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The relationship of soundscape and shopping behaviors in Malioboro Mall and Ambarrukmo Plaza, Yogyakarta

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ABSTRACT

This study investigates the acoustic comfort of shopping malls related to the standards and people's emotions. The soundscape is vital in shopping malls to attract more visitors. This research studied the soundscapes of two shopping malls in Yogyakarta, focusing on the effect of noise on the environmental perceptions of hedonic and utilitarian consumers. The research took on-site noise measurements to create sound environment maps. There were also interviews to explore their opinions about the noise inside malls. Data were statistically analyzed using Statistical Package for the Social Science. The results showed that only some soundscape elements affected arousal emotions among hedonic consumers, concerning a more extensive period of mall visits. No soundscape element affected pleasure emotions among utilitarian consumers with the length of stay in malls. Socio-cultural backgrounds of shopping culture (in traditional and modern markets) and soundscape conditions were also considered. Consumers might not aware that exposing themselves to high sound levels for long periods could impact their hearing health. The subsequent studies may continue to find the relation between acoustic comfort and the difference in the regulation.

Introduction

Consumers perceive their shopping experiences as either hedonic or utilitarian (Vieira, Santini, and Araujo 2018). The hedonic group sees shopping as an entertaining activity that evokes emotional feelings that influence their perception of shopping locations. In previous studies, consumers with hedonic instincts were individuals who spent more time shopping in their spare time (Atulkar and Kesari 2017). Hedonic people see shopping activities to seek enjoyment and social experiences, and they do not mind the crowded environment (Thomas and Saenger 2020). Consumers who emotionally enjoy the atmosphere of shopping malls will stay longer (Elmashhara and Soares 2020); therefore, influencing consumers' emotions is a vital part of creating a good impression of shopping malls. However, emotions last for shorter periods than moods (Robbins and Judge 2019). Therefore, soundscapes should induce positive feelings quickly because negative emotions may provoke avoidance behavior, such as leaving an environment (Das and Varshneya 2017). The utilitarian shoppers treat shopping as a functional activity, and pleasure induced by shopping convenience is their priority.

Shopping malls use soundscapes to influence the behavior of visitors (Cachero-Martínez and Vázquez-Casielles 2018). The soundscape is defined by the International Standard Organization (ISO) 12913-1 as the human's perception of the acoustic environment, in

context, accompanying physiological and psychological responses (Erfanian et al. 2019). Sound intensity above the recommended hearing threshold (i.e., above 70 dBA and can be as high as 90–97 dBA) dominates the soundscapes of shopping malls in Indonesia.

There are several aspects that impact soundscape in shopping malls: people talking, walking, and playing music. The music is generally used to create a warm ambiance and encourage people to shop more (Roschk, Loureiro, and Breitsohl 2017). It can also make visitors spend time longer (Yalch and Spangenberg 2000). Occasionally there are announcements and live events where people can hear them from a distance. Mostly people talking act as background noise. The combination of all those things creates a specific soundscape unique to the place and time range.

Other than soundscape, sound environments (noise, in this case) can also affect the shopping experience. Noise generates both physiological and psychological problems for humans (Park et al. 2017). Noise can be defined as unwanted and/or harmful sound (Fink 2019). Table 1 shows the permissible noise exposure limit presented by the Occupational Safety and Health Association (OSHA) and shows that higher noise intensity requires shorter exposure to avoid hearing and health problems. Two hours is the limit of exposure for noise with 90 dBA intensity.

Table 1. Permissible noise exposure limits by the OSHA

Maximum permitted daily duration (T) in hours	Maximum permissible exposure (dBA)
8	85
4	88
2	91
1	94
0.5	97
0.25 or less	100

Source: (Sivakumar, Arunachalam, and Solomon 2012)

There are several studies about soundscape in shopping malls. A study in the UK analyzed the acoustic comfort where shopping malls have been in the country for a long time (Chen and Kang 2004). A study showed acoustic comfort in shopping malls in Jordan, but there were no mentions of the cultural background (Alnuman and Altaweel 2020). A study in Russia investigated acoustic treatment significantly improved the soundscape in shopping malls (Kanev 2021). The studies had not focused on cultural aspects of acoustic comfort, especially when shopping malls are contrastingly foreign to the area.

This study investigated the acoustic comfort of shopping malls in Yogyakarta (Indonesia), a recently rural city that has developed rapidly in the last decades (Setyono, Yunus, and Giyarsih 2016). Moreover, shopping malls were relatively new, and the locals have relied on traditional markets for their daily needs (Giyarsih 2017). This study sought to find the relation between acoustic level with emotions. It also compared the preferred acoustic levels in general to the standard. The research discussed several perspectives underlying the result. The subsequent studies may continue to find the relation between acoustic comfort in varying areas.

Method

This research used the stimulus–organism–response (S–O–R) theory developed by Mehrabian and Russel (Mehrabian and Russell 1974), which states that stimuli in an environment influences the emotional state of an individual and affects his responses, including exploration, affiliation, and physical approach. In the S–O–R model, pleasure–displeasure, arousal–non-arousal, dominance–submissiveness, and the emotional response link between environmental stimuli and individual behaviors are important factors. However, dominance–submissiveness was not in this research because it has been proven weak for empirical studies (Russell and Pratt 1980).

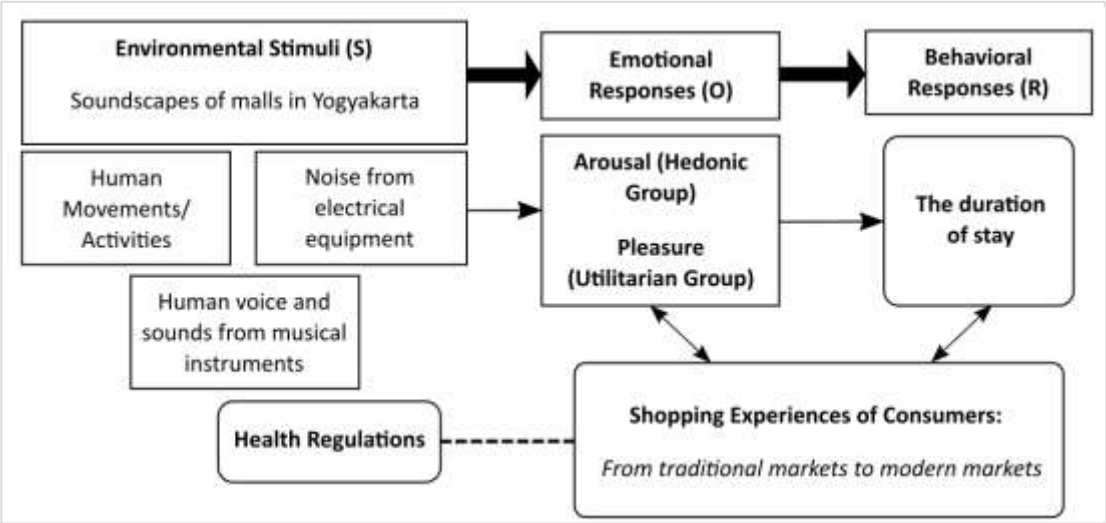

Figure 1. The research framework

The research used independent, dependent, and mediating variables. Elements of soundscapes, such as the sound of human activities and mechanical or electrical equipment, were used as independent variables. Consumers' length of stay was the dependent variable. Soundscape elements were assumed to influence consumers' emotional responses (i.e., pleasure and arousal), which ultimately affected the length of stay. This research identifies the shopping experiences of consumers based on these variables before evaluation with the permitted noise exposure limit. Figure 1 shows the research framework.

Figure 2. The atrium of Malioboro Mall

Two indoor shopping malls in Yogyakarta were studied: the Malioboro Mall and Ambarrukmo Plaza. Malioboro Mall (figure 2), the first shopping mall in Yogyakarta, was built in 1993. It has a generic, simple, and functional architectural style—typical of malls in Indonesia during the 1990s. The mall is associated with working-class shopping destinations.

Figure 3. The atrium of Ambarrukmo Plaza

Meanwhile, the construction of Ambarrukmo Plaza (figure 3) was in 2006. It adopts a grandeur architectural style, which reflects global architecture trends that accommodate local ornament. The mall is linked to upper-middle-

class shopping destinations, although this is not always the case.

Questionnaires were to collect primary data from consumers. There were thirty questionnaires distributed in Malioboro Mall and 31 in Ambarrukmo Plaza, respectively. Malioboro Mall has an area of 22,000 m^2 and six floors. Meanwhile, Ambarrukmo Plaza has an area of 120,000 m^2 and seven floors. The research used the chi-squared test to examine the variables' independence. Meanwhile, the research also utilized the independence test to determine the dependence between variables or the significance of independence. The chi-squared test values were significant at 5% ($\alpha = 0.05$). If the Asymptotic Significance (Asymp.Sig.) value was greater than α, then there was no influence between variables, and vice versa (Arifin 2017). The research used the Kaiser–Meyer–Olkin (KMO) test to examine the reliability and validity of the test. The Cronbach's alpha value is acceptable with a minimum value of 5, and the results of the anti-image correlation matrix for each item were valid when the factor-loading value was > 0.5 (Sekaran and Bougie 2019).

Questionnaires were distributed to and filled by respondents in both malls. The questionnaires implemented the arousal and pleasure dimensions (Mehrabian and Russell 1974) for measuring respondents' emotional state while shopping. Respondents then rated their feelings on a Likert scale— a usual method for measuring attitudes, opinions, and perceptions towards symptoms or phenomena (Munshi 2014). The response options were strongly agreed, agree, disagree, and strongly disagree. The research employed six points to measure pleasure: happy–unhappy, pleased–annoyed, satisfied–unsatisfied, contented–melancholic, hopeful–despairing, and relaxed–bored. Other points measured the arousal of respondents: stimulated–relaxed, excited–calm, frenzied–sluggish, jittery–dull, wide awake–sleepy and aroused–not aroused. Respondents then provided their shopping duration in the mall and the frequency of their visits.

The research uses a sound level meter to measure intensity at selected locations in both malls before mapping them with the measurement results. The research also implements Statistical Package for the Social Science (SPSS) software to process the data.

Result and discussion

Figure 4 presents the sound-level measurements at Ambarrukmo Plaza.

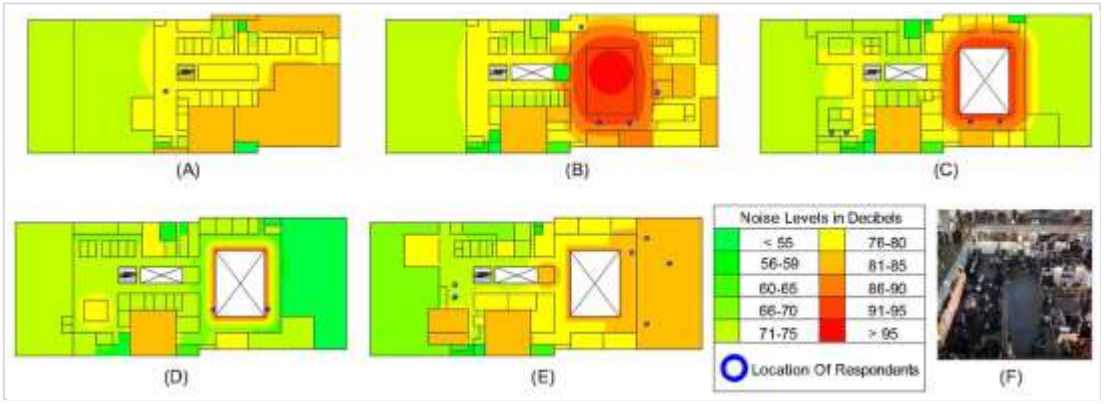

Figure 4. Sound-level distribution of the Ambarrukmo Plaza (A) basement, (B) ground floor, (C) first floor, (D) second floor, (E) third floor and (F) atrium

In the basement, the highest noise level was at a mobile phone kiosk (81–85 dB) because of the loud music and vendors proffering deals to potential customers. Meanwhile, the atrium was the loudest on the ground floor because of musical performances and promotional announcements. Noise accumulation on the ground floor reached 92 dB, and the duration of concerts was 2–4 hours. On the first floor, the noise from the ground floor was still at 81-87 dB, and concert sounds and people talking while shopping or walking through the corridor dominate the soundscape. On the second floor, sounds from the atrium on the first floor were reduced significantly to 60–65 dB

because of distance and surrounding stores playing quieter music. The bookstore on the second floor, for example, played instrumental music at 50–54 dB. The third floor is not as contrasting, with restaurants, an indoor playground, and a cinema dominating the area. The sounds of people talking while eating, human movement, and the sounds of people playing arcades were dominant here. The amusement arcade, also a playground, records an excessive soundscape at 89–90 dB due to mixed sounds of human speech, arcades, and children playing (i.e., running and yelling). The sound level was 66–70 dB in the cinema with instrumental music as an interior sound treatment.

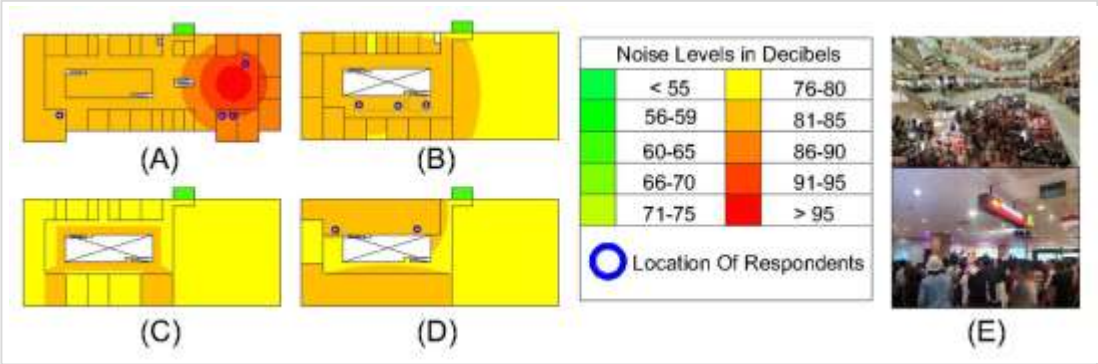

Figure 5. Sound-level distribution of the Malioboro Mall on the (A) ground floor, (B) first floor, (C) second floor, (D) third floor and (E) atrium

Figure 5 displays the sound-level measurements at Malioboro Mall. It is smaller than Ambarrukmo Plaza, with a floor-to-floor distance of 4.5 meters. The ground floor center has an atrium for sellers to sell local products, which changes weekly. The atrium has a very high noise level, reaching 97–98 dB, especially during concerts. Due to the small floor-to-floor distance of the concert venue, the sound is reflected and spread to surrounding stores. On the first floor, concert sounds are not very audible; however, this floor has an 81–85 dB noise level due to barista activity, people drinking, loud music sounds from surrounding stores, and human speech. On the second floor, the noise slightly decreased to 76–80 dB. People's voices and stores playing music (85 dB) dominate the area. Meanwhile, a food court and children's playground dominate the third floor with the sounds of people talking while eating and cooking and cutlery noises. The sounds of toy machines and human activities dominate the children's playground.

Table 2. Sound sources and mall soundscapes of Ambarrukmo Plaza

Floor	Sound Source	Soundscapes
Basement	Noise from sellers and consumers, loud music concert	Voices and instruments
Ground Floor	Very loud music concert, people talking	Voices and instruments
First Floor	Noise from loud music concert, people talking	
Second Floor	Reduced music concert sounds from the ground floor	Voices and instruments
Third Floor	Noise from the kitchen (cooking, kitchen appliances and staff communication)	Human activity, voices and instruments
	Eating activities (glassware and tableware clinking and slurping)	Human activity
	Children playing (movement, talking and toys)	Human activity and electro-mechanical

Table 3. Sound sources and mall soundscapes of Malioboro Mall

Floor	Sound source	Soundscapes
Ground Floor	Noise from sellers to consumers, loud music concert	Voices and instruments
First Floor	Reduced music concert sounds from the ground floor	Voices and instruments
	Loud music sounds from stores	Voices and instruments
	Barista activity	Human activity
	People drinking (slurping and clinking)	Human activity
Second Floor	Reduced music concert sounds from the ground floor	Voices and instruments
	Loud music sounds from stores	Voices and instruments
Third Floor	Noise from the kitchen (cooking, kitchen appliances and staff communication)	Human activity, voices and instruments and electro-mechanical
	Eating activities (glassware and tableware clinking and slurping)	Human activity
	Children playing (movement, talking and toys)	Human activity and electro-mechanical

Reliability and validity tests

The KMO results showed statistical reliability based on a Cronbach's Alpha value above the minimum of 0.5. Thus, it indicated the reliability of the questionnaire variables. The results from the anti-image correlation matrix indicated that all items had a sampling adequacy measurement (MSA) above the acceptable value of 0.5. Table 4, 5, 6 shows the factor loading and Cronbach's Alpha values for pleasure and arousal in every soundscape variable.

Table 4. Factors loading and reliability analysis: voices and instruments

Questionnaire item	Factor loading	Cronbach's alpha
Pleasure dimensions		
Unhappy–happy	.797[a]	.619
Annoyed–pleased	.790[a]	
Unsatisfied–satisfied	.765[a]	
Melancholic–contented	.857[a]	
Despairing–hopeful	.824[a]	
Bored–relaxed	.820[a]	
Arousal dimensions		
Relaxed–stimulated	.665[a]	.619
Calm–excited	.807[a]	
Sluggish–frenzied	.785[a]	
Dull–jittery	.746[a]	
Sleepy–wide-awake	.614[a]	
Non-aroused–aroused	.759[a]	

[a] MSA

Table 5. Factors loading and reliability analysis: human activity/movement

Questionnaire item	Factor loading	Cronbach's alpha
Pleasure dimensions		
Unhappy–happy	.844[a]	.615
Annoyed–pleased	.869[a]	
Unsatisfied–satisfied	.880[a]	
Melancholic–contented	.834[a]	
Despairing–hopeful	.926[a]	
Bored–relaxed	.881[a]	
Arousal dimensions		
Relaxed–stimulated	.852[a]	.615
Calm–excited	.901[a]	
Sluggish–frenzied	.885[a]	
Dull–jittery	.897[a]	
Sleepy–wide-awake	.665[a]	
Non-aroused–aroused	.826[a]	

[a] MSA

Table 6. Factors loading and reliability analysis: electro-mechanical

Questionnaire item	Factor loading	Cronbach's alpha
Pleasure dimensions		
Unhappy–Happy	.928[a]	.607
Annoyed–Pleased	.791[a]	
Unsatisfied–Satisfied	.822[a]	
Melancholic–Contented	.877[a]	
Despairing–Hopeful	.819[a]	
Bored–Relaxed	.742[a]	
Arousal Dimensions		
Relaxed–Stimulated	.850[a]	.607
Calm–Excited	.837[a]	
Sluggish–Frenzied	.863[a]	
Dull–Jittery	.756[a]	
Sleepy–Wide-Awake	.777[a]	
Non-aroused–Aroused	.852[a]	

[a] MSA

Test of independence

The research conducted an independence test to determine dependence between variables. Table 7, 8, 9 shows that the soundscape of human

activity and movement produce positive shopping emotions (i.e., arousal) for an extensive period with an Asymp.Sig. of 0.01. The results of the second statistical analysis show a positive connection between soundscape elements (i.e., voices and instruments) and the duration of hedonic consumers shopping with an Asymp.Sig. of 0.00. However, the electro-mechanical variable did not affect the emotional response of consumers or more extensive shopping periods. Thus, only two variables of soundscapes affected the emotional reaction of hedonic consumers for long periods while shopping. No soundscape elements affected utilitarian consumers, supported by the independent test results that had a significance of above 5% in each.

Table 7. Analysis of independence test using a pearson chi-square test: Human activity/movement

	Arousal	Pleasure
Duration of stay: Negative	25	34
(percentage)	41%	55.7%
Duration of stay: Positive	36	27
(percentage)	59%	44.3%
Total duration of stay	61	61
(percentage)	100.0%	100.0%
Pearson chi-square value	6.689[a]	1.025[a]
Pearson chi-square df	1	1
Asymp. sig. (2-sided)	.010	.311

[a] 0 cells (0.0%) have expected counts less than 5. The minimum expected count is 11.95

Table 8. Analysis of independence test using a pearson chi-square test: Voices and instruments

	Arousal	Pleasure
Duration of stay: Negative	25	40
(percentage)	41%	65.6%
Duration of stay: Positive	36	21
(percentage)	59%	34.4%
Total duration of stay	61	61
(percentage)	100.0%	100.0%
Pearson chi-square value	13.211[a]	.026[a]
Pearson chi-square df	1	1
Asymp. sig. (2-sided)	.000	.873

[a] 0 cells (0.0%) have expected counts less than 5. The minimum expected count is 11.95

Table 9. Analysis of independence test using a pearson chi-square test: Electro-mechanical

	Arousal	Pleasure
Duration of stay: Negative	27	34
(percentage)	44.3%	55.7%
Duration of stay: Positive	34	27
(percentage)	55.7%	44.3%
Total duration of stay	61	61
(percentage)	100.0%	100.0%
Duration of stay: Negative	27	34
Pearson chi-square value	2.345[a]	.296[a]
Pearson chi-square df	1	1
Asymp. sig. (2-sided)	.126	.586

[a] 0 cells (0.0%) have expected counts less than 5. The minimum expected count is 11.95

Health regulations and the duration of stay

Table 10 shows that consumers who shopped for less than two hours accounted for 44.3% of consumers, while those who shopped for more than two hours accounted for 55.7%.

Table 10. Univariate tables of consumers' shopping time in both malls

Duration	Frequency	Percent	Maximum permissible exposure regulation (dB)
< 2 hours	27	44.3	92–100 dB
2–4 hours	30	49.3	88–91 dB
< 4 hours	4	6.4	85–87 dB
Total	61	100.0	

Around forty-four percent shopped for ess than two hours. They might not experience hearing damage caused by the noise due to their short shopping time. However, the shoppers who shopped longer than two hours, 55.7% of consumers, should have only been exposed to 91 dB according to health hearing regulations. The atriums of the two malls (see figures 2 and 3) have sound levels of 97–98 dB during 2–4 hour-long concerts.

The hedonic shoppers did not solely visit the shopping malls for the music. However, the loud music (97–98 dB up to 4 hours) encouraged them to have a more extensive duration of stay. Eighty-five dB for up to a maximum of eight hours is the highest safe exposure level according to WHO (World Health Organization 2015). Meanwhile, starting from 80 dB is a typical sound level for an orchestra performance (Meyer 2009) and up to 120 dB for rock concerts (Purdon 2021). The loud, regular, or prolonged sound may cause irreversible and hearing loss. It is vital to exude a safe sound exposure level to maintain hearing health for shoppers and mall workers.

We found that both malls have high levels of noise. Another study also found similar conditions in Sheffield's shopping malls with a high and fluctuating noise level and a variety of respondents' perceived comfort (Chen and Kang 2004). Other factors may also influence acoustic comfort. Another study pointed out that income

and occupation also affected subjective loudness and acoustic comfort (Meng and Kang 2013). It also found similar findings that people who waited for other people in malls tend to have less acoustic comfort than people who come to shop. People who have other activities in mind may be less focused on their surroundings (Meng and Kang 2013).

Cultural settings may influence people's perception of comfort, which is an already subjective matter. People's behavior in traditional markets may shape their perception of soundscapes in shopping malls. Loud soundscapes are not unusual in traditional markets, although they rarely exceed 90 dBA. A study also found that the soundscape may not lead to sensory overload (Doucé and Adams 2020); thus, not significantly affecting comfort. The locals shop their daily needs in traditional markets as the price is lower and they can bargain. They usually go to shopping malls on the weekend as a recreational activity. The locals can eat food from around the world in a thermally comfortable environment, contrasting their warungs that lack cooling. Shopping (and window shopping) the latest global and local trends is also a recreational activity. The children can visit arcade centers and play games different from the usual traditional games or sports.

In general, the culture as a whole may also impact their tolerance for loud noise. The soundscape of traditional markets in Indonesia is louder than the recommended standard (Mukhlishin 2020). People hold weddings on streets where they play loud Dangdut music all day (Weintraub 2018) (and sometimes continue to the night). There are routine Islamic calls to prayer (*Adzan*) from mosques several times a day (Pratisti 2020), an anticipated occurrence for the largest Islam population in the world. As the fourth most populated country, crowds and motorbikes' noise is also in the soundscape (Colombijn 2007). Different culture also has diverse perceived comfort. A study showed a difference between the thermal comfort of Swedish and Japanese people (Knez and Thorsson 2006). Occupation also plays a role in determining acoustic comfort. A study found farmers' quiet environment may influence their higher subjective loudness compared to other professions (Meng and Kang 2013). In this case, the tolerance for loudness in Indonesia may be higher than in some countries. People in Indonesia celebrate loudness on some occasions. In effect, it impacts their acoustic level tolerance.

Moreover, lawmakers also constructed acoustic regulations for health concerns in mind. This study results showed mall visitors' comfort level is higher than the regulation. The visitors were not aware of the impact of the malls' high sound level on their hearing health. However, the workers might experience otherwise, as a study in shopping malls in Jordan found malls' workers experienced headaches because of the recurring high noise level (Alnuman and Altaweel 2020). It is vital to integrate safe acoustic levels into shopping malls for the health of both the workers and the visitors. Although comfort is subjective, health concerns are objective. Soundscape constantly more than 90 dB can contribute to hearing loss (Lutman 2000). Laws encourage optimal, comfortable, and healthy acoustic environments.

Acoustic treatment can create a more healthy acoustic environment in shopping malls. A study in Russia showed implementing sound-absorbing materials in food courts displayed significant acoustic improvement (Kanev 2021). The mall workers can have a more comfortable shift, while the visitors can enjoy more clear sound because of the acoustic treatment. Therefore, the acoustic environment can bring activities more comfortable in shopping malls.

Providing a healthy and enjoyable soundscape is vital for shopping malls. It affects the shopping experience. People are more likely to stay longer in shopping malls if they enjoy the soundscape. They serve as recreational facilities for the people in Yogyakarta to gather with their families during the weekends. A comfortable and healthy soundscape provides maximum enjoyment for people, so they can temporarily detach from their busy lives.

Conclusion

Hedonic and utilitarian shoppers react differently to the soundscapes of malls. All soundscape elements affect the emotional responses of hedonic consumers except electro-mechanical sounds. Human voices, activities, and music generate emotional responses that prompt hedonic consumers to shop longer. In general, loud music can result in sensory overload (Beudaert, Gorge, and Herbert 2017) that correlates with less time

spent shopping. However, loud music was a trigger to shop longer among hedonic consumers in Indonesia. It is also reflected in the shopping style changes in Yogyakarta because malls accommodate the socializing, music, and entertainment needs of hedonic consumers. For example, music influences shoppers' emotions, but it also may affect the duration of hedonic-oriented consumers' stay in stores (Yi and Kang 2019).

Music has become an environmental stimulus often used in retail-based research. In Indonesia, this study found that human movement and activity was also a surrounding stimulus for consumers that prompted them to shop longer. Restaurants primarily showcase these sounds. Moreover, the results also showed that sounds of cooking and eating were experienced as enjoyable, which may explain a current trend in Indonesian restaurants to allow consumers to view chefs while they cook. Human activities and other shopping mall's offers are stimuli that influence people's choice to revisit in the future (Makgopa 2018). In contrast, practical consumers in Yogyakarta were not affected by all aspects of the soundscapes of the malls. Utilitarian shopping is a principle of behavior for people to buy products that are practical, rational, or functional (Sütütemiz and Saygılı 2020).

However, neither group might not aware that the malls' high sound levels had the potential to damage their hearing health. Additionally, shopkeepers working in the atriums were at risk of hearing problems because they worked for an average of six hours per day. Figure 4 and Figure 5 show the occurrence of more than 80 dB of sound intensity in some stores around the atriums, caused by reflective surfaces around them. Applying sound absorbers to the surfaces around the atrium can reduce reflected sounds and produce clear sounds with lower intensity. Therefore, it is possible to provide a healthier soundscape while maintaining an enjoyable atmosphere.

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References

Alnuman, Nasim, and Mhd Z Altaweel. 2020. "Investigation of the Acoustical Environment in A Shopping Mall and Its Correlation to the Acoustic Comfort of the Workers." *Applied Sciences.* https://doi.org/10.3390/app10031170.

Arifin, J. 2017. *SPSS 24 Untuk Penelitian Dan Skripsi*. Jakarta, Indonesia: PT. Elex Media Komputindo.

Atulkar, Sunil, and Bikrant Kesari. 2017. "Satisfaction, Loyalty and Repatronage Intentions: Role of Hedonic Shopping Values." *Journal of Retailing and Consumer Services* 39: 23–34. https://doi.org/10.1016/j.jretconser.2017.06.013.

Beudaert, Anthony, Hélène Gorge, and Maud Herbert. 2017. "An Exploration of Servicescapes' Exclusion and Coping Strategies of Consumers with 'Hidden' Auditory Disorders." *Journal of Services Marketing* 31 (4/5): 326–38. https://doi.org/10.1108/JSM-06-2016-0247.

Cachero-Martínez, Silvia, and Rodolfo Vázquez-Casielles. 2018. "Developing the Marketing Experience to Increase Shopping Time: The Moderating Effect of Visit Frequency." *Administrative Sciences.* https://doi.org/10.3390/admsci8040077.

Chen, Bing, and Jian Kang. 2004. "Acoustic Comfort in Shopping Mall Atrium Spaces—A Case Study in Sheffield Meadowhall." *Architectural Science Review* 47 (2): 107–14. https://doi.org/10.1080/00038628.2004.9697033.

Colombijn, Freek. 2007. "Toooot! Vroooom! The Urban Soundscape in Indonesia." *Sojourn: Journal of Social Issues in Southeast Asia* 22 (2): 255–72.

Das, Gopal, and Geetika Varshneya. 2017. "Consumer Emotions: Determinants and Outcomes in a Shopping Mall." *Journal of Retailing and Consumer Services* 38: 177–85.

https://doi.org/10.1016/j.jretconser.2017.06.008.

Doucé, Lieve, and Carmen Adams. 2020. "Sensory Overload in a Shopping Environment: Not Every Sensory Modality Leads to Too Much Stimulation." *Journal of Retailing and Consumer Services* 57: 102154. https://doi.org/10.1016/j.jretconser.2020.102154.

Elmashhara, Maher Georges, and Ana Maria Soares. 2020. "Entertain Me, I'll Stay Longer! The Influence of Types of Entertainment on Mall Shoppers' Emotions and Behavior." *Journal of Consumer Marketing* 37 (1): 87–98. https://doi.org/10.1108/JCM-03-2019-3129.

Erfanian, Mercede, Andrew J Mitchell, Jian Kang, and Francesco Aletta. 2019. "The Psychophysiological Implications of Soundscape: A Systematic Review of Empirical Literature and a Research Agenda." *International Journal of Environmental Research and Public Health*. https://doi.org/10.3390/ijerph16193533.

Fink, Daniel. 2019. "A New Definition of Noise: Noise Is Unwanted and/or Harmful Sound. Noise Is the New 'Secondhand Smoke'." *Proceedings of Meetings on Acoustics* 39 (1): 50002. https://doi.org/10.1121/2.0001186.

Giyarsih, Sri Rum. 2017. "Factors That Affect Urban Sprawl Symptoms in Sub Urban Areas of Yogyakarta." *INA-Rxiv*. https://doi.org/10.31227/osf.io/juc26.

Kanev, Nikolay. 2021. "Study and Improvement of Acoustic Conditions in Public Spaces of Shopping Malls." *Acoustics*. https://doi.org/10.3390/acoustics3010011.

Knez, Igor, and Sofia Thorsson. 2006. "Influences of Culture and Environmental Attitude on Thermal, Emotional and Perceptual Evaluations of a Public Square." *International Journal of Biometeorology* 50 (5): 258–68. https://doi.org/10.1007/s00484-006-0024-0.

Lutman, M E. 2000. "What Is the Risk of Noise-Induced Hearing Loss at 80, 85, 90 DB(A) and Above?" *Occupational Medicine* 50 (4): 274–75. https://doi.org/10.1093/occmed/50.4.274.

Makgopa, Sipho. 2018. "Determining Shopping Malls Customers' Satisfaction and Loyalty." *Journal of Business & Retail Management Research* 13 (October). https://doi.org/10.24052/JBRMR/V13IS01/ART-12.

Mehrabian, Albert, and James A. Russell. 1974. *An Approach to Environmental Psychology*. Cambridge, MA, USA: MIT Press.

Meng, Qi, and Jian Kang. 2013. "Influence of Social and Behavioural Characteristics of Users on Their Evaluation of Subjective Loudness and Acoustic Comfort in Shopping Malls." *PLOS ONE* 8 (1): e54497.

Meyer, Jürgen. 2009. *Acoustics and the Performance of Music*. New York, NY: Springer. https://doi.org/10.1007/978-0-387-09517-2.

Mukhlishin, Ahmad Styvani Alfiyanul. 2020. "Analisis Korelasi Kebisingan Dan Konsentrasi Karbon Monoksida (CO) Dengan Kendaraan Bermotor Di Pasar Krian Sidoarjo." UIN Sunan Ampel Surabaya.

Munshi, Jamal. 2014. "A Method for Constructing Likert Scales."

Park, Jangho, Seockhoon Chung, Jiho Lee, Joo Hyun Sung, Seung Woo Cho, and Chang Sun Sim. 2017. "Noise Sensitivity, rather than Noise Level, Predicts the Non-Auditory Effects of Noise in Community Samples: A Population-Based Survey." *BMC Public Health* 17 (1): 315. https://doi.org/10.1186/s12889-017-4244-5.

Pratisti, Siti Aliyuna. 2020. "Negotiating Soundscape: Practice and Regulation of Adzan in Indonesia." *Journal of Indonesian Social Sciences and Humanities (JISSH)* 10 (2): 75–84. https://doi.org/10.14203/jissh.v10i2.180.

Purdon, Jean. 2021. "Ocean Noise at FULL BLAST." *Quest* 17 (1): 23–25.

Robbins, Stephen P., and A. Timothy A. Judge. 2019. *Organizational Behavior*. 18th Editi. New York City, NY, USA: Pearson.

Roschk, Holger, Sandra Maria Correia Loureiro, and Jan Breitsohl. 2017. "Calibrating 30 Years of Experimental Research: A Meta-Analysis of the Atmospheric Effects of Music, Scent, and Color." *Journal of Retailing* 93 (2): 228–40. https://doi.org/10.1016/j.jretai.2016.10.001.

Russell, James A, and Geraldine Pratt. 1980. "A Description of the Affective Quality Attributed to Environments." *Journal of Personality and Social Psychology* 38 (2):

311–22. https://doi.org/10.1037/0022-3514.38.2.311.

Sekaran, Uma, and Roger Bougie. 2019. *Research Methods for Business: A Skill Building Approach*. 8th Editio. Hoboken, NJ, USA: Wiley.

Setyono, Jawoto Sih, Hadi Sabari Yunus, and Sri Rum Giyarsih. 2016. "The Spatial Pattern of Urbanization and Small Cities Development in Central Java: A Case Study of Semarang-Yogyakarta-Surakarta Region." *Geoplanning: Journal of Geomatics and Planning; Vol 3, No 1 (2016)* 3 (1): 53–66. https://doi.org/10.14710/geoplanning.3.1.53-66.

Sütütemiz, N., and M. Saygılı. 2020. "The Effects of Hedonic and Utilitarian Shopping Motivations on Online Purchasing Intentions: A Turkish Case Study." *The Retail and Marketing Review* 16 (1): 61–83. https://doi.org/10.10520/EJC-1ea7711ded.

Thomas, Veronica L, and Christina Saenger. 2020. "Feeling Excluded? Join the Crowd: How Social Exclusion Affects Approach Behavior toward Consumer-Dense Retail Environments." *Journal of Business Research* 120: 520–28. https://doi.org/10.1016/j.jbusres.2018.12.064.

Vieira, Valter, Fernando Oliveira Santini, and Clécio Falcao Araujo. 2018. "A Meta-Analytic Review of Hedonic and Utilitarian Shopping Values." *Journal of Consumer Marketing* 35 (4): 426–37. https://doi.org/10.1108/JCM-08-2016-1914.

Weintraub, Andrew N. 2018. "Nation, Islam, and Gender in Dangdut, Indonesia's Most Popular Music." In *Routledge Handbook of Contemporary Indonesia*, 9. London: Routledge.

World Health Organization. 2015. "Make Listening Safe."

Yalch, Richard F, and Eric R Spangenberg. 2000. "The Effects of Music in a Retail Setting on Real and Perceived Shopping Times." *Journal of Business Research* 49 (2): 139–47. https://doi.org/10.1016/S0148-2963(99)00003-X.

Yi, Fashu, and Jian Kang. 2019. "Effect of Background and Foreground Music on Satisfaction, Behavior, and Emotional Responses in Public Spaces of Shopping Malls." *Applied Acoustics* 145: 408–19. https://doi.org/10.1016/j.apacoust.2018.10.029.

Author(s) contribution

Verza Dillano Gharata contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Sushardjanti Felasari contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

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