factors could be seen as potential Zeitgebern. By using the methods discussed and described above, we can see how the numbers of visiting men and women respectively change over time and compare it to coinciding activities in Dotonbori such as opening hours of local shops and restaurants and instances of public drunkenness or police presence.

5. Results and analysis

The results of the fieldwork will be presented alongside interpretations of it. Such a presentation format was dictated by the nature of the study, where sheer interpretation of data (much of which were derived from unstructured observations) *is* the study's result (cf. Simpson, 2012; Jones, 2010). Parts of the results and analysis will be showcased using several figures displaying, among others, how the numbers of visitors present in different parts of Dotonbori changed over time. Certainly such figures have something to tell about the state of affairs it represents, but it is nevertheless crucial to take it for what it is: An abstracted representation of a complex reality.

Furthermore, time lends itself poorly to representation. As Grosz (1995 p. 95) put it: "*Time is capable of representation only through its subordination to space and spatial models*". When representing time we are at risk of mistaking the representation for the real "flow" it represents (Crang, 2001). Yet, some instances require us to represent time – the presentation of results in a scientific report is a relevant example – and so it is useful to look beyond the figures and think about urban space as continuously coming alive at different times of day.

The number of people moving through Dotonbori was different each day, and, unsurprisingly, many individuals who were there one day may not have returned the next. Still, the rhythmic pattern was resilient; never exactly the same, but still a pattern of oscillations repeating in space over time. From a relatively low number of visitors in the morning to many times higher just before dusk, and then waning once again as night falls. This pattern is certainly to be expected. Previous research also suggests that men are in majority at night-time (Schwanen et al., 2012), findings which are supported below. However, even the mundane wants consideration.

5.1. *Male and female visitors around the clock*

Figure 1 shows the daily presence of male and female visitors⁸ together with the respective cosinor functions. It is important to remember that each point on the y-axes represents an individual, with his or her own desires and reasons for being in Dotonbori at the time his or her presence was accounted for. If we think of movements through space as lines stretching from one location to another, crossing Ebisubashi would only be a point somewhere along it.

⁸ Note that the data from 00:00 to 12:00 is identical between the days as only one observation was conducted.

With the data and methods available it would have been a truly impossible task to determine each individual's reason for being in Dotonbori, but observing their presence, and considering the implications thereof was not.

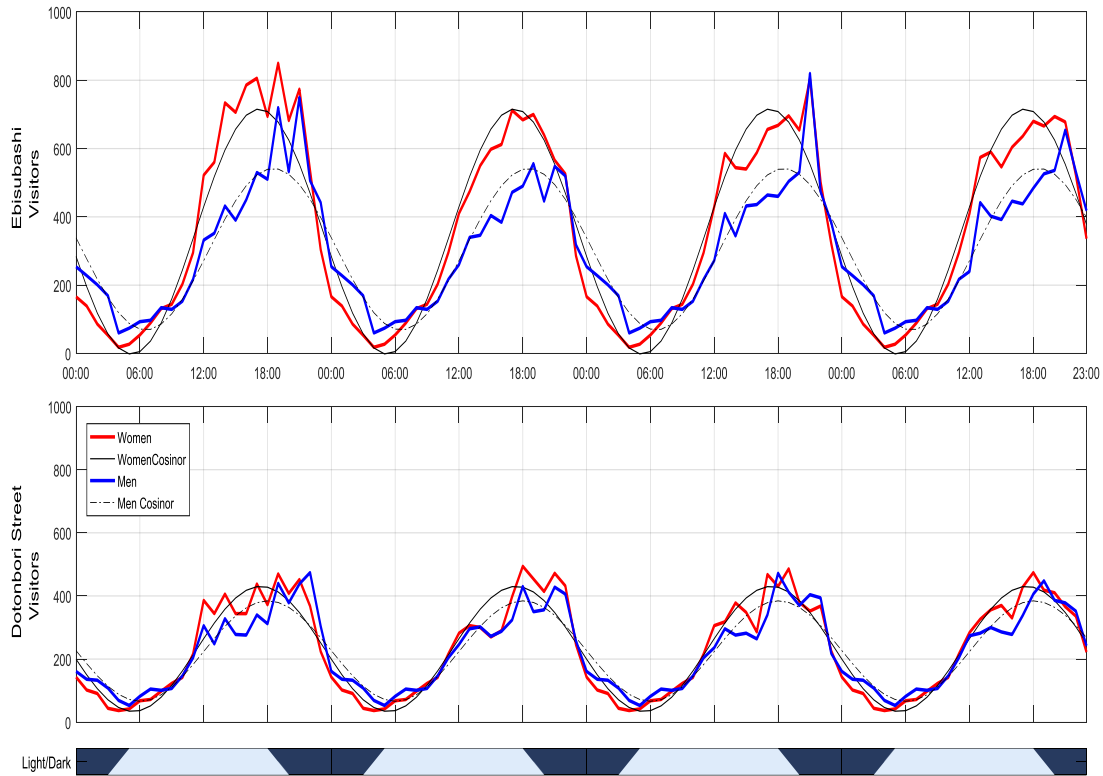


Figure 1. Visitor numbers and cosinor analysis. Source: Author's own work.

The results show a significant fluctuation during the diurnal cycle, following a 24-hour rhythm in the presence of both men and women, despite a few outliers. A few things are noteworthy: First, at daytime the numbers of women was significantly higher than those of men. This disparity was less pronounced on Dotonbori Street, despite a similar tendency. Second, despite the fact that the night-time data are less reliable due to only one observation having been conducted, the number of men was significantly higher than women after midnight – a constancy which continued until after sunrise for both sites. After about 07:00 in the morning, part of the reason for the male majority was the presence of street cleaners, of whom almost all were men. The early hour commuters also were men in majority, which further increased the discrepancy for those hours. After 9:00, the numbers evened out considerably at both sites, leading into the aforementioned female majority, although the change was faster, and more pronounced at Ebisubashi than Dotonbori Street.

The data seem to lend support to the idea that night can be viewed as divided into segments. A more in-depth discussion along those lines of thought and the potential to expand on them follows in the next section. Supporting this idea is the fact that between 21:00 and midnight men and women were present in about equal numbers at both sites, while the previous discrepancy at Ebisubashi disappeared. Whether it depended on an increase in the number of men or a reduction in the number of women varied between the days as is evident by looking at Figure 1.

A final point of interest concerns the decrease in, or stagnation of, visitors to Dotonbori Street at approximately 15:00 each day, followed by a rather rapid increase in both men and women over the following hours. Looking at Figure 2, which plots number of open shops and restaurants according to category, there are relatively many restaurants and other food-related shops on Dotonbori Street. The dip in numbers of visitors present and the subsequent increase could be related to the periods after lunch and the beginning of dinnertime, though such a causal relationship cannot be established with certainty.

5.2. *Economic activity*

Even with just a glance at Figure 2 one can perceive that the economic activity on Dotonbori Street is noticeably different from that on Ebisubashisuji and Shinsaibashisuji. As discussed in the previous section, Dotonbori Street has a multitude of restaurants and cafés, both Japanese and foreign, and comparatively few shops in the other three categories. Compared to the more diverse shopping arcades in its vicinity, Dotonbori Street has more shops open during the night – some of which never close. Despite this, visitor numbers were relatively low at night compared to Ebisubashi. The explanation may be that many people pass the bridge from the nearby Soemon-cho entertainment district, famous for its bars and nightclubs. The site at which the measurements took place on Dotonbori Street may simply not have been a convenient location to pass by, which points to both a weakness and a strength of the method employed – namely that it was very site specific and thereby sensitive to the paths chosen by visitors to Dotonbori.

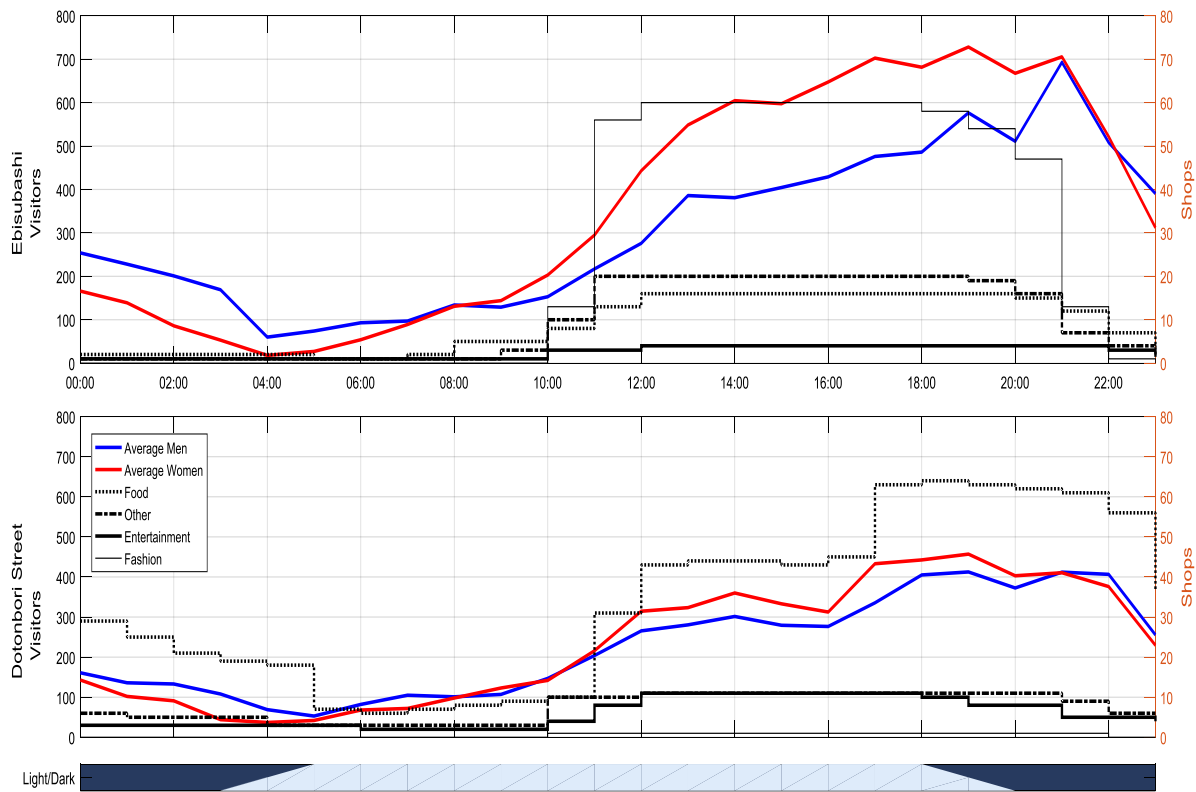


Figure 2. Average visitor numbers and opening hours. Source: Author’s own work.

Looking at the data for Shinsaibashisuji and Ebisubashisuji, the opening hours there are more synchronised with each other, with the majority of shops opening at around 11:00 and closing between 21:00 and 22:00. It is possible that the large number of shops in the fashion category partially explain the significantly higher number of women than men, as many shops explicitly market themselves to a female clientele.

5.3. *Temporal segmentation of activities and visitors*

Figure 3 is a 24-hour clock which shows the different temporal segments of activity in Dotonbori originating from a comparison of the presence of visiting men and women with the opening hours of shops and the qualitative data in the diary. There are a few things to note before delving deeper into each segment. First, the model is based on the quantitative data represented in Figures 1 and 2 in combination with notes from the author’s research diary concerning the visitors and their movements. Second, it is a combination of data from both sites. Despite the fact that there were differences in timing of when transitions between segments took place between the sites, the pattern was similar at both Ebisubashi and Dotonbori Street. What marks temporal segmentation is not necessarily writ in stone, but rather defined as a period heterogeneous from the preceding and following periods in one way or another. In this case, the divisions were based on the opening hours of shops and

businesses, numbers of visitors and the kind of activity the visitors were thought to partake in. Thirdly, this is but one division into segments, highlighting a particular relationship. By considering some other set of factors one might arrive at a very different cycle. Therefore, the temporal segments are not holistic, but partial accounts of Dotonbori. The terminology was borrowed from previous research and kept consistent throughout the diurnal cycle as it was expanded upon by adding more segments (hence the name “morning economy”, even though it can be considered economic downtime if viewed through the lens of consumption). Furthermore, the segments did overlap to a considerable degree and should be viewed as blurred and emerging out of each other, and not as distinct rooms separated by some kind of temporal brick wall.

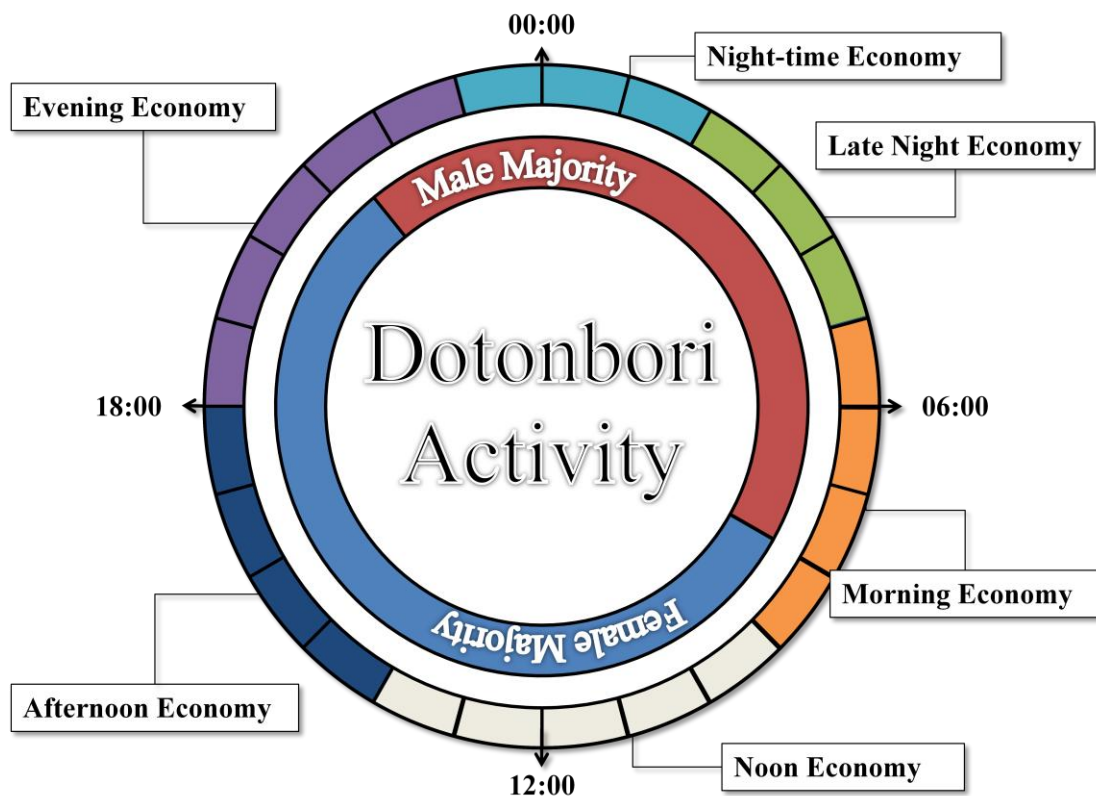


Figure 3. Temporal segments, Dotonbori activity cycle for gender and shops. Source: Author’s own work.

The evening economy – As described by Rowe and Bavinton (2011) the evening economy is a time of varied activity, and this was the case for Dotonbori too. For the first several hours, a large number of shops both in the fashion and food categories were open for business, coinciding with many people leaving their workplaces. With the onset of darkness at 19:00 followed an increase in the number of touters employed to distribute flyers and attract visitors to various entertainment and food establishments. The length of lines to such establishments

also increased on Dotonbori Street. The evening economy was also characterised by a gradual convergence of the numbers of male and female visitors and the subsequent onset of a male majority as well as the closing of most shops on Shinsaibashisuji and Ebisubashisuji.

The night-time and late night economies – At around 22:00, the number of visitors began to decrease at both sites, possibly as a result of the shops closing. At around midnight the last trains of the day departed, and the options for moving out of the city centre becomes comparatively limited. Due to the limited amount of data, it is difficult to say much about the number of men and women during this time, but the limited results and previous research suggest a trend towards an increased male majority. Even during weekdays, publicly drunk individuals were present. Later, at around 02:00, began an increased movement away from Dotonbori, marked by gatherings at restaurants open 24-hours, as the other restaurants and bars gradually began closing. At 05:00, quite few visitors remained, and most of them in groups. No acts of serious violence or antisocial behaviour were noted.

The morning economy – This period begun with a small number of visitors still out after the previous night, but their numbers quickly waned as commuters on their way to what can only be assumed their jobs began showing up at around 06:00. The commuters shared the streets with workers cleaning the streets in preparation for the coming day and later deliveries of fresh fish and other foods began arriving on Dotonbori Street. In general, the morning was a period of relative downtime and little activity compared to the other segments.

The noon and afternoon economies – The noon and afternoon economies were relatively similar, but with a few important differences. Whereas the noon economy was characterised by the onset of activities, such as the appearance of tourist groups and opening of many shops, the afternoon economy was where many activities peaked. It was also the time during which the female majority was at its greatest. The main purpose for the division into separate segments was because of the stagnating number of visitors to Dotonbori Street after lunch hours. In other words, these segments are likely to be very similar or even interchangeable in places where there are few opportunities to eat.

To conclude this section, there seems to be a distinct rhythm to the presence of male and female visitors; female majority during daytime and male majority at night. The opening hours of local shops seem to be significantly synchronised with the presence of visitors and may have some entrainment capacities on who visits the surrounding area, although causality

is not to be taken for granted. Looking at gender, shops and activities it is possible to divide the diurnal cycle into six different segments, or timespaces. Such timespaces should not be seen as panoptic. Rather, they should be thought of as pragmatic divisions derived from comparison of very specific factors. Therefore, comparing a different set of categories may yield different segments. Moving on, I shall explore the idea of using assemblage thinking and theoretically oriented ideas from rhythmanalysis to delve deeper into temporal segmentation and the causes of their shifts.

6. Discussion

Having investigated the case of men and women in Dotonbori it is time to consider the origin of the recurring timespaces and how public space is recreated through daily repetitions. It is important to acknowledge the role of Dotonbori here, as what follows only partially a discussion of the case in particular. Instead the case study serves as a returning example of how the presence of visitor groups follow cyclical patterns, and can be conceptualised of using assemblage thinking in conjunction with a deliberate attention to rhythms. The discussion will be divided in three parts. Firstly, the issue of causality and entrainment will be considered through the lenses of rhythmanalysis and assemblage. Secondly, the duration of assemblages and the length of cycles will be considered together with the location of the different actors involved in shaping city centre timespaces. Finally, potential applications for the approaches will be discussed in the context of urban policy and planning.

6.1. Dotonbori as assemblage: men, women and timespaces

When dealing with complex systems it may be helpful to rethink the idea of causality as simply cause-effect, and instead focus on the relations between the actors involved. This takes us back to assemblage thinking. Assemblages are, as discussed above, the comings together of parts; containing not only one actualisation, but the potential for several others. The possibility for change is always there, as it is part of the assemblage. Like in Lefebvre's rhythmanalysis, repetition carries the seeds of change, and I argue that the rhythms examined in Dotonbori are part of local assemblages, always changing yet repeating themselves as people and the activities they engage in return at similar times of day. Here I am not primarily interested in which entity entrains another, because when dealing with social relations we are always at risk of simplistically representing non-linear relations as linear. What is more, the type of data used in this study is ill-suited to support anything conclusive regarding how strong the entrainment capabilities of different actors are on one another.

However, most activities are synchronised with others, and their rhythms intersect and impact their surroundings. As an example, the number of male and female visitors in Dotonbori varied greatly depending on the time of day. Visiting men and women followed a 24-hour pattern, where the so-called noon, afternoon and evening economies were the busier and nightly segments were calmer in regards to pure numbers of visitors, with the peaks being in the afternoons or evenings. The late night and morning economies saw the least visitors. For

both sites, the numbers of men were significantly higher during the night, an observation which concurs with previous research (Rowe & Bavinton, 2011; Schwanen et al., 2012). The exact amplitude of the pattern is difficult to ascertain due to a small sample size and continuous variation between days. Daytime was more mixed than night, but women were in majority at both sites, significantly more so on Ebisubashi than on Dotonbori Street. This suggests the influence of some local factor during that particular period playing a dominant role. As the discrepancy was synchronised to the opening hours to the shops – many of which market their products towards young women – the relation between the two seems to be rather certain, but raises the question of which entrains the other. It is likely that both visitors and shops share a relationship of dependency on the other, and it is difficult to ascertain which comes first in a causal chain. Although De Landa (2002) suggests that stable factors entrain less stable ones. The opening hours of shops seem to be more stable than the rhythms of visitors, and as such one could assume that the former may entrain the latter. Still, one shouldn't naïvely assume that such a causal relationship exists, but at the very least the synchronisation of some different actors to each other has been established. In other words, there is almost certainly a relationship between the kinds of shops and visitors, but to what extent they impact one another is not entirely clear.

Just as we have discovered that activities and visitors are in synchronisation, the agglomeration of similar businesses in space is a well-known phenomenon (Porter, 1990). In general, shopping, eating and sightseeing are all examples of activities that were common during the noon, afternoon and evening economies, with shopping more prevalent during the former two segments. Dancing, drinking and karaoke, on the other hand, were more present in the evenings and continued throughout the nightly timespaces as Dotonbori slowly calmed down. Each activity took place at roughly the same coordinates in Cartesian space, yet at different times, that is, a segmentation of activities in time. As the sun set, the activities and actors participating in them changed; not instantly, but nevertheless there was a shift. It has been argued that night-time and drunkenness constitutes an assemblage (Bohling, 2015; Shaw, 2014). Heterogeneous actors claim a territory for their activities, but as actors work to stabilise and destabilise an assemblage the relations necessarily change and new orderings actualize only to change again and return the next night in a slightly different yet similar formation. Diverse actors (human and non-human) moved in and out of Dotonbori to create their timespaces, as they engaged in a wide range of activities; from walking to drinking, and from singing to being looked upon, the possible actualisations of what happened was

seemingly infinitely diverse, yet repetitive. We arrive at a conception of Dotonbori as a site of continuous change, being perpetually reformed and remade in slightly new, yet similar patterns. That is, a notion of a place of consumption as a site where stability and differentiation are locked in a continuous tug-of-war. Put in yet other words: An assemblage.

Murray Melbin's (1978) conceptualisation of night as a frontier carried the implication that night was somehow empty – a time for sleep and relaxation that was under increasing pressure from modernity, with frontiersmen taking it into possession. Night stood in binary opposition to day, holding the latter as the norm: a time of, and for activity. Another view would be that while different groups are present at a location at different times of day, the distinction is not always between day and night, and a certain timespace is not necessarily normative. Temporal segmentation akin to the 24-hour activity cycle discovered in Dotonbori occurs when the relations of a group changes over time, as a result of one or several *Zeitgebern*. The timed activities and presence of different groups can coincide in time and space, resulting in potentially volatile situations when interests collide. The presence of men and women is but one of the many relations one can examine during different times of day. The same actors (eg. buildings, men, shops) can also be part of other constellations and temporally bound assemblages (timespaces), where they take on similar or completely different roles; a woman could for example also take the role of a tourist or a chef at a restaurant. These timespaces can, applying Lefebvre's vocabulary, be eurhythmias of peaceful coexistence of groups and activities, or in arrhythmia as different actors with conflicting desires claim the same timespace. The timespaces of Dotonbori showed no signs of major arrhythmia during the time of the case study, but it is possible that some groups are excluded by some direct or indirect process. Indeed, women's lower participation in the night-time economy may be one such mode of exclusion.

6.2. The duration of order and the locations of actors

Before moving on to potential applications the issues of duration, and the difference between local and non-local participants in the city centre assemblage remains: What causes city centre assemblages to endure, change, and eventually come apart? The most basic answer is of course the passing of time itself. On a timescale of a few days, weeks, months or even years, the spatial arrangement of the built environment remains almost entirely static. In other words, the shape and placement of buildings, bridges and streets does not change in any major way. Durability should not be confused with permanence as even houses, roads and

mountains are in processes of becoming, changing. Still, processes of such durations are of little importance to rhythms of roughly diurnal duration and the way such environmental actors engage with other participants in assemblage remains more or less the same from day to day. What about shops, museums and restaurants? Certainly their business hours will impact their surroundings and although their physical being in space is durable their oscillating between open and closed is likely to have some impact on the likelihood them attracting visitors. Thus, shops or museums, as discussed above, are potential *Zeitgebern* for the presence of those interested in what they offer. Moreover, they are components in an assemblage, and their nature as localized and durable is what enables the assemblage to endure and return day after day, instead of drifting away despite its many mobile parts. The built environment anchors the assemblage although many of the participating actors (human beings, cars, rats, beer bottles and so on) are merely passing by or stopping for briefer time.

Here, we return to Lefebvre, according to whom the moving parts obscure the machinery (2004), to De Landa (2002), who sees the process as hidden by the product, with the appearance of that place at a moment's glance disguised the rhythms in motion there. One might perceive a place as fast or slow, when walking through it, but that is nothing but a snapshot of a continuous process of differentiation. As this study shows, the city center is by no means homogeneous in time and is always in a process of changing, or moving. This is true not only for the kind of activity performed, but also for who utilizes a place. In the example of Dotonbori we have seen how the male/female composition of visitors, and the activities they partake in fluctuate depending on the time of day. This may also be true for weekly, monthly and yearly cycles. The number of visitors and the kind of activities they perform, in Dotonbori will likely be different in winter and summer and from week to week, as the climate changes and social markers such as holidays come and go. Thus, rhythmic patterns of different durations interlink in a multiplicity of rhythms as they come together to create garlands, or bundles (Lefebvre, 2004).

Furthermore, cyclical time of cosmological origin – sunset, sunrise, seasons, and tides – infuses linear social activity. Walking to work, shopping, or the promotional jingle played to advertise the latest movies are all repeated. The cyclical comes together with the linear and drives repetition, and therefore changes in social practice. The most basic, and obvious interrelation is that of light and darkness, which is likely to be the *Zeitgeber* above all others due to its stability, being difficult to alter even with artificial lighting. A lower level potential

Zeitgeber for entraining visitors, may as considered above, be shops and restaurants, which were highly correlated with the presence of visitors to Dotonbori. A second one, which so far has not received much consideration, is the availability of public transportation, as it impacts the accessibility of Dotonbori, and which might be helpful in explaining the rather sudden drop in visitors before midnight as that is the time of the last trains. Such a Zeitgeber could be considered spatially external and part of the Dotonbori assemblage by virtue of its capabilities of entrainment, and not because of its location. Another such external relation may be working and school hours, which of course limits who can be present in Dotonbori at certain times. The availability of transportation and the necessity of spending time at another place could be thought of in time-geographic terms as subjecting potential visitors to capability and coupling constraints respectively (Hägerstrand, 1970), and – by considering only the local – we would fail to consider other relevant factors which are part of emerging timespaces. To truly explain *why* a particular timespace emerges several non-local factors must be considered.

With this in mind, what insights from Dotonbori can be brought to other places and contexts? Can a study about the intersection and synchronisation of rhythms and ever-emerging assemblages be used as a conceptual tool to be utilized in other public spaces? Yes, the tools used here are likely to survive a change in setting, but the actualisations of timespaces are not. As supported by the findings here, it is likely that such assemblages are highly site-specific and merely by walking from one street to another a timespace can change completely. Even so, we have – on the one hand – gotten some tentative insight into the process of entrainment as cosmic cycles interlink with the socio-cultural to create recurring timespaces. On the other hand, a local rhythm analysis, as conducted in Dotonbori, seems to do a poor job of explaining causal links beyond those that are located in close proximity to the site of study.

6.3. Applications for policy and planning

Adopting a view of urban timespaces that is beyond binary can have several practical uses. First of all, knowledge of the rather distinct patterns of gender differentiation suggests that belonging to a social group is an important factor determining whether one is likely to visit a certain place at a certain time. This information could be potentially useful for (1) local businesses looking to optimise their hours in an effort to reach the maximum numbers of customers, and for (2) politicians and activists set out to change the composition of visitors by endorsing policies designed to include or exclude members of certain groups. Second,

advertisement aimed towards specific groups can be adjusted to the particular times of their predicted presence. An example of this from Dotonbori is the practise of touting, which has become subject to heavy regulation during recent years (Dotonbori Store Association, 2015). Another example of temporally specific advertising are special lunch deals offered by restaurants. Using a rhythmanalytical approach could help better understand the local timespaces, and therefore open up opportunities for more advertisements of this sort. A third way in which a more-than-binary conception of day and night can be useful is in regulation and policing of a location for the same reasons as above. Fourth and finally, a more in-depth rhythmanalysis than the one conducted here can potentially help in finding Zeitgeber and understanding causal links of entrainment between architectural elements (such as building or streets), visitors and practices. Such knowledge can help create more inclusive city centres during all times of day. Knowing what entities attract, and repel visitors during which times of day can be highly useful for that kind of projects. It is, however, worth mentioning that entrainment capabilities of Zeitgeber are not necessarily homogenous throughout the day – that is, their synchronising abilities may change over time – as the assemblages they are part of deterritorialize.

Further research projects could include investigations of other temporal scales, such as the impact of the seasons on urban activity across different climate zones. Other possible projects would attempt to decipher the apparently complex causality that determines the presence of diverse social groups and activities in cities at different times, or – using GIS-based approaches – to create maps of local timespaces. The latter would need to employ a different set of research methods than this study has done, such as interviews or larger number of observations – possibly a combination of the two. Fourier analysis (see Bloomfield, 1976) could be a helpful tool for deciphering instances of polyrhythmia in which the constituting rhythms are of different lengths.

Lastly, I would like to note that the methods used and suggested here are by no means a universal recipe for perfect understandings of urban timespace. Rhythmanalysis and assemblage thinking can be useful approaches to interpret local relationships of various agents across a temporal cycle. On a larger spatial scale, or a higher-level assemblage, it is uncertain what merit such framework could have, since this would include a larger number of internal specificities and oppositions. In a local setting, the use of rhythm as a concept to bridge the

day/night-binary can be beneficial in understanding the diversity of timespaces as they shift around the clock.

7. Conclusion

As a way of addressing the day/night dichotomy prevalent in studies of urban space (see Gallan & Gibson, 2011), I have aimed to explore the complex the dispersal of male and female visitor presence around the 24-hour cycle in Dotonbori, Osaka. By employing a number of structured and unstructured observation methods in conjunction with cosinor analysis, the gendered rhythms of visitor presence was compared against the opening hours of local shops and activities, and subsequently divided into temporal segments. The results point to a synchronisation between the kind of shops that are prevalent in an area, and who visits the area. In addition, previous studies pointing to gender inequality during night-time are supported.

Furthermore, I have argued that the aforementioned temporal segments are not generalizable across all spaces, and that by utilizing Deleuze-Guattarian assemblage thinking in combination with Lefebvrian rhythmanalysis one can arrive at more general conclusions of the role rhythms play in ordering urban space. Using the case of Dotonbori as an example I have shown how a range of natural and social rhythms can come together and structure city centre activities. Finally, I suggest that by applying the methods and theoretical considerations I propose one can analyze a diverse range of local rhythms, and how they relate to one another. Doing so may yield more accurate understandings and predictions of who visits urban spaces. Thus, increased consideration of rhythms may have implications for policy and planning on microscales.

8. References

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