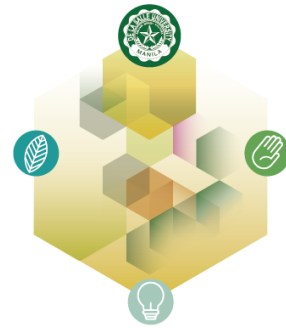


## Fostering a Humane and Green Future: Pathways to Inclusive Societies and Sustainable Development



### Pedestrian Distress and Violations among Residents of Metro Manila: A Reflection of Urban Design in the Country's Capital

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**Abstract:** The Philippines' Metro Manila is crowned as the locus of rapid urbanization in the country in terms of infrastructure and population density. With consideration to the sociopolitical economic landscape and the urban design of the region, the average Filipino is required to mobilize by walking despite everyday risks and threats in order to arrive at a destination. This descriptive-correlational quantitative study is intended to measure the degree of pedestrian distress and identify its relationship with the assessed quality of urban design and the likelihood of offensive street behavior among Metro Manila residents. The gathered data was derived from 141 survey respondents of a self-administered online questionnaire and used a non-probability sampling method, convenience sampling. Results displayed that the respondents scored a moderate level of pedestrian distress on average ( $M=3.26$ ,  $SD=0.62$ ) as well as for assessed quality of urban design ( $M=2.42$ ,  $SD=0.40$ ), while likelihood of offensive street behavior displayed low levels ( $M=2.02$ ,  $SD=0.58$ ). Furthermore, assessed quality of urban design and pedestrian distress were found to significantly correlate with one another, while pedestrian distress and likelihood of offensive street behavior had no significant correlation with one another. In conclusion, despite the daily experiences of distress due to urban design, offensive street behavior is not an immediate response by pedestrians.

**Key Words:** pedestrian distress; urban design; offensive street behavior; metro manila

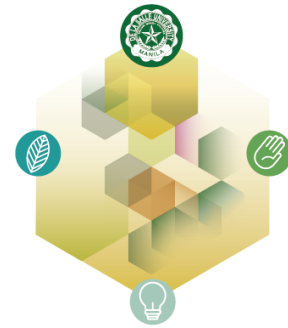
## 1. INTRODUCTION

### 1.1 Background of the Study

The Asian Development Bank (ADB) acknowledges that walking is the main mode of transportation people rely on, (Leather, et. al., 2011). However, with a large number of pedestrians, Metro Manila lacks mobility (Palafox, 2021, as cited in Hallare, 2021) and is designed to prioritize cars and capital (Santos, 2022) making the city less pedestrian-friendly. Such urban design choices contribute to making roads more dangerous, which ultimately places pedestrian safety at risk. ADB dubs pedestrians as one of the most vulnerable road users in the Asian and Pacific Region, along with pedal cyclists, non-motorized vehicle users,

and motorcyclists due to their higher risk of getting involved in a road accident (ADB, 2003). Apart from accidents, the streets of Metro Manila are also perceived to be crime infested based on a yearly index of crimes (San Juan, 2019). These figures serve to be alarming to other pedestrians, leading to anticipatory fear in the streets especially when walking spaces appear to be non-pedestrian friendly. Considering this, it is inferred that pedestrians in the Philippines, mainly in large and busy urbanized cities such as Metro Manila, experience distress in their everyday travel. In order to deflect this distress, it is presumed that pedestrians resort to aggressive street behaviors as a defense mechanism against the dangers present while walking. While urban design does not consider pedestrians, so do traffic laws. Enforcers fail to acknowledge that pedestrians have great significance on traffic systems. Compared to other

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road users, pedestrians are the least subjected to any street rules and regulations (King et al., 2009), with their desire for safety acting as their main compass. Otherwise, the unsafe state of roads may lead to pedestrians unknowingly or involuntarily acting amiss as a last resort. In addition to being invisible to traffic enforcers, pedestrians are also ignored by drivers, which makes them more vulnerable to danger. As such, pedestrian-related violations, accidents, and neglect such as illegal pedestrian movements, inattentiveness, management, and lack of reasonable facilities are pervasive social problems that need to be addressed (Zhang et al., 2017). With the growing population and urbanization of Metro Manila, a study focused on pedestrian violation is imperative in creating alleviation regarding this problem. We believe that this can be analyzed by looking into the degree of pedestrian distress, which we presume is a result of the capital's urban design.

### 1.2 Conceptual Framework

This study primarily aims to discover the degree of pedestrian distress among residents of Manila City and how it is influenced by their assessed quality of urban design in Manila. Furthermore, it is presumed that their likelihood to commit offensive street behavior is a result of their degree of distress. Overall, the variables explored in this study are the following: assessed quality of urban design, degree of pedestrian distress, and likelihood of offensive street behavior.

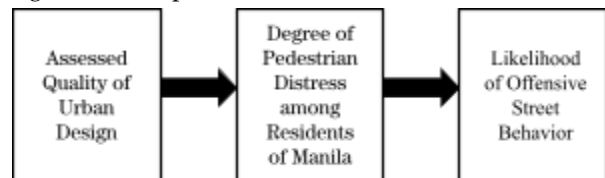
Distress is mostly characterized as the aversive, negative state wherein coping and adaptation processes are unable to bring an organism back to physiological and/or psychological homeostasis (Carstens and Moberg 2000; Moberg 1987; NRC 1992, as cited in National Research Council (US) Committee, 2008). In this study, pedestrian distress is described by the unpleasant feelings of pedestrians affected by social encounters during their everyday travel on pedestrian infrastructures around the city of Manila.

The assessed quality of urban design is based on the pedestrians' perception of the characteristics of Manila's urban design. The perception of pedestrians on urban design quality is also an important factor to achieve a safe and desirable walking environment (Kinyingi et al., 2020). This includes the characteristics of urban design elements such as buildings, public space, streets, transport, and landscapes.

The likelihood of offensive street behavior can describe the characteristics of pedestrians who refuse to observe the rules or policies with regard to street

crossing. Ghomi and Hussein (2022) classified pedestrian violations as temporal and spatial violations. Temporal violations are concerned with signals such as crossing during 'Do Not Walk' flash signs. Spatial violations are associated with activity in undesignated places such as jaywalking in non-crosswalk areas. Contextualized to the study, the likelihood of offensive street behavior is a significant element in displaying the utilization or enactment of violations as a way of achieving convenience as a pedestrian.

Figure 1. Conceptual Framework



### 1.3 Objectives of the Study

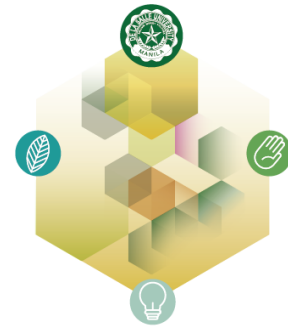
This study aims to determine the degree of pedestrian distress among residents of Manila City. This also determines its association with their assessed quality of urban design, as well as their likelihood to commit offensive street behavior as associated outcomes.

This research aims to answer and discuss the following questions at the end of the study:

1. What are the personal characteristics of residents who live in Manila?
2. What is their assessed quality of urban design?
3. What is their degree of pedestrian distress?
4. What is their likelihood of offensive street behavior?
5. How does their degree of pedestrian distress associate with their assessed quality of urban design and likelihood of offensive street behavior?

## 2. MATERIAL AND METHODOLOGY

This study used a quantitative research design, specifically a descriptive-correlational approach. An online questionnaire was administered through convenience sampling due to time constraints, leading to a total of 141 survey respondents who reside in Metro Manila. The questionnaire underwent pre-testing to identify which items should be kept or discarded before administering the final survey. Cronbach's Test (Alpha)



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was used as a reliability test and it was performed using the Jamovi version 2.3.21. Descriptive and inferential statistics were utilized in analyzing the data gathered.

The first part contains seven questions about the respondents' socio-demographic and pedestrian-related characteristics including age, gender, primary mode of transport, most common purpose of trips, vehicle ownership, number of vehicles owned, and Metro Manila City they are currently residing in.

The second part measured the assessed quality of urban design. The basis used for measuring their assessment of urban design quality was adapted from the Neighborhood Environment Walkability Scale (NEWS) developed by Saelens, et. al. (2003). Some phrases and elements of the questionnaire were modified to fit the context of the study. Overall, there are a total of five subscales namely: (1) safety, (2) traffic hazards, (3) places for walking, (4) access and barriers, and (5) aesthetics—with 28 items in total. The original 4-point scale was kept for this study, and the scores are interpreted as 4 = strongly agree, 3 = somewhat agree, 2 = somewhat disagree, and 1 = strongly disagree.

The third part of the questionnaire asks about the respondents' degree of distress they experience as pedestrians. 13 items compose this part including adapted and modified items from Watson and Friend's (1969) Social Avoidance and Distress Scale (SADS). The study used a 5-point Likert scale for this part of the questionnaire, and the scores are interpreted as follows: 5 = strongly agree, 4 = somewhat agree, 3 = neutral, 2 = somewhat disagree, and 1 = strongly disagree.

For the last part of the questionnaire, it measures the respondents' likelihood of offensive street behavior with 28 items adapted from the Pedestrian Behavior Questionnaire (PBQ) modified by Deb et al., (2017) from the self-report pedestrian behavior scale (PBS) developed by Granié et al. (2013). This part used a 6-point Likert scale where scores are interpreted as 1 = never, 2 = quite infrequently, 3 = infrequently, 4 = frequently, 5 = quite frequently, and 6 = always.

### 3. RESULTS AND DISCUSSION

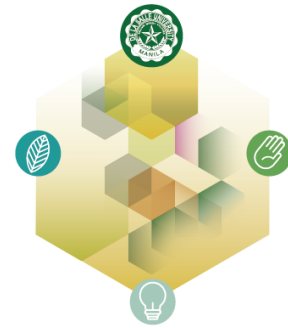
This section presents the results of the study. It also tackles the association of variables including the association of socio-demographic characteristics and pedestrian distress, the association of assessed quality of urban design and pedestrian distress, and the association of pedestrian distress and likelihood of offensive street behavior.

#### 3.1. Profile of the respondents

Table 1 presents the socio-demographic profile of the respondents. The mean age is  $24.24 \pm 7.818$ . The majority of the respondents are female/woman (61.7%), own a vehicle (72.3%), take public transport as their primary mode of transport (60.3%), reside in Navotas City (22.7%), and their main purpose of the trip is school-related (61.7%).

Table 1. Socio-Demographic Profile of Respondents (N=141)

Variable	n (Mean)	% (SD)
<b>Age</b>	24.24	7.818
<b>Gender</b>		
Female/Woman	87	61.7%
Male/Man	45	31.9%
Non-binary	9	6.4%
<b>Vehicle Ownership</b>		
Yes	102	72.3%
No	39	27.7%
<b>No. of Vehicles Owned</b>	1.52	1.318
<b>Primary Mode of Transport</b>		
Walking	7	5.0%
Public Transport	85	60.3%
Private Vehicle	41	29.1%
Two-wheeled Vehicle	8	5.7%
<b>City in Manila</b>		
Caloocan City	11	7.8%
Las Piñas City	5	3.5%
Makati City	5	3.5%
Malabon City	7	5.0%
Mandaluyong City	2	1.4%
Manila City	23	16.3%
Marikina City	4	2.8%
Muntinlupa City	3	2.1%
Navotas City	32	22.7%
Parañaque City	5	3.5%
Pasay City	5	3.5%
Pasig City	4	2.8%
Quezon City	18	12.8%
San Juan City	0	0%
Taguig City	8	5.7%
Valenzuela City	9	6.4%
<b>Main Purpose of Trip</b>		
Work-related	28	19.9%
School-related	87	61.7%
Recreation	22	15.6%
Shopping	4	2.8%



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### 3.2. Descriptive Statistics

Table 2 presents the descriptive statistics of the three variables of the study. Results show the overall moderate degree of pedestrian distress (M=3.26, SD=0.62) from the respondents which describe that most respondents seem to have average feelings of distress and unpleasant experiences as they travel on Metro Manila’s pedestrian infrastructures. Results also revealed the respondents’ moderate level of assessment of the quality of urban design. Lastly, most respondents exhibited a low likelihood of committing offensive street behavior.

Table 2. Descriptive Statistics of the Variables

Variable	Domain	M	SD	Interpretation
<b>Assessed Quality of Urban Design</b>	Safety	2.19	0.59	Moderate
	Traffic Hazards	2.73	0.77	Moderate
	Places for Walking	2.44	0.74	Moderate
	Access and Barriers	2.47	0.50	Moderate
	Aesthetics	2.26	0.77	Moderate
<b>Overall Mean</b>		<b>2.42</b>	<b>0.40</b>	<b>Moderate</b>
<b>Degree of Pedestrian Distress</b>	<b>Overall Mean</b>	<b>3.26</b>	<b>0.62</b>	<b>Moderate</b>
<b>likelihood of Offensive Street Behavior</b>	Violations	2.15	0.79	Low
	Errors	2.52	0.89	Low
	Lapses	2.05	0.88	Low
	Aggressive Behaviors	1.38	0.56	Low
	<b>Overall Mean</b>	<b>2.02</b>	<b>0.58</b>	<b>Low</b>

*Assessed Quality of Urban Design (High = 3.01 – 4.00; Moderate =2.01 – 3.00; Low = 1.00 – 2.00)*

*Degree of Pedestrian Distress (High = 3.67 – 5.00; Moderate = 2.34 – 3.66; Low = 1.00 – 2.33)*  
*likelihood of Offensive Street Behavior (High = 4.34 – 6.00; Moderate = 2.67 – 4.33; Low = 1.00 – 2.66)*

### 3.3. Test for Correlation

Table 3 presents the results from the test for correlation between the respondents’ degree of pedestrian distress and assessed quality of urban design. Results show that all domains under this variable have a negative significant correlation with the main variable, except for the domain, traffic hazards; safety and aesthetics have a strong correlation, while places for walking and access and barriers weakly correlate with the main variable.

Table 3. Test for correlation of Degree of Pedestrian Distress and Assessed Quality of Urban Design

	Degree of Pedestrian Distress	
	r <sub>s</sub> -value	p-value
Safety	-0.445***	<.001
Traffic Hazards	0.134	0.114
Places for Walking	-0.285***	<.001
Access and Barriers	-0.297***	<.001
Aesthetics	-0.307***	<.001

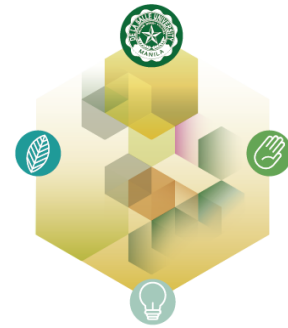
Note. \* p <.05 \*\* p <.01 \*\*\* p<.001

Table 4 presents the correlation test results between the variables, degree of pedestrian distress, and likelihood of offensive street behavior showing that there is no significant correlation between the two.

Table 4. Test for correlation of Degree of Pedestrian Distress and likelihood of Offensive Street Behavior

	Degree of Pedestrian Distress	
	r <sub>s</sub> -value	p-value
Violations	-0.128	0.130
Errors	0.064	0.451
Lapses	0.006	0.948
Aggressive Behaviors	0.058	0.493

Note. \* p <.05 \*\* p <.01 \*\*\* p<.001



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### 4. CONCLUSIONS

The descriptive results indicated that most of the respondents appeared to have moderate feelings of distress and encounter unpleasant experiences as they travel on Metro Manila's pedestrian infrastructures as the table indicates overall moderate degree of pedestrian distress. Additionally, the univariate analysis for the independent variables revealed that the respondents have an overall moderate level of assessed quality in urban design with every domain scoring a moderate level. Its highest domain, traffic hazard, scored the highest indicating that the respondents have observed the presence of hazards in the streets, while the lowest ranking is safety, which showcased feelings of unsafeness regarding walking the streets of Metro Manila. The outcome variable of the study, likelihood of offensive street behavior, overall manifested a low score along with all of its corresponding domains. The highest-scoring domain would be errors while the lowest would be aggressive behaviors. With all domains under the likelihood of offensive street behavior having low levels, the interpretation derived from this is that respondents have low levels in terms of immediate response to pedestrian stressors.

Based on the tests for correlation results, it can be inferred that the overall level of assessed quality of urban design domains and their association with pedestrian distress differ from each other with safety and pedestrian distress having displayed significant moderate correlation with each other. On the other hand, traffic hazards and pedestrian distress has shown insignificant correlation; places for walking with significant high correlation; access and barriers with significant low correlation; and aesthetics with significant high correlation with pedestrian distress. As for correlations between likelihood of offensive street behavior and pedestrian distress; violations, errors, lapses, and aggressive behaviors, all have no significant correlation with pedestrian distress. Conclusively, while the assessed quality of urban design exhibited correlations with pedestrian distress to an extent, likelihood of offensive street behavior with pedestrian distress has demonstrated no significant correlations.

### 5. ACKNOWLEDGMENTS

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