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Mapping the gendered city: investigating the socio-cultural influence on the practice of walking and the meaning of walkscapes among young Saudi adults in Riyadh

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ABSTRACT
Walking is a mode of perceiving the city which also contributes to health and social benefits. This paper studies the influence of the socio-cultural aspects on the practice of walking and the meaning of walkscapes in Riyadh, one of the most auto-dependent and gender-segregated cities on the Arab Peninsula, where socio-cultural values and restrictions regulate men and women’s use and access to public spaces. The methodology used is a combination of movement tracking data using GPS technology and map-based workshops where participants can reflect on their walking behaviour and spatial preferences. The results of mapping where the respondents walk show a city consisting of gender-specific walkscapes. Indoor environments, such as shopping malls, function as ‘urban shelters’ for women, so they use such spaces for walking. On the other hand, young men mainly walk in urban streets, which provide greater opportunities for gender interaction. However, streets are socially conceived as men’s walkscapes, which limits women’s presence, especially at certain times of the day. This paper reveals how walking experience, tempo-rhythm, sense of place and range of walkscapes are not only determined by ‘universal’ spatial qualities but also influenced by socio-cultural settings.

Introduction
There is an emerging concern to improve the quality of life in cities; the sustainable, healthy, lively and safe city has become a goal and a challenge for the twenty-first century. The promotion of walking as an active travel behaviour and the greater focus on pedestrian-friendly spaces in planning policies contribute to the achievement of these goals. Walking has health and social benefits; it reduces the probability of developing obesity and diabetes (Alfonzo et al. 2014; Walljasper 2014) and contributes to an increased sense of safety (Hajer and Reijndorp 2001; Gehl 2010). In addition, walking creates opportunities for social interactions and urban encounters; Gehl describes it as, “the beginning, the starting point. Man was
created to walk, and all of life’s events large and small develop when we walk among other people. Life in all its diversity unfolds before us when we are on foot … Regardless of the purpose, a walk in city space is a forum for the social activities” (2010, 19, 120). It is a living process in which we, in motion, experience the city and its spaces (Wunderlich 2008).

Many researchers have been studying the practice of walking in relation to the physical setting of space. Weinstein Agrawal, Schlossberg, and Irvin (2008), Gehl (2010) and Bosselmann (2008) highlight the spatial quality of walkways as a key factor in facilitating walking practices. However, the experience of walking is not only influenced by the aesthetics of the surroundings but also the quality of the context as a whole; walkers not only experience the surrounding environment passively but also as active actors in the space (Burckhardt 2015). This means that the practice of walking is influenced by the individual’s perception of space as well as the way other people use it. The focus on studying the practice and experience of walking reveals a wide spectrum of environmental qualities that can be interpreted as walkscapes (Careri 2002; Wunderlich 2008).

In this paper, walkscapes is used as a concept that embraces the physical setting of the actual practice and experience of walking. The current physical settings of urban spaces and infrastructure have been criticized for being standardized for the ‘generic user’ (Phadke, Ranade, and Khan 2013), thereby failing to address other aspects such as culture, religion, gender or class which may have an influence on how the space is used and perceived (Fenster 2005; Phadke, Khan, and Ranade 2011; Whitzman 2013). According to Massey (1994), gender is one of the cultural dimensions that should be considered in the analysis of space. For example, women’s awareness of potential harassment affects their temporal presence, spatial belonging, territorial behaviour and their sense of comfort in public spaces (Fenster 2005; Phadke 2012; Sur 2014). Studies across cultures on gender norms and use of space in the global south have shown how socio-cultural aspects and religious values regulate women’s spatial behaviour, dress-code and daily practice, and therefore shape the spatial and temporal extension of women’s walkscapes differently to men’s (Morin and Guelke 2007; Rieker and Ali 2008; Whitzman et al. 2013). The presence of women in urban spaces in these socio-cultural contexts is much more than an issue of generic spatial qualities of the space; it is a process of negotiating social and cultural bounds, a claim for their right to the city and a key to inclusiveness in urban spaces (Phadke, Khan, and Ranade 2011; Klodawsky et al. 2013). Therefore, the social, cultural and physical aspects of walking articulate the meaning of walkscapes. Accordingly, this paper investigates the socio-cultural influence on the practice of walking and the meaning of walkscapes among young adults in Riyadh, Saudi Arabia.

**Contextualizing the city of Riyadh, Saudi Arabia**

Riyadh has a very recent history; it was hardly known until King Abdulaziz Al-Saud took over in 1902 as an independent Governor and started his campaign to establish the modern Saudi Arabia. Up to 1950, the city still had the character of an old Arab ‘madina’ and the population did not exceed 84,000 people (Al-Hathloul 1996; Mubarak 2004). During this period, the vibrant city life was concentrated around the ‘souq’ and the vitality of this space was created through a combination of formal and informal commercial activities in a central open space (Abalkhail and Al-Naim 2010). Like any other Arab Muslim city, the city and its neighbourhoods formed a hierarchy of streets and open spaces, moving from ‘semi-private’ residential areas to ‘public’ spaces which mainly consisted of commercial buildings and institutions.
This hierarchy meant that streets played a major role as the dominant public space in the daily life of local people and provided a platform for social and cultural activities (Al-Hammad 1993).

A turning point in the modern history of the city came in 1953 when the government decided to move the administrative agencies from Mecca to Riyadh and the city subsequently became a centre for the migration of people to find jobs or establish businesses. As a consequence of the oil boom, which took place at the same time as a rapid growth in the population and size of the city during the 1960s and 1970s, there emerged a need for a planning strategy to control and manage the expansion (Menoret 2014). This task was given to Doxiadis Associates and the comprehensive plan was based on a model with a basic component of a 2 x 2 km super-grid connected by main arteries. This led to a shift towards a new urban form for the city. Such modernistic approaches to city planning have received profound criticism as they attack the street life and give less consideration to the local culture in relation to the use of space (Jacobs 1961; Holston 1999; Gehl 2010). Local planners argue that the strategy by Doxiadis had led to automobile dominated travel behaviour in the city (Al-Hammad 1993; Al-Hathloul 1996; Garba 2004). In addition, shopping malls were introduced to the city in the late 1970s with big boxes containing large car parks and air conditioning, which changed the nature of shopping so that it came to resemble a form of entertainment taking place in indoor environments (Abalkhail and Al-Naim 2010). In fact, micro-climate has a temporal impact on the use of outdoor spaces; the average annual temperature is around 30°C (JRCC 2016) which has a detrimental effect on comfort when walking in urban spaces during the daytime, especially during the warm seasons (Table 1). As a result, current statistics show that more than 98% of trips in Riyadh are made by private automobile (ADA 2003). All these factors made the blueprint for a new car-dependent metropolis in which pedestrian and urban activities were hardly to be practised in daily life at all.

At the start of the 2000s, Riyadh municipality realized that there was a significant lack of public urban spaces for people relative to the size of the city and its population, which had reached more than 5 million people (Statistical Yearbook 2010). Therefore, planners started to rethink its spaces in order to provide people with environments where they could engage in urban activities. In 2004, the municipality started the Humanizing City Spaces campaign, which aimed to reclaim the human dimension of the city by creating spaces for urban activities and especially spaces that promoted walking (Al-Ayaf 2015). The campaign has three major planned types of spaces for walking: (1) Promenades and Walkways; (2) Neighbourhood Gardens; (3) Neighbourhood Sport Fields. The city has been implementing these elements extensively over the last decade. However, in addition to the physical settings, local culture and social norms play a key role in the way people use the city and its spaces. For example, one major outcome of the local culture is gender segregation in the city, which Meijer (2010)

**Table 1. The average monthly temperature in Riyadh (JRCC 2016).**

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
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<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average high °C</td>
<td>20.2</td>
<td>23.4</td>
<td>27.7</td>
<td>33.4</td>
<td>39.4</td>
<td>42.5</td>
<td>43.5</td>
<td>43.6</td>
<td>40.4</td>
<td>35.3</td>
<td>27.8</td>
<td>22.2</td>
<td>33.28</td>
</tr>
<tr>
<td>Average low °C</td>
<td>9.0</td>
<td>11.2</td>
<td>15.2</td>
<td>20.4</td>
<td>25.9</td>
<td>28.0</td>
<td>29.3</td>
<td>29.2</td>
<td>25.9</td>
<td>21.2</td>
<td>15.5</td>
<td>10.6</td>
<td>20.12</td>
</tr>
</tbody>
</table>
describes as one of the defining features of Saudi Arabia, deriving its power from the religious fatwa. This segregation is present in all aspects of city life including working and educational environments, restaurants and coffee shops, all of which have two physically separated sections; one for ‘families’, which includes single females, and the other for ‘singles’, which means males only. This arrangement is monitored and enforced by the religious police. Although Abu-Lughod (1987) argues that the separation between the genders is one of the features of Islamic cities, some researchers claim that the intensity of the segregation between the genders in Riyadh was not a traditional practice before the 1960s (Al-Khidr 2010; Le Renard 2008). However, in contrast to the growth of Riyadh city over the last four decades, which includes new modern urban spaces, skyscrapers and shopping malls, the segregation between the genders, according to Le Renard (2013) and Al-Khidr (2010), has been maintained, renewed and re-invented which makes it more significant in today’s daily life. An example of this re-invention is the women-only shopping mall. The new Riyadh-Metro project, which is under construction and will be integrated with a massive public transit system by 2018, will also reproduce the gender segregation by dividing the metro wagons into ‘singles’ and ‘families’ (ADA 2015).

This gendered segregation of public spaces together with women’s spatial restrictions comprise the urban challenge in creating inclusive spaces in the city. Women have to plan their outdoor movement in a daily routine with a male family member if they want to drive anywhere as the law forbids women to drive (Le Renard 2013). Even women from middle-class families who own cars and have private chauffeurs have to get permission from their parents or husbands, and in most cases they are only allowed to go out with a male member of the family (Al-Hussayen 1996; Le Renard 2013). While the official reason for the segregation is to protect women, a consequence has been the proclamation of women as a dis-empowered social group with limited access to many spaces in the city (Le Renard 2008). The gender segregation in the current urban spaces is derived from four dimensions: social and cultural norms, religious values, government legislation and the physical settings of the urban form. It severely hampers women’s opportunities for walking and the connected health and social benefits. However, among all gendered spaces in the city such as schools, universities, hospitals, restaurants, government institutions, offices and other public spaces, only streets and sidewalks to some degree function as potentially inclusive spaces where men and women can be co-present. This makes it even more interesting to investigate and explore how walking as an urban activity is perceived and practised in the context of Riyadh.

**Aim and objectives**

This paper studies the socio-cultural influence on the practice and experience of walking and investigates its impact on the perception and reproduction of values and meanings of ‘walkscapes’ among young adults in Riyadh through the following questions:

(a) What type of urban spaces do young adults walk in and what patterns of walking do they produce?

(b) How is the range of walkscapes bounded by social and cultural norms?

(c) How do socio-cultural aspects influence the meaning of walkscapes among young adults?
Walkscapes: social, cultural and physical aspects of walking

Even though walking may either be described as a mode of transportation to reach a particular destination or as a recreational practice where one enjoys the walk and the surrounding environment (Knox 2005; Gehl 2006), Burckhardt (2015) argues that every walking trip comprises a bit of both. He describes walking as “a sequence, as a string of pearls that demands a feat of integration, namely to produce an image of a typical landscape” (2015, 243). Many studies focus on understanding the correlation between the practice of walking and the physical qualities of the walkway. Weinstein Agrawal, Schlossberg, and Irvin (2008) claim that direct and safe walkways are enough to promote walking, at least for commuters or walkers with a specific goal. Gehl (2006, 2010) studies walking through two practices, necessary and optional, and claims that optional walking activities such as ‘strolling’ require aesthetically pleasing spaces. He also observes walking in relation to the feeling of comfort through spatial qualities such as sidewalk capacity, length of the trip and the sequential experience, and argues that people are willing to walk longer if the quality of space is high. This is also supported by Bosselmann (2008), who argues that the sense of time when walking is influenced by the level of stimulus provided by the environment. Supported by a series of surveys with groups of pedestrians, Bosselmann claims that time is perceived to pass more quickly in spaces filled with interesting experiences, while in spaces with fewer or no experiences, time is perceived to pass more slowly (2008). However, Burckhardt (2015) defines walking as a mode of perception and focuses on what people actually encounter during a walk, which highlights the importance of the context in terms of its physical aspects and cultural meanings for understanding walking experience. Burckhardt (2015) and Meggyesi (2013) apply the terms, ‘promenadology’ and ‘strollology’, respectively, which encompass both the perception and reproduction of values and meaning of the space in the walkscape, arguing that a space is socio-culturally constructed and is only meaningful when people populate it. The theoretical framework for the empirical research of this paper explores the influence of socio-cultural aspects on walking experience, tempo-rhythm, sense of place (Wunderlich 2008) and range of walkscapes.

Socio-cultural aspects contribute significantly to the use and perception of urban environments (Rapoport 1977; Valentine 2001; Mehta 2013). Rapoport raised the issue of the homogeneity of physical urban environments in relation to cultural differentiations. He stressed this in his concept of clustering, where the city is seen as a set of areas which different groups of people choose to use based on their perception of particular environmental qualities. Within a ‘cluster’ people share unwritten rules that maintain their lifestyle and behaviour in the space. This tends to develop different social group identities which define the users of walkscapes/public spaces in terms of ‘us’ and ‘them’ (Rapoport 1977). The clustering is a form of exclusion, which may not only be determined by the geographical distribution, but which could also be temporal within one area, e.g. the types of social groups using/gathering in the space either during the day or night may change the time when some social groups can be present. In other words, the way we perceive the behaviour of the people we encounter influences our presence in the space. In addition, the ‘universal’ spatial qualities of urban spaces contribute to this exclusion as they are standardized for the ‘generic user’ (Phadke, Ranade, and Khan 2013), thus ignoring a wider understanding of the social and cultural impact on the use and perception of space. Studies on gender and use of space highlight that men and women perceive urban spaces differently (Valentine 1989, 2001; Phadke 2012;
Whitzman et al. 2013; Khalili 2016), which influences their spatial belonging, territorial behaviour and sense of comfort (Koskela 1997; Fenster 2005; Whitzman 2013). For example, women’s lack of safety in urban spaces has been correlated with the masculinization of the space, which influences their spatiotemporal presence (Sur 2014; Khalili 2016). Women’s safety is not necessarily only associated with experienced violence as fear of crime, ‘soft’ forms of verbal or visual harassment may also have a significant impact on women’s experience in public spaces (Viswanath 2013). Socio-cultural aspects can also make the issue of women’s safety in urban spaces more complex, which goes beyond its correlation with masculinization. Gender norms and traditions prescribe behavioural codes to maintain what is socially perceived as ‘appropriate’ behaviour for women (Morin and Guelke 2007; Rieker and Ali 2008; Le Renard 2013; Whitzman 2013; Jin and Whitson 2014). Therefore, in order to protect their social reputation and modesty, women in many global south cities use tactics to negotiate their presence in public spaces in order to mitigate the risk of violence or fear of being socially stigmatized by self-regulating the types of places and time of day when they use and access urban spaces as well as by self-policing, i.e. remaining alert to any potential harm that might happen to them while in the space (Phadke 2012; Sur 2014). For example, Gökarıksel’s (2007) study in Istanbul shows how veiled women choose to go to specific shopping malls where they can maintain their lifestyle. Fenster’s study (2007) on Mea Shearim, one of the oldest Jewish neighbourhoods in Jerusalem, where the residents seek to apply the orthodox dress code to all women entering their area, has associated Mea Shearim with physical discomfort and tension and women try to avoid passing through it. In addition, women in these socio-cultural contexts need to justify their presence in public spaces in order to be socially accepted, which can be observed in their purposeful spatial behaviour such as shopping, carrying something or moving fast towards a destination (Phadke 2012; Whitzman 2013). These examples show how socio-cultural aspects have influenced women’s use of urban spaces and, thereby, limited their walkscapes in the city. Consequently, at night, women in many global south cities choose instead to only use ‘privatized’ public spaces such as shopping malls and gated communities (Khalili 2016). Carmona (2010) classifies shopping malls as internalized spaces, distinguishing the characteristics of their publicness as ambiguous spaces. Although they might not be precisely public spaces, women in global south cities feel much safer in shopping malls so they use such spaces to hang out and socialize (Sur 2014). This also demonstrates how urban public spaces are shrinking for women.

However, urban public spaces are sites where we encounter strangers (Hajer and Reijndorp 2001) as well as platforms where traditions and norms can be reinforced, negotiated or contested (Whitzman 2013; Jin and Whitson 2014). Many architects, urban designers and planners assume that modifying the physical setting will change cultural practices and argue that people’s behaviour in public spaces occurs within a universality of human needs (Bosselmann 2008; Gehl and Gemzøe 2008; Gehl 2010). However, in many global south cities the spatiotemporal presence of women in urban spaces is a process of negotiating social and cultural bounds, a claim to their right to the city, and a key to inclusiveness in urban spaces (Phadke, Khan, and Ranade 2011; Klodawsky et al. 2013). This complex set of social, cultural and physical parameters may challenge the application of ‘universal’ spatial qualities which makes the design of inclusive urban spaces even more challenging. Investigating the influence of socio-cultural aspects on the practice of walking and the meaning of walkscapes paves the way to exploring a wider spectrum of correlations between social, cultural and physical qualities that may feed into the design parameters of walkscapes. Thus, the results
of this paper are not only relevant for young adults in Riyadh, but are also beneficial to the extensive and growing body of literature on gender norms and the use of urban spaces, especially in the global south.

**Methodology**

To answer the research questions, an innovative methodology was needed in order to map, measure and investigate the practice of walking and the meaning of walkscapes among young adults. Traditional approaches of studying public life (Whyte 1980; Bosselmann 2008; Gehl and Svarre 2013; Mehta 2013) and their methods of observing pedestrian behaviour such as counting, tracing or tracking are useful for gathering data on density and patterns of use at specific locations. However, they are still limited once the focus switches to individuals where the aim is to collect information about their daily journeys in larger spaces. Spek (2009) shows, when tracking pedestrians in Norwich, Rouen and Koblenz, the ability of GPS tracking to produce a map that aggregates individuals’ walking behaviours. He uses car parks as a place to target city centre visitors and to distribute the GPS devices in order to track their movements during their visit. This technology gives the researcher access to a set of accurate data in terms of the time of day of each route, time spent at specific locations, destinations and the type of transport mode (Verbree et al. 2005; Spek 2006, 2008, 2009; Van Schaick and van der Spek 2008). Distributing GPS devices among participants seems to be quite useful for one day of tracking. However, if the survey is for a longer period, it will require more commitment from participants as they will have to keep charging their devices every night as well as to remember to take the devices with them every time they leave home. Therefore, the participant’s own mobile telephones with an inbuilt GPS were used as a solution to this problem.

The investigation used a combined methodology of both; (1) Quantitative data: including the tracking of participants’ movement in the city via GPS tracks from their mobile phones, and; (2) Qualitative data: focusing on how participants perceive the qualities of the mapped spaces where they walk. The dataset used in this paper is part of a larger research project called Mapping Riyadh in a Human Scale.

**Mapping of movement behaviour**

This stage consists of four steps: (1) Choice of participants was achieved through a presentation to groups of interested young Saudi adults of both genders. Participation in the project was voluntarily (for more information about the selection criteria, see the section entitled, ‘Sample selection’). Each participant had to download a smart phone app, Moves, and through the project’s website, www.slowcity.dk/riyadh, the participants provided information regarding age and gender, while they also gave us access to their tracking data, which was available through the Moves application programming interface (API). This information was stored in an SQLite database on the web application’s server. (2) Tracking process: The Moves app recorded the point location of each participant at a frequency of between 5 s and 1 min depending on the speed of movement and the power of the signal. Using smart phones helped to keep participation at the same level during the data collection process because the application worked in the background. After the initial setup, participation did not require any effort or interaction with the Moves app. (3) Data validation included cleaning,
filtering and categorizing. Geo-data regarding participants' homes were removed from the dataset to maintain anonymity. The attribution of data was based on age, gender, activity, date/time, a unique identification number for each participant and the collection of each participant’s point locations during the study. (4) Collective analysis: the filtered GPS data of each gender were mapped as kernel density surfaces with a convenience buffer of 500 metres in order to identify the top walking areas for each gender. This step also demanded that the typologies of spaces should be categorized along with the patterns of walking activity within these locations. During the mapping process, Quantum GIS software was used to analyze the GPS data.

Map-based workshop

Participants from each gender were targeted as members of a social group and a one-day workshop with each group was held in Riyadh. The aim of the workshops was to gather qualitative data from the participants to help understand the influence of socio-cultural factors on their movement behaviour. The workshops consisted of a set of map-based discussions using visualization materials of data from the GPS findings of both the types of spaces and pattern of walking behaviour. This was conducted to encourage participants to retrospectively reflect on their mobility behaviour and spatial preferences with a focus on how they relate them to the notions of comfort and safety. The data from the map-based workshops were in the form of audio-recorded discussions as well as facilitators’ reflections. The data from the participants’ discussions were inductively coded in order to generate themes that describe how participants reflect on their movement behaviour.

Sample selection, climate and survey duration

As the study focuses on young adults in Riyadh (19 to 24 years old), there was a trade-off in selecting the sample due to the limitations regarding how to obtain access to female participants. Thus, the sample focused on university students and by presenting the research project to them, their voluntary participation was secured. The sample consists of 45 participants (22 males / 23 females) who performed spatial patterns that are widely and geographically distributed across Riyadh. The observations of the participants’ movement took place during a period of six weeks between November and December 2014 in a moderate climate (25°C–15°C); while the map-based workshop took place in April 2015.

Range of walkscapes and patterns of walking

Over the tracking period, the registered GPS tracks represent above 4 million points (Figure 1). Each point is designated to a type of activity such as walking (slow movement), transporting (fast movement) or stationary activities. The city is car-oriented with car trips accounting for approximately 98% of daily commuting journeys. Kung et al. (2014), in their study on commuting trips in Riyadh, found that the average morning commute was between 50 to 65 min, a total which can be doubled once the afternoon and evening trips are considered. The tracking data show that among all participants walking is hardly practised in daily life. On average, 12 min per day are spent walking. Men's general mobility in the city is less restricted than women’s, but the amount of time they spend walking on average per
day is about the same. However, the distinction between men and women is found in both the typology of spaces, where walking has been conducted and in the patterns of walking that each gender generates in the space. The identification of the spaces was made through a series of ‘heat maps’ showing the intensity of walking activity within a geographic location. Here intensity represents the accumulation of time spent walking in the space over the tracking period. The locations where walking was conducted by both genders during weekdays and weekends show a diversity of space typologies: (1) Educational Spaces: the university campuses are where most of the walking activities during the weekdays were conducted by both genders as all participants are students. (2) Gated Communities: these environments are semi-public as not everyone is permitted access. (3) Urban Streets: mainly male participants walked in this typology of space. The tracking shows that 59% of the male participants and 8% of female participants walked in urban streets. (4) Neighbourhood Mosques: attending a mosque is basically a male practice and entails walking from home to the mosque during prayer times every day. (5) Shopping Malls: these are indoor environments which are dominated by female participants, with 57% of the female participants being tracked walking in
this typology of space, while no men were registered. (6) **Parks:** although they are always busy with families and children, the tracking results show a low intensity of walking among participants: 4% of men and 8% of women. (7) **Indoor Sport Facilities:** this space typology was used by 4% of male participants for walking.

**Figure 2.** Two heat maps showing the clustering of walking activity in the city during weekdays; (a) young women and (b) young men.

**Figure 3.** A heat map and a table showing areas in the city where walking was mapped among young women during weekends.
By exploring the gender differences of the spaces where walking was conducted during both weekdays and weekends, the tracking results show a city with a collection of gender-specific walkscapes (Figure 2). The geo-clustering of walking activities shows a clear distinction between the typologies of spaces that accommodate walking for each gender. For example, women walk in semi-public spaces such as indoor environments and gated communities, while men prefer urban streets and commercial areas. Figure 4 presents a heat map and a table showing areas in the city where walking was mapped among young men during weekends.

Figure 5. A map of Al Tahlia Street, an urban commercial street, showing the areas of promenading activities of male participants (red colour) and the clustering of the women’s walking which is concentrated in indoor environments (black colour).

By exploring the gender differences of the spaces where walking was conducted during both weekdays and weekends, the tracking results show a city with a collection of gender-specific walkscapes (Figure 2). The geo-clustering of walking activities shows a clear distinction between the typologies of spaces that accommodate walking for each gender. For example, women walk in semi-public spaces such as indoor environments and gated communities.
communities (Figure 3), while men mostly walk in urban environments (Figure 4). Even though the survey was conducted in a period with a moderate climate, the findings show that at the weekends, women mostly walked in shopping malls.

In addition to the identification of space typologies where walking activities were conducted, this paper also investigates the patterns of walking that take place in urban spaces. The results identify two types of patterns of walking in urban streets: (1) Promenading: a continuous walking activity within the space, and; (2) A to B movement: either from a car to a destination or from a place to another place. While 40% of men who visit urban streets tend to promenade, only 4% of women promenaded on this typology of space, while the remainder of the women who were tracked were registered as A to B movement, e.g. directly from cars to shops, while more leisurely walking was conducted in indoor spaces (Figure 5).

The meaning of walkscapes

In the following sub-sections, this paper presents, interprets and discusses data from the mapping of walking activities and the map-based workshops and examines them through gender clustering and space typology. The discussion aims to explore the socially produced meaning of walkscapes based on the findings from the GPS mapping, participants’ discussions and researcher reflections to contextualize it with the theoretical approach previously presented in this paper.

Gendered city: segregation in motion

The tracking results of walking activities during both weekdays and weekends reveal a map of Riyadh with a collection of clusters that occur on the basis of gender. The accumulation of spaces where each participant was tracked walking divides the city walkscapes into female space and male space (Figure 2). In the workshops the participants reflected on their movement behaviour in relation to the city walkways as spaces for walking through group discussions which aimed to explore how this dynamic works.

Basically, young guys in Riyadh, in general, go to places where they can interact with girls and especially to places where the religious police are not so strict; guys in Riyadh like to show off … In winter, for example, guys go to camping places in the desert ‘mukhayamat’; there they drive their fancy cars in a specific area where most of the winter activities are located in order to show off in front of the girls. (Men’s discussion, Group 3)

The best promenade in Riyadh is King Abdullah walkway, you see girls walking and taking photos … But in Al Tahlia Street, I cannot walk there; the outdoor seating is full of guys … They keep looking at you and talking to you; they do not respect you at all … Al Tahlia Street is full of activities and shops; it has a great atmosphere, but I think it is only for men; actually it is not, but I do not think guys are educated enough to accept seeing a woman walking alone on the street. (Women’s discussion, Group 4)

Note: Al Tahlia Street and King Abdullah walkway are two popular walkways in the city; participants kept referring to them as both of the streets established a mental image of the modern urban space in Riyadh.

Gender segregation is enforced in city life by government legislation, influenced by socio-cultural norms and the physical settings of the urban form, and it is also apparent in motion. The dominant use of private cars in Riyadh helps to strengthen the segregation of
men and women. People in this mobility culture will not encounter ‘others’ during the daily trip; cars provide an extension of the gendered space, which isolate men and women from the public space. Therefore, in this context, walking in urban spaces is also a way of confronting social and gender norms. Young men, for example, seem to conceive city spaces as places where they can circumvent the gender segregation and encounter the opposite sex. They show a strong awareness of the areas around the city where more tolerance is shown and where the level of restrictions is lower. During the discussion, they were able to identify, spatially and temporally, urban spaces where there was greater potential for gender interaction. It seems as if the young men are developing a unique mental map that allows them to navigate areas in the city where social and gender restrictions can be transgressed or avoided. Women, on the other hand, are not only aware of these areas in the city, but also have the ability to self-regulate their spatiotemporal presence in urban spaces to avoid unwanted encounters. Such a tactic of avoidance is also used by women in other global south cities (Sur 2014; Khalili 2016). The awareness of young women and men about the locations where they can interact with the opposite gender highlights the importance of urban spaces where gender intersectionality, co-presence, occurs in the city as potential sites for gender restrictions to be reproduced or contested. According to both of the discussions among the male participants and the women’s experience-based reflections in the workshop, the interactions take place in the following ways: (1) Co-presence: just being in a space that contains both genders; this does not include any sort of intended act to make contact with the people present, but simply refers to the pleasure derived from being in a collective space. (2) Active interaction: this includes visual or verbal contact with the opposite gender, which some young women interpret to be ‘uncontrolled’ or ‘misbehaviour’ and which, therefore, contributes to women’s self-regulated use of urban spaces.

Although this study only covers young adults, it still highlights how the practice of walking is being influenced by people’s perception of city walkscapes which, in this study, seems to be socio-culturally constructed. Women’s walkscapes have become limited as their use and access to urban spaces has likewise become spatially and temporally self-regulated and bounded by gender norms and traditions. Such a situation has reduced the opportunities for men and women to be co-present in urban spaces, which leads to the masculinization of these spaces. Consequently, as the tracking survey shows, the majority of young women use ‘privatized’ public spaces such as shopping malls and gated communities as spaces for walking, especially at night. Thus, the question is: why are ‘privatized’ public spaces meaningful walkscapes for women in Riyadh?

**Shopping malls and gated communities as urban shelters for women**

Young women’s walking activities mostly take place in indoor environments and gated communities. In this study, 57% of the walking performed by women was tracked in shopping malls (Figure 3), while no men were registered walking in this space typology (Figure 4). Participants of both genders were asked to reflect on these environments as spaces for walking in order to understand the physical and non-physical qualities of these space typologies:

I walk in shopping malls because it is safe; no one bothers me and I can walk at any time also in summer ... If someone bothered me, I’d just say to them that I will call the security; and they’d go away. (Women’s discussion, Group 1)
For example, let us say there are two shops in the same place, but one of them is inside the shopping mall and the other outside, which one would you choose to go to? Simply the one outside of the shopping mall because the other one will be very much controlled by religious police and that creates many problems which I do not want to be involved in. (Men’s discussion, Group 3)

There is an interesting setting which is the Diplomatic Quarter in Riyadh; it is something different to the rest of the city ... we can walk with or without Abayas because it is a mixture of different cultures [Saudis and Internationals]. (Women’s discussion, Group2)

Note: Abaya is an outer dress worn over street clothes by women when being out in public spaces.

In the workshop, women described shopping malls as spaces, not only for commercial activities but also for meeting and hanging-out with other female friends as well as for walking. In Riyadh, a large number of shopping malls do not allow single men to enter during the afternoons and evenings, which shows how gender challenge not only affects women’s mobility but also limits men from accessing certain spaces. Shopping malls are also provided with security and surveillance systems that increase the sense of safety for women. These factors contribute to redefining the sense of ownership of space as to be for women only. During the discussions, female participants did not refer to religious police as a sign of safety, but rather to the presence of other women and to the security staff members in the space. In addition, shopping malls provide artificially controlled environmental micro-climates through air conditioning and lighting, which increases the level of comfort for women, especially in summer, as women are not allowed to be in public without Abaya. Furthermore, participants mentioned gated communities as suitable environments for walking; this space typology represents a unique condition as it is not accessible to everyone in the city. Shopping malls and other ‘privatized’ public spaces are considered to be less masculine (Jin and Whitson 2014; Sur 2014; Khalili 2016), which illustrates the crucial correlation between a low feeling of safety among women and spaces that are dominated by men. Acknowledging the impact of the quality of physical elements of urban spaces, women’s presence in urban spaces in Riyadh seems to be derived from how culturally ‘appropriate’ it is to be visible in the space. For example, in Saudi culture, shopping malls are considered to be socially ‘appropriate’ spaces for women. Regardless of the safety and micro-climate issues, the social acceptance of shopping malls highlights the importance of ‘shopping’ as more than just an urban activity; in fact, it provides a justified reason for Saudi women to be outside their homes. Le Renard (2013) identified the range of spaces that are available for women in Riyadh as shopping malls, theme parks, work environments, religious spaces and educational institutes. These spaces are acceptable for women to use because they imply a purposeful presence, a justified reason to be visible. Therefore, shopping malls are considered as meaningful walkscapes by young women because they offer such a justification, and they therefore become ‘urban shelters’ for shopping, walking and social activities. Whitzman (2013) highlights the importance of women’s motivation to negotiate their presence in urban spaces. Therefore, it becomes relevant to explore how women in Riyadh regulate and justify their presence in urban spaces, the types of gendered behaviour women encounter, and what tactics they use to avoid unpleasant encounters.
Street promenading vs. street fears

While one of the major goals of the city urban campaign is to promote urban activities such as promenading in city life, the GPS tracking results show that only 4% of female participants were tracked promenading on urban streets during the whole period of the survey. On the other hand, 59% of male participants engaged in walking on Al Tahlia Street, while 40% engaged in promenading. Even though 48% of female participants visited Al Tahlia Street, their walking patterns were limited to walking from the car to the shop (Figure 5). In the workshops, participants were asked to reflect on promenading as an urban activity in public urban spaces in Riyadh:

I think sometimes people make you not want to walk in streets. For example, when I walk in Al Tahlia Street and lots of people stare at me as if I'm an alien ... They give you a look as if you are cheap and crossing the social boundaries ... It is very hard to walk especially at night ... That's why my parents do not let me go to any crowded promenade ... it is not comfortable and I have to ask my driver to follow me or wait for me. (Women's discussion, Group 1)

I walk in King Abdullah walkway. It is always lively and I see so many women walking; I feel safe ... I like it also when there are some events like the national day or the spring festival. (Women's discussion, Group 4)

Here in Riyadh, wherever there are women in the space, the problems start; and when the religious police arrive, you as a guy will be in trouble because the religious police do not talk to girls ... I think the presence of the religious police in any space does not make me feel comfortable. (Men's discussion, Group 3)

One major concern that emerged among young women when they talked about promenading as a walking practice in urban spaces is who they will encounter in the space. This crucial concern is one of the factors that can affect the opportunities for women to be present in urban spaces spatially as well as temporally. Le Renard (2013) states that young men are the reason for the lack of safety among women in Riyadh. Consequently, some women strategically plan their trips in the city to avoid these encounters. Similar to the findings in Sur's study (2014) on the city of Kolkata, this study shows that avoidance is one of the main self-regulating tactics used by women in Riyadh. Even though the GPS tracking shows clusters of walking practices that occur geographically across the city, the map-based discussions with female participants show another form of clustering that happens while they walk in the space such as choosing spaces and times when the presence of women is relatively high. This shows how the presence of other women in the space contributes to the feeling of safety, which Valentine (2001) describes as an external regulator of public behaviour that also motivates women to actively use the space. Female participants also highlight the annual events that take place in urban spaces as suitable times to be visible in the space, something which is also socially accepted. During the discussions, both male and female participants positively acknowledged the influence of some physical elements such as the width of the sidewalk, tree canopy, street furniture, as well as types of space programming and shops. However, the impact of socio-cultural aspects on the use of urban streets was very significant in terms of how the participants practise walking and perceive walkscapes. Urban streets are the only platform where men and women can be co-present in city life, which can lead to a wide spectrum of unexpected gendered encounters. Studies by Koskela (1997) and Sur (2014) show that unfamiliar behaviours and environments are generally considered risky among women. Since streets, in this context, are socially perceived as places for men, the
The presence of women is contested mostly through visual harassment. In addition, women might also be seen as ‘disreputable’ and blamed for any victimization that occurs on the street. Even if legislation does not explicitly restrict women from using and accessing urban streets, the experienced gendered encounters as well as the social stigmatization of women as being in the ‘wrong place’ at the ‘wrong time’ constitutes a temporal and spatial limitation that regulates women’s use and access to urban streets. The case of Riyadh provides an insight into how socio-cultural aspects led to spatial exclusion, which affects women and limits their participation in the life of the city.

On the other hand, promenading as a walking practice provides another dimension of experience for young men. Besides the benefits of exploring the city, having a good time and exercising (Knox 2005; Wunderlich 2008), this study shows how it somehow legitimizes the interactions between men and women. As sidewalks to some degree function as mixed-gender spaces among all the gendered spaces in the city, there are more opportunities for men and women to be co-present in the space, which takes the form of walking. According to the men’s discussions, this is a main reason why some young men walk in certain spaces in the city. Social norms as well as religious restrictions limit direct contact between the genders even in open spaces, yet being in motion opens up avenues for visual and verbal interaction. This situation is the only urban window for interaction between men and women and, therefore, young men’s behaviour varies and in some cases takes the form of either flirting or verbal harassment. Viswanath (2013) and Valentine (2001) describe these everyday incidents as minor forms of harassment in public spaces, but that they make a significant contribution to the withdrawal of women. Even if sidewalks offer a platform for men and women to be co-present in the city, the socio-cultural bounds and the gendered behaviour that women encounter make sidewalks contested spaces on which the presence of women is spatially and temporally challenged.

This paper shows how walking experience, tempo-rhythm, sense of place and range of walkscapes are not only determined by the physical setting of space. The influence of socio-cultural aspects on the spatiotemporal practice of walking shows how social norms and traditions are encountered through walking. For example, women’s need for ‘urban shelter’ to socially justify their presence in the space has an impact on their feeling of safety and comfort. Therefore, in addition to Whitzman’s argument (2013) in which the motivation of women to negotiate their presence in urban spaces plays a key role in the inclusiveness of space, the design of urban spaces should provide appropriate ‘shelters’ that encourage women to claim their role in the space.

Conclusion

Walking is an important tool for perceiving the city. The social, cultural and physical aspects of walking illustrate the meaning of walkscapes. This paper has provided insights into the influence of socio-cultural aspects on the practice of walking and the meaning of walkscapes by investigating what type of urban spaces people walk in, what patterns of walking they produce, and how the range and meaning of city walkscapes are influenced by social norms and cultural relations. Tracking people’s movement through smart phones using the Global Positioning System (GPS) technology creates a rich dataset, while it also requires less commitment from participants, which means the tracking period can be longer. Using the
visualization materials of the tracking data to facilitate discussions with the participants helps to reveal the embedded meaning of walking, and how it is practised both individually and socially.

Walking in urban spaces in Riyadh is more than a mode of movement; it is also a way to encounter, reproduce and negotiate social norms. The mapping of young people’s movement reveals that men and women's access to the city’s walkscapes is bounded by gender norms and traditions. Even though the tracking during weekdays and weekends shows a diverse range of walkscapes — educational spaces, gated communities, urban streets, shopping malls, parks, indoor sport facilities and around neighbourhood mosques — mapping walking practices revealed a city with a collection of gender-specific walkscapes. Women tend to walk in ‘privatized’ public spaces such as shopping malls. In Saudi culture, ‘shopping’ is more than an urban activity; it justifies women’s presence in the space, and it is a socially accepted reason for women to be out of their homes. Therefore, shopping malls become ‘urban shelters’ that justify women’s presence, which gives them a feeling of safety so they use such spaces for walking. Against the background of widespread gender segregation in city life, urban streets provide a platform where men and women can be co-present. Therefore, in this study, walking has been shown to be a way for young men to interact with women in motion. Consequently, women self-regulate their spatiotemporal presence in urban spaces to avoid unpleasant gendered encounters. In addition, streets and sidewalks are socially conceived as men’s walkscapes, which contributes to women’s withdrawal as they might be stigmatized and blamed for any harassment that occurs in the space. In spite of the impact of the physical qualities of walkways, this paper shows how socio-cultural aspects have a significant influence on the practice of walking and the meaning of walkscapes. In Riyadh, young men and women practise walking in different walkscapes because they have different needs in the space. This shows that the ‘universal’ spatial qualities should be supplemented by knowledge of social-cultural norms in order to provide meaningful walkscapes, where men and women can be co-present in the space in culturally complex contexts.

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