



# The Urban Soundscapes of a Studentified Neighbourhood in the City of Tshwane, South Africa

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## Abstract

Urban environments produce distinctive and diverse soundscapes. The challenge of noise in particular impacts city dwellers and urban livability. There is an abundance of research focused on noise pollution with a limited but growing research interest in urban soundscapes. Few studies, however, explore the unique soundscapes and challenges of noise in neighbourhoods that have undergone studentification. Indeed, the development of student housing, the concentration of a student population, and the clustering of activities related to spaces of student consumption produce unique and often polluted soundscapes. Using three ethnographic soundwalks and a survey with students from the University of Pretoria, this paper explores the soundscapes of Hatfield, a neighbourhood that has undergone studentification. This paper seeks to understand the challenges related to urban noise and how this impacts students. It was found that noise has unique spatio-temporal characteristics impacting student's ability to manage noise. Indeed, noise emanating from traffic and entertainment establishments is perceived to be the most disruptive. It is recommended that urban planners, property developers, architects, and urban managers need to be aware of the unique and often polluted soundscapes that are associated with a studentified neighbourhood. This awareness could inform better urban planning, architectural and urban design, and policies on the management of noise levels within these types of neighbourhoods.

**Keywords** Soundscapes · Urban noise · Noise pollution · Studentification

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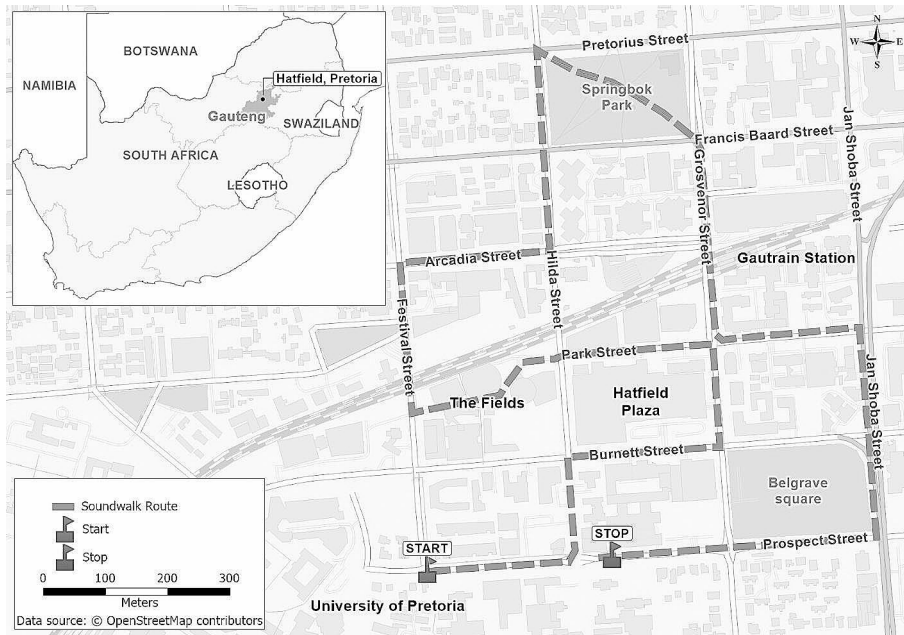
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## Introduction

The visual sense is often prioritised in the experience of place. When we think of a city, we perhaps visualise what it looks like, often forgetting senses, such as sound and smell (Pocock, 1993; Tuan, 1977; Wissmann, 2014). Indeed, other senses are often neglected when forming a sense of place (Revill, 2014; Tuan, 1977). For Wissmann (2014) sound contributes to how the city is perceived, experienced, and appreciated by its users. Atkinson (2007, p. 1905) explains; “the ambient soundscape of the street is made up of a shifting aural terrain, a resonant metropolitan fabric, which may exclude or subtly guide us in our experience of the city”. Soundscapes offer insight into how humans produce, interact and are affected by sound in their environment (Schafer, 1977). This paper aims to explore the varied urban soundscapes of Hatfield in the City of Tshwane, a neighbourhood that has undergone studentification. In addition, students’ perception of sound and strategies for dealing with noise is unpacked. The findings of this paper draw on ethnographic soundwalks and a survey of students from the University of Pretoria.

Three soundwalks were conducted to understand the soundscape of Hatfield. Walking is often neglected as a method of observation in cities. Indeed, it enables an embodied knowledge and experience of the city and allows the researcher to participate in the spatiality and temporal rhythms of everyday life (Lefebvre, 2004; Pierce & Lawhon, 2015). This is an appropriate method of observation in the context of an African city, where so much of urban life occurs on streets and public spaces. The soundwalk is a method of observation that requires the researcher to walk quietly along a predetermined route and to actively listen to the acoustic environment. Researchers can be equipped with a recording device, and cameras to photograph or take videos of activities associated with certain sounds, in addition, field notes can be taken to document acoustic observations (Gallagher & Prior, 2014). In this research, soundwalks were useful in determining the spatiotemporal sound changes in Hatfield. Three soundwalks were conducted and followed the same route on different days of the week and at different times of the day. The first soundwalk was conducted on Monday 20 June 2022 from 07:00 am to 08:00 am. The second was from 11:30 am to 12:45 pm on Wednesday 22 June 2022 and the third soundwalk was from 16:30 pm to 17:45 pm on Friday 24 June 2022. The selection of these specific days and times aimed to capture how the usage of these spaces might differ throughout the week and at different times of the day, thereby impacting the surrounding soundscape. The route was 4 km starting from the University of Pretoria’s Prospect Street gate and criss-crossed through the centre of Hatfield back to the starting point. This specific route was selected to include parts of Hatfield that were busier with restaurants, bars and shops, as well as parts that were quieter, more residential and contained green space to appreciate the varied soundscape of Hatfield. A combination of digital sound recordings, active listening and field notes were used to help observe, understand, and identify recurring rhythms and patterns of sound. Refer to Fig. 1 for a map of the study site and route of the soundwalk.

In addition, an online survey was conducted with 178 students from the University of Pretoria to gain a broader understanding of the perception of sound in Hatfield. The survey specifically targeted students of the University of Pretoria who currently



**Fig. 1** Soundwalk route in Hatfield, City of Tshwane (Source: Author)

reside in Hatfield. The survey was designed using Google Forms and a link was distributed through various online platforms such as the university’s learning management system ClickUp, WhatsApp Groups, as well as various Facebook and Instagram pages. Ethics clearance and permission from the registrar’s office were obtained to conduct the research involving students. The survey link was open for August 2022 and 178 usable responses were recorded.

## Urban Soundscapes

The concept of soundscape was first introduced by Southworth (1969) who explored the sonic environment of Boston in the United States of America. Southworth (1969, p. 49) explained that “today’s city dweller is bombarded by a continuous stream of invisible but highly attention-demanding sounds, smells, and micro-climates”. The Canadian composer, Murray Schafer, however, popularised the concept of soundscape in the 1970s and initiated the “World Soundscapes Project”, documenting both urban and rural sounds, and exploring the relationship between humans and the sonic environment (Schafer, 1977). The concept has evolved since the 1970s and has seen sustained research interest from a variety of disciplines including music, acoustics, architecture, environmental health, psychology, anthropology, sociology, and particularly in urban studies (Arquette, 2004; Atkinson, 2007; Kang et al., 2016; Samuels et al., 2010). Therefore, there is no universal definition for this concept. Liu et al. (2013) define a soundscape as the total sounds in a particular environment reaching the human ear. Davies et al. (2013, p. 225), however, provide a broad definition

of a soundscape as “the totality of all sounds within a location with an emphasis on the relationship between individual’s or society’s perception of, understanding of and interaction with the sonic environment.” For Engel et al. (2018) soundscapes underscore the interaction between sound and space. Oldoni et al. (2015) explain that soundscapes cannot be detected without the ear, particularly the human ear, making the perception of humans important in understanding soundscapes.

Soundscapes, and specifically urban soundscapes have transformed and expanded rapidly since the dawn of the industrial revolution in the late 18th century (Picker, 2003). Indeed, widespread innovation in new technologies and transportation has produced new sounds and widely contributed to noise pollution in cities (Picker, 2003). The sounds that contribute to a soundscape are diverse and varied. Certain sounds have become so loud and recurring that they are referred to as ‘polluted soundscapes’, or simply perceived as noise pollution (Schafer, 1977; Wissmann, 2014). The challenge of noise pollution has become characteristic of the contemporary urban environment (Raimbault & Dubois, 2005). Noise has been declared and recognised as a pollutant since 1972 by the World Health Organisation (de Paiva Vianna et al., 2015). The widespread impact of noise pollution is widely recognised in medical and healthcare literature but also studied in various other disciplines (Goines & Hagler, 2007). Indeed, among other impacts, noise can affect interference with spoken communication, stress, sleep disturbance, cardiovascular disturbance, hypertension, disturbance in mental health, reduced task performance, negative social behaviour, and annoyance, and in serious cases can lead to hearing impairment (Goines & Hagler, 2007). Excessive noise pollution can also have economic consequences, such as reduced property values and decreased productivity in places of work and study (Obi et al., 2021).

The urban soundscape is composed of different types of sound. Therefore, it is important to understand the different categories or sources of sound. Davies et al. (2013) differentiate natural, human, and mechanical sounds. Pijanowski et al. (2011), however, details three major sources of sound. First, biophony are produced by all living organisms. Second, geophony are produced by natural elements such as thunder and rain. Third, anthrophony includes sounds produced by humans; these would also include artificial or mechanical sounds. Urban areas are predominantly characterised by anthrophony - with road traffic noise considered to be the main source of noise pollution (Thompson et al., 2022).

Sound can also be categorised according to occurrence, intensity, and frequency and is measured in decibels. According to Schafer (1977), soundscapes are composed of keynote sounds, sound signals, and sound markers. Keynote sounds are in the background, they are continuous and consistent and have become part of our lives and we do not even notice these sounds unless careful listening takes place. The sound of birdsong in a forest is an example of a background sound. Sound signals are the loud sounds in the foreground that attract attention such as shouting or a car horn. Sound markers, however, are sounds that make a particular space unique or contribute to a sense of place, for example, the horns of a boat and the call of seagulls in a harbour town (Birdsall & Drozdowski, 2018; Schafer, 1977).

In addition, certain sounds and specifically music play an important role in how places are experienced and can offer a sense of belonging (Smith, 1997). Duffy et al.

(2007), explain that sound and music are significant place-based resources in developing both self and group identities because their understanding is rooted in the context of where they are heard. Music and sound manifest when the individual involved reacts, for example, a person who dances in response to music shows their emotional and physical reaction to the music and in turn also place. Sound and music can trigger memories and certain emotions embedded within a particular landscape (Duffy et al., 2007). Indeed, certain music genres have significantly shaped the outlook of cities such as New Orleans, Nashville, and Detroit thus contributing to a unique sense of place (Wissmann, 2014).

Limited research explores the role of sound in forming a sense of place in the African context. For Rapoo (2013) a defining feature of urban soundscapes in African cities is the prevalence of informal activities that contribute to the sonic environment. For example, street vendors, informal markets, and informal transportation systems are common sources of sound in many African cities. Indeed, these activities contribute to “a cacophony of sounds [that] fills up the African city space... all shaping, competing and claiming access to the city” (Rapoo, 2013, p. 370). The negative impacts of high levels of noise pollution in African cities, however, have received some scholarly attention, most notably in Nigeria (Oyedepo & Saadu, 2009; Olayinka, 2012). Rapid urbanisation across Africa has seen the construction of infrastructure and new buildings, as well as increased traffic congestion that contributes to urban noise (Rapoo, 2013). Limited research has explored geographies of sound or urban soundscapes in South Africa.

During apartheid South Africa, Hart and Pirie (1984, p. 38) and Hart (1988) acknowledged certain genres of music such as jazz as an important contributor to the “sight and soul” of densely populated slum neighbourhoods such as District Six in Cape Town and Sophiatown in Johannesburg. In post-apartheid South Africa, Livermon (2008, p. 271) explores the role of sound in Johannesburg;

“I have been struck by the extent to which the feel of the city is reflected in its sound. The mixture of different African and European languages, the loud clap of thunder on a summer day, the clicking of shoes on the pavement, the incessant honking of minibus taxis, the pounding beats coming out of corner stores, the noisy birds that populate the trees in one of the largest man made forests in the world - all of these incessant sounds stimulate my senses”.

Livermon (2008) details the emergence of Kwaito music in post-apartheid Johannesburg as a defining music genre blurring the lines between the streets of the township and the inner-city. In addition, Livermon (2008) explores the importance of the car for both the private and collective consumption of music. It is common for people to gather around a car in public areas, socialising while listening to music. Gregory and Rogerson (2019b) identified this phenomenon in Braamfontein, an urban neighbourhood in Johannesburg that has experienced studentification and has a vibrant night-time economy. Car boot parties have become a common feature on the streets of Braamfontein during evenings and specifically over the weekends. Both Livermon (2008); Gregory and Rogerson (2019b) observed the role of the night-time economy

and a lively party scene in areas such as Melville, Soweto, and Braamfontein contributing to the overall soundscape of Johannesburg.

## Students, Studentification and Noise

Higher education institutions and students play an important role in the urban economy and contribute to the vibrancy of cities (Harris & Holley, 2016). Existing literature, however, tends to focus on the urban challenges and negative impacts associated with student geographies (Holton & Riley, 2013; Hubbard, 2008; Moos et al., 2019). The urban process of studentification sees the transformation of traditional residential or commercial areas into predominantly student-occupied neighbourhoods (Smith, 2005, 2008). The concentration of a student population into specific areas contributes to distinctive spaces for student housing, leisure, entertainment, and shopping (Thomsen & Eikemo, 2010). Amongst several impacts, noise has become a recurring theme of discussion that is associated with studentification (Sage et al., 2013).

For Sage et al. (2013) the spatio-temporality of students at night time and over weekends affects the rhythm of a neighbourhood. Indeed, students' use of space and time might not be in line with non-student residents, therefore issues surrounding noise can become a challenge (Chatterton, 1999; Smith, 2008). The party culture amongst students and the emergence of a night-time economy in many student districts has led to challenges of anti-social behaviour and high levels of noise nuisance (Chatterton, 1999; van Liempt et al., 2015; Woldoff & Weiss, 2018). For Smith and Holt (2007) noise can come from student accommodations, pedestrians, night-time establishments, and increased traffic from private vehicles and taxis. van Liempt et al. (2015) specifically underscores the emergence of the night-time economy that can spark conflict over noise levels, as well as other anti-social behaviours such as alcohol and drug abuse, vomiting and public urination, vandalism, and crime in many cities. For Sage et al. (2012a, 2012b) noise nuisance could affect the quality of life in these neighbourhoods. Sage et al. (2013) argue that noise, therefore, becomes a contentious issue in student neighbourhoods, contributing to the conflict between students and non-student neighbours. Sage et al. (2013) explain that noise nuisance is more pronounced in areas with a high number of housing in multiple occupation and affects non-student residents who live alongside students. Purpose-built student accommodation, however, tends to be separated and concentrated away from residential areas, therefore mitigating some of the negative impacts associated with studentification (Smith & Hubbard, 2014). Gregory and Rogerson (2019a) found that in extreme cases of noise nuisance and subsequent conflict, it could contribute to displacement pressure amongst long-term and non-student residents. Overall, Woldoff and Weiss (2018) argue that anti-social behaviour and noise nuisance contribute to neighbourhood disorder. Smith (2008), however, underscores it is important not to demonise students as perpetrators of anti-social behaviour and noise nuisance, but that it also affects students negatively contributing to challenges of urban liveability.

The past decade has seen growing research interest in studentification in South Africa. Several case studies recognise anti-social behaviour and noise as a negative impact associated with studentification in Stellenbosch and Bloemfontein (Acker-

mann & Visser, 2016; Donaldson et al., 2014; Gbadegesin et al., 2021; Visser & Kisting, 2019), as well as in Johannesburg (Gregory & Rogerson, 2019a, 2019b). This paper departs from the common narrative of students as perpetrators of noise but rather explores the perception and diversity of sound in a neighbourhood that has undergone studentification.

## The Soundscapes of Hatfield

Hatfield is an urban neighbourhood that has experienced a significant change from a residential to a much higher density mixed-use residential and commercial area that has undergone studentification (Horn, 2021). Located about 5 km East of the central business district of Pretoria, the area is home to the University of Pretoria's main campus. The University of Pretoria is one of the largest contact and residential universities in South Africa, with around 55, 000 students spread across seven campuses. The majority of these students, close to 32, 000 are contact students at the Hatfield campus (University of Pretoria, 2024). Most of the university supplied housing is located in Hatfield and surrounding suburbs. Since the massification of higher education in the early 2000s, the area has seen increased private investment in the development of higher density purpose-built student accommodation in the centre of Hatfield. The eastern parts of the suburb are still characterised by low-density single-family dwellings that have mostly been converted into student communes. Several major modes of transportation converge in Hatfield. The Gautrain Rapid Rail Transit system links Hatfield with Johannesburg and the O.R. Tambo International Airport. In addition, the A Re Yeng Bus Rapid Transit System, as well as several other bus and taxi services, a metro rail system, and several major thoroughfares for private vehicles makes Hatfield an important node for commuters and property investment (Horn, 2021). Pretoria is the administrative capital of South Africa, therefore there are several government departments and embassies located in Hatfield. At the centre of Hatfield is a commercial zone with spaces for retail and entertainment which largely cater to the majority student population. In recent decades Hatfield has evolved into an important student district, with spaces for student accommodation, retail, and entertainment. .

It is important to note that the soundscapes encountered in Hatfield are not unique to the neighbourhood. It does provide a sound bite that will be comparable to several urban neighbourhoods across South Africa. We argue, however, that certain sounds are perhaps more pronounced or associated with a neighbourhood that has undergone studentification. Unlike much of the studentification literature, we do not look at sound as purely disruptive or negative, but rather as part of the urban experience and something that is highly perceptible.

Three soundwalks were conducted on different days of the week and at different times of the day to appreciate the spatiotemporal changes of sound in Hatfield. Overall, in line with the literature on urban soundscapes it was observed that anthrophony dominates the soundscape of Hatfield, there was however also evidence of biophony and geophony. Attention now shifts to provide a nuanced ethnographic account of sound in Hatfield.



### **Monday Morning 07:00 am to 08:00 am**

It was a crisp cold winter morning but the sidewalks of Hatfield were animated through the movement of students and other pedestrians - we could hear their footsteps, engagement in conversation, shouting, and laughter. As we made our way along Prospect Street we suddenly heard the sound of people chanting in the distance - could this be some religious gathering or protest action? An informal recycler pushed his trolley down the road, the trolley clanged as he moved through the space. The morning walk was often punctuated by the presence of cleaners sweeping, security guards communicating via radio, and security gates opening – signalling the start of a new business day. The sound of music was slowly starting to emanate from formal and informal traders. Music blasting from some private vehicles, either parked or as they move through traffic was also observed. The sound of traffic and hooting taxis became deafening in certain parts of Hatfield during peak hour traffic, especially along the main thoroughfares. In contrast, in the quieter parts of Hatfield, such as Springbok Park and along Jacaranda tree-lined streets one managed to observe the sound of birdlife. It was incredibly windy, with strong gusts of wind causing gates to rattle as well as rustling leaves, and creaking trees. Indeed, tree life and green spaces offer important spaces for the absorption of anthropony.

### **Wednesday Lunchtime 11:30 am to 12:45 pm**

The soundscape of Hatfield reached its crescendo on Burnett Street. It is one of the main commercial streets, lined with various purpose-built student accommodations, various shops, a shopping mall, fast food outlets, and several bars. A cacophony of sounds filled the air. The street and fast food outlets were abuzz with people and filled with mini-bus taxis eagerly awaiting commuters. A defining sound of hooting taxis emerged as the drivers were trying to grab the attention of potential commuters and taxi marshals whistled and shouted “*tjommie, tjommie*” (my friend, my friend) along with the destination of the taxi... “*Marabastad!*”. People were in conversation with each other, or on their mobile phones. Some people have retreated into a personal soundscape with headphones on - perhaps in an attempt to block out the urban symphony at play. Music was emanating from fast food outlets, and bars, to grab the attention of passers-by and potential customers. A busker performed on his guitar, trying to catch the attention of pedestrians for possible tips. Car guards were whistling and shouting commands as they directed motorists in and out of parking bays, also eagerly awaiting a tip. The Fields Centre, a mixed-used development consisting of purpose-built student accommodation, as well as some retail and fast food outlets and a gym offered some respite from the cacophony of sounds on Burnett Street. This development is characterised by a series of arcades and piazzas that face inward and away from the surrounding streetscape. At the centre of one of the piazzas a fountain provided white noise, masking the sound of traffic. This observation indicates the importance of urban and architectural design in reducing the sound of traffic.



### **Friday Evening 16:30 pm to 17:45 pm**

During this walk, the monotonous sound of traffic was often pierced by the sound of squeaking brakes, hooting, and the sirens of a police vehicle. The Gautrain buses and trucks along some of the main thoroughfares increased the sound of traffic. The sound of music intensified on Friday. Music was blasting and people engaged in loud conversation and cheering observable from several parked cars on the side of the road. Loud music was also starting to emanate from many of the bars in Hatfield. Overall, a vibrant and cheerful atmosphere was observed, signalling the end of the week. This observation also signals the importance of the night-time economy in Hatfield. Alongside the sound of music and cheerful conversation, the droning sound of diesel generators was lurking in the background. Indeed, during this soundwalk there was load-shedding. South Africa is currently experiencing an energy crisis. Load-shedding is the planned and scheduled power cuts that are implemented by the energy supplier to avoid a total collapse of the energy grid. Many consumers have shifted to generators, solar and alternative forms of power supply when there is a power cut. The sound of generators has become a noisy but all too familiar sound in South Africa to keep the music playing.

### **Students' Perception of Sound and the Impact of Noise in Hatfield**

A survey was conducted with student respondents from the University of Pretoria who reside in Hatfield. A total of 178 students participated in this study. The majority of the respondents were female (65%), African (62%), and undergraduate students (84%) at the University of Pretoria. The survey revealed that 75% of student respondents considered Hatfield a noisy neighbourhood.

The student participants highlighted that the main sources of noise emanate from traffic followed by entertainment establishments. Indeed, several major thoroughfares, as well as different modes of transportation converge in Hatfield. Respondent 13 explains, *"I stay near Lynnwood Road, which is a busy road, so there's a lot of traffic during the day which causes noise."* Respondent 48, a student residing close to the Gautrain station and the shopping mall recounts; *"Firstly, the buses make a lot of noise next to my student accommodation and this is because of the bus stop sign next to the accommodation. Secondly, the taxis at the park corner and trucks that deliver food at Hatfield Plaza also add up to the noise..."* The traffic noise is often punctured by the hooting of minibus taxis and speeding vehicles. Respondent 18 explains *"It's noisy because of the taxi hooting that starts from 4 am until 11 pm, plus the cars that race here, they have loud engines. They race here every day from Monday to Sunday, during the day and in the evening."* Noise emanating from traffic is the most consistent sound in Hatfield, but increases during the morning and evening rush hour traffic. Increased traffic is also noted on weekend evenings, and this is largely linked to the night-time economy.

The sound emanating from entertainment establishments is considered another major source of noise in Hatfield. Due to the large student population, Hatfield and surrounding areas have become an important site for the growth of a night-time econ-

omy. Several entertainment establishments in Hatfield cater to the student market. Some of the student respondents recount their experience with noise emanating from such establishments. Respondent 21 explains; *“it’s noisy because of the many entertainment establishments such as clubs and restaurants.”* Respondent 38 notes that *“the area is extremely noisy because everyday people are partying to loud music.”* Indeed respondent 33 explains that *“...in the evenings, students make a noise leaving and coming back from the club, cars revving, fights and students screaming and shouting and playing loud music outside.”* This signals the spillover effect of the night-time economy, impacting traffic, with speeding cars, loud music, and instances of anti-social behaviour. Noise emanating from entertainment establishments is concentrated in the evenings, most notably from Thursday evening throughout the weekend. Overall, noise related to the night-time economy is most prevalent during the semester and over weekends with periods that are perceived quieter during the holidays.

Some student respondents noted that sound and noise have spatio-temporal characteristics. Indeed, some parts of Hatfield are considered quieter, depending on the location, time of the day, or day of the week. For example, respondent 18 explains *“[It] depends on where and when. Where I live, it is considerably peaceful. But when I visit, for example, Hatfield Studios, it is extremely noisy.”* Similarly, respondent 57 explains the temporal nature of noise in Hatfield, *“only noisy during weekends.”* Indeed, certain hotspots of noise are revealed in the survey results. For the majority of respondents, Burnett Street, as one of the main commercial thoroughfares in Hatfield, is a hotspot for noise and this corresponds with observations made during the soundwalks.

Attention now shifts to discussing the impact of noise on students. The student respondents reacted differently to the varying types of sound or noise in Hatfield. Not surprisingly the majority of respondents indicated that traffic and construction are perceived to be the most annoying sources of noise in Hatfield. In contrast, sounds emanating from nature are favoured by most of the participants. This might be due to the soothing role that sounds from nature play in humans, as it can help promote sleep, improve mood and cognitive performance, and reduce stress (Schafer, 1977). Noise emanating from entertainment establishments, and mechanical sounds such as aircon vents and generators scored high as an annoying sound for some participants. However, for some participants, noise or sound emanating from entertainment establishments adds to the area’s vibrancy and is not considered annoying. Some students indicated that mechanical sounds such as aircon vents as neutral, indicating that these sounds tend to fall into the background and are considered neither favourite nor annoying.

Indeed, noise can have a varied impact on people. Student respondents were asked how noise in Hatfield affects them. For the majority of participants, noise contributes to higher levels of annoyance (81%). 71% of the participants indicated that the noise levels in Hatfield have caused sleep disturbance. Over half of the participants (51%) indicated that noise had led to lower productivity rates. Indeed, lower productivity rates are connected to stress, anxiety, fatigue, headache, and sleep disturbance. Several students recount their experiences. Respondent 46 explains that they experience *“paranoia, I struggle to concentrate while walking due to all the noise. So I just end*

*up rushing from point A to point B, to get out of the area of noise.*" Noise in Hatfield seems to negatively affect the sleep patterns of student residents as the majority of respondents indicated that their sleeping patterns fluctuate and are not consistent throughout the night-time. As explained by respondent 72 *"as a result of sleep deprivation due to the noise I often miss lectures as I will only fall asleep between 05:00 and 05:30 and then sleep through my alarms."*

As indicated earlier, sound is perceptive and what is considered noise for one person, might not be for the next person. Indeed certain types of sound can be annoying to one person but soothing or appealing to the next person. This is reflected by respondent 12 who explains that sound emanating from bars and clubs; *"It activates my FOMO (fear of missing out)."* This respondent has indicated that they feel left out and that there is an urge to be part of the vibrancy outside. Similarly respondent 75 felt; *"jealousy - for example, if people are listening to loud music and they sound like they are having fun, I am jealous that I have to study."*

Some respondents have indicated their frustration with noise emanating from entertainment establishments. Respondent 20 explains they experience *"mood swings when I didn't get a good night's rest from the noise, especially during the weekends."* Respondent 90 has indicated *"It makes me mad sometimes, especially if I need to study, and also demotivates me at times."* Noise emanating from entertainment establishments becomes a problem if it interferes with the studying patterns of students.

The focus will now shift to exploring some of the coping mechanisms that students have employed to manage noise in Hatfield. Most of the participants resorted to closing windows when studying and sleeping to try and block noise from entering their rooms. Rooms with windows facing places of entertainment, or a busy road are more likely to be affected by noise. As indicated by respondent 9; *"closing the window when I want to study, the noise becomes less."* Some student participants indicated that even though they closed their windows, there is still a need to use headphones - respondent 32 explains; *"putting headphones on and playing music to block out the noise."* Indeed, students often resort to personal soundscapes through the use of earphones or headphones because it provides the flexibility of choosing the kind of sounds they would like to hear and block unwanted ones from the surrounding environment. Some have indicated that they listen to natural sounds or white noise to mask the noise coming from outside. For example, respondent 7 explains, *"I listen to soothing sounds so that I'm not aware of surrounding noise."* Some student participants have also indicated that they utilise study areas or the library on campus as spaces that are quiet and conducive to studying.

Urban design and architecture can play a role in how urban noise is perceived, contained, and managed. Indeed 82% of the student participants indicated that architectural design such as wall type and windows play a role in how noise is transmitted into student accommodation. Indeed, the majority of new purpose-built student accommodation would have considered this. Respondent 92 explains that *"most student residences have some sort of noise-resistant windows so the noise is practically manageable"*. This signals the use of double-glazed windows as a design feature to limit urban noise. This links with observations during the soundwalks, the use of fountains, trees and green space, and architectural designs with windows facing inward and away from the street will help manage the impact of urban noise. In

addition, the majority of student residences, both university-owned and private, have strict house rules on noise within the residences. Respondent 103 explains that “*there are protocols and rules in residences with regards to noise and every student in that particular residence has to adhere to the rules, so the noise is mostly managed.*” Apart from managing noise within student accommodation, the City of Tshwane also has a Noise Management Policy (2004) detailing permissible noise levels. As part of by-law enforcement, complaints related to noise nuisance can be directed to the Tshwane Metropolitan Police Department.

## Discussion and Conclusion

The sensory experience of the urban beyond the visual is often neglected. Indeed, senses such as hearing play an important role in how places are perceived and experienced (Tuan, 1977). Harris and Holley (2016) underscore the importance of universities and students contributing to local economies and adding to the vibrancy of cities (Harris & Holley, 2016). This paper aimed to highlight the urban soundscapes that are associated with a neighbourhood in South Africa that has undergone studentification. It was found that the pedestrian nature of the neighbourhood animated the city sidewalks. Both informal and formal economic activities and the rush of people, pedestrians, commuters, and the sounds generated from traffic showcase the continuous movement of the urban system. Indeed, sound or noise is the symptom of the continuous economic and cultural movement of people and those claiming access to and experiencing the city (Rapoo, 2013). Whilst Hatfield offers a sound bite of urban South Africa, for example, the constant hooting of mini-bus taxis and general traffic - we argue some sounds are more prevalent in a studentified neighbourhood. The sound or noise generated by the night-time economy as observed in Hatfield has become synonymous with various studentified neighbourhoods in both the global north (Chatterton, 1999; Sage et al., 2013; van Liempt et al., 2015) and in South Africa (Gregory & Rogerson, 2019a, 2019b). Sage et al. (2013) recognise that students have a unique spatiotemporal rhythm and that their usage of space and time differs from non-student residents. Indeed, this was observed in Hatfield where the spatiotemporal rhythm of students engaging in the night-time economy produces and adds to the soundscape of the neighbourhood. In line with Wissmann’s (2014) observations on urban noise, this study has also shown that sound is incredibly perceptible and what is considered a favourable sound for some, might be considered noise for others. It is important to recognise the diverse and varied soundscapes of the urban, as well as the variety of perceptions and experiences of sound and how it affects urban livability (Schafer, 1977; Wissmann, 2014). Overall the focus of this paper, set in a studentified neighbourhood located in the global south contributes to and diversifies debates related to global urban soundscapes.

Several limitations to this study must be noted. The soundwalks were conducted on specific days and times of the week and during winter. Therefore, the sonic observations cannot be generalised to provide a definitive soundscape of Hatfield. Future research could explore the variations in sound produced in the summer months, other days and times of the week, as well as during the semester and holidays to account

for the varied soundscapes of Hatfield over time. In addition, not all sounds and especially music are easily observed, for example, the subtle presence of headphones and personal soundscapes would limit this. This study was qualitative and exploratory in its approach and future research focused on the more quantitative measurement and mapping of different noise levels are needed. In addition, a focus on policy and by-law enforcement of noise pollution is needed, as well as if noise nuisance contributes to the displacement of students and other stakeholders in Hatfield. Including the views of various other stakeholders besides students could add value to understanding the experience of urban soundscapes in South Africa.

It is recommended that urban planners, property developers, architects, urban designers, and urban managers need to be aware of the unique and often polluted soundscapes that are associated with a studentified neighbourhood. This awareness could inform better planning, design, and policy to manage noise levels within these types of neighbourhoods and to improve overall urban livability for both students and non-student residents. Overall the night-time economy and the rhythm of student life contribute to a context that urban design should respond to.

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