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DIMENSIONS OF CHALLENGES IN COMMUTING USING PUBLIC TRANSPORTATION IN DAVAO CITY

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ABSTRACT
This study explores the intricate challenges within Davao City's public transportation, aiming for a comprehensive understanding and resolution of issues impacting commuters. Examining tangible inconveniences and intangible emotional strains, the investigation focuses on financial constraints, emotional well-being, reliability, and comfort, seeking practical solutions to enhance the overall commuting experience.

Through a methodology involving the random selection of 159 Davao City commuters responding to a validated questionnaire, Exploratory Factor Analysis (EFA) identified five key factors, shaping the Dimensions of Challenges in Commuting via Public Transportation. These factors encompass Challenges and Annoyances, The Toll on Well-being and Relationships, Navigating High Costs and Emotional Toll, Challenges of Unreliable Transportation, and Comfort and Well-being in Public Transportation. Findings reveal diverse difficulties, from overcrowding to emotional stress and financial strain, visually represented in Figure 1. The study underscores the necessity for improved public transportation services, enhanced user-friendliness, and more reliable systems to positively impact efficiency, affordability, reliability, and passenger well-being, contributing to the transformation of Davao City's public transportation landscape.

Keywords:
Public Transportation, Commuter, Exploratory Factor Analysis, Overcrowding, Well-being

INTRODUCTION

Commuting significantly influences an individual's subjective well-being, which generally encompasses life satisfaction but also extends to specific domains like work and travel (Gerber et al., 2020; Olsson et al., 2013; Zhu et al., 2019; Zhu et al., 2020). Lengthy or unpleasant commutes, characterized by crowded, noisy, or polluted conditions, tend to lower subjective well-being. Rush-hour traffic adds to stress and diminishes travel satisfaction (Morris & Zhou, 2018). Longer commutes also limit time for leisure and social activities, further reducing the overall quality of life and subjective well-being (Hilbrecht et al., 2014; Nie & Sousa-Poza, 2018). Prolonged commuting negatively affects work satisfaction, life satisfaction, and physical health, contributing to inactivity (Han et al., 2022).

In the Philippines, commuting has long been a major challenge, marked by traffic congestion, unclear pickup/drop-off points, and a lack of support for pedestrians (M2.0 Communications Inc., 2022). Common issues include a deficient public transportation system, expensive fares, traffic jams, and long queues, impacting commuters' health. The extended travel duration, especially during rush hours, leads to health issues due to pollution and stress, resulting in economic losses from work tardiness. This has shaped a commuting culture emphasizing endurance, a "crab mentality," and tolerance of adversity (Fallaria et al., 2019).

Davao City faces mobility challenges due to rapid urbanization, with increased vehicle volume causing peak-hour traffic congestion (Lagumbay et al., 2018). Commuting consumes significant annual hours, affecting businesses

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and individuals' physical and psychological well-being (Koslowsky et al., 2013). Commuters in Davao primarily rely on public transportation due to the unaffordability of personal cars (Garay, 2020). While commuting may be tedious, it remains an economical means to reach workplaces, schools, and other destinations within the city. Despite these challenges, the government holds the key to addressing these issues, and despite the drawbacks, Filipinos must adapt and develop practical strategies to cope with common commuting problems (Pagkatotohan, 2022).

SCOPE AND LIMITATION

This study investigates challenges in Davao City's public transportation, focusing on tangible inconveniences and intangible emotional strains affecting commuters. Examining financial constraints, emotional well-being, reliability, and comfort, the research involves a sample of 159 respondents using a questionnaire and employs Exploratory Factor Analysis (EFA) to identify key factors shaping commuting challenges. While the findings highlight diverse difficulties, such as overcrowding and emotional stress, it is essential to note limitations, including the potential sample bias, geographical specificity, and the subjective nature of self-reported data. The study's recommendations for improved public transportation services and enhanced user-friendliness should be considered within the context of these limitations, recognizing the need for a nuanced understanding of Davao City's transportation landscape.

OBJECTIVES

The objective is to comprehensively investigate and address the multifaceted challenges associated with public transportation in Davao City, as outlined in the provided framework. This includes identifying and understanding difficulties related to commuting, emotional and practical impacts on well-being and relationships, financial pressures, and issues of reliability and comfort. The goal is to propose solutions and improvements for each dimension, aiming to enhance the overall commuting experience by promoting efficiency, affordability, reliability, and well-being for passengers in Davao City.

METHODOLOGY

This study was conducted in Davao City, with 159 commuters randomly selected to serve as research participants. The research participants were asked to respond to a questionnaire, which served as the research instrument for data collection. Experts in the field reviewed and validated the survey questionnaire. The factors were identified using the Exploratory Factor Analysis (EFA). Exploratory factor analysis is frequently used to identify the underlying factors of several observable variables (Auerswald & Moshagen, 2019). The factors were visually represented and identified using a scree plot. These factors are analyzed using content analysis techniques to develop the resilience framework.

RESULTS AND DISCUSSION

This section exhibits the analysis and interpretation of the gathered data

Kaiser-Meyer-Olkin (KMO) and Bartlett's Test. The table below presents the KMO Measure of Sampling Adequacy and Bartlett’s Test of Sphericity, crucial indicators in our research. The KMO score of .901 indicates a high level of correlation in our samples, making it suitable for analyzing variables within the dataset. Bartlett's test of Sphericity reveals a significant value of 2702.710 with a level of significance less than .001. This underscores the appropriateness of our data for identifying and addressing challenges in commuting through public transportation in Davao City.

Furthermore, the result from Bartlett’s test of Sphericity leads us to reject the null hypothesis, suggesting that there are identifiable factors contributing to the challenges in commuting using public transportation in Davao City. This strengthens our understanding of the determinants influencing the difficulties faced by commuters, providing valuable insights for further analysis and potential solutions.

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Table 1. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.901
Bartlett's Test of Sphericity	Approx. Chi-Square	2702.710
	df	435
	Sig.	.000

Scree Plot. Figure 1 provides a visual representation of the total variance explained and the Eigenvalues graph, illustrating the importance of each component. The graph showcases the gradual decline of Eigenvalues, indicating the relative significance of each factor. This visual aid is instrumental in determining the optimal number of factors to retain, particularly where the curve flattens.

Notably, the graph becomes flatter around component number 7, where Eigenvalues drop below 1. This marks a crucial point of interest, as it signifies a decline in importance. In our analysis, if the items within a dimension fall below the minimum threshold, that dimension is discarded. Consequently, we have identified and retained five factors deemed as determinants based on this analysis. This visualization aids in streamlining our focus on the most influential components, contributing to a more refined and insightful interpretation of the data.

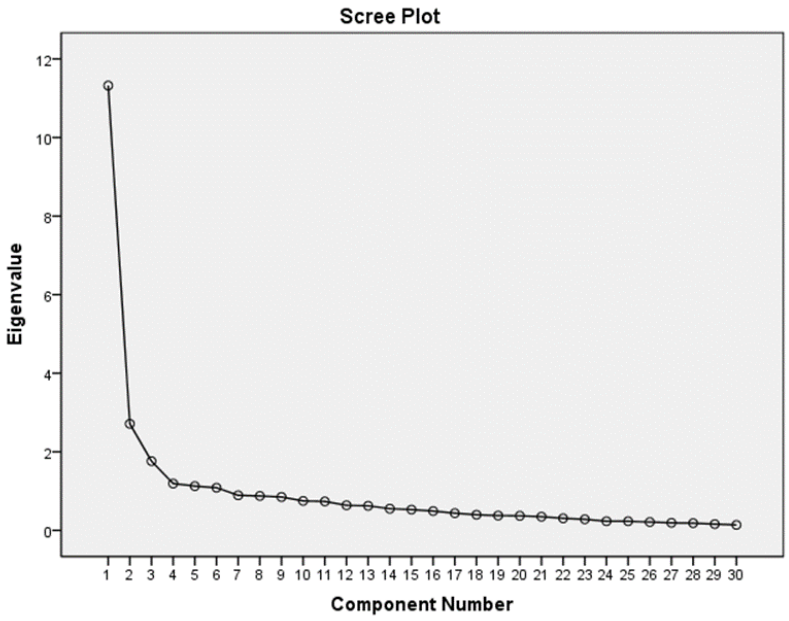

Figure 1. Scree Plot

Component Matrix

There are five factors generated using the SPSS Statistics software. Below are the factors identified based on each question's common denominator.

Table 2 presents the inconvenience as the first factor contributing to commuting challenges. Commuters face various challenges and annoyances in the public transportation system, including issues with drivers, inconvenient conditions inside the vehicles, and overall dissatisfaction with the state of public transportation in the city.

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Table 2. Rotated component matrix with grouped attributes of "Inconvenience."

Factor	Attributes	Loadings
Inconvenience	5. I find it annoying when PUJ drivers choose to exceed the vehicle's maximum seat capacity.	0.834
	26. I find it annoying when PUJ drivers prefer to stop longer than necessary in a location where no commuters wish to board.	0.819
	2. I struggled to commute during rainy seasons.	0.786
	24. I find it annoying when the walk-through inside PUJ is small and unable to walk properly	0.682
	19. I find it annoying when other passengers sit in PUJ like their own car	0.666
	27. I struggle to find vacant seats during peak hours	0.560
	28. I did not experience improvement in public transportation in my city	0.534
	29. I experienced arrogant public transportation drivers.	0.511

There is a lot of physical contact on board a jeepney. Personal space is constantly under siege (Dancel, 2016). These stressors have consequences, such as being late to an important client meeting, missing your connecting train, and accumulating tardies in your work attendance. These repercussions can trigger anxiety and other negative emotional responses (Pagkatotohan, 2020).

As presented in Table 3, the second factor is Socioemotional Impact. There is also an indirect impact of the challenges in commuting. Commuting has a negative effect on an individual's overall well-being, encompassing happiness, social life, and family life.

Table 3. Rotated component matrix with grouped attributes of "Socioemotional Impact"

Factor	Attributes	Loadings
Socioemotional Impact	30. I am not happy to use public transportation	0.725
	14. I have missed important social or family events due to commuting-related issues.	0.720
	22. My daily commuting struggles affect my ability to spend quality time with family and friends.	0.690
	23. I find no hope that my daily commute will become less challenging in the future	0.642

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	25. I am concerned about the long-term effects of my commuting struggles on my health	0.634

This revolves around the emotional and practical challenges associated with daily commuting. It highlights the overall dissatisfaction with public transportation, showcasing how commuting issues have led to the missing of significant social and family events. It amplifies limitations on personal time and reduces satisfaction with leisure time. This encompasses extended commuting durations, prolonged working hours, and responsibilities associated with raising children. (Chatterjee, K., Clark, B., Martin, A. & Davis, A., 2017).

As presented in Table 4, the challenges in commuting are also associated with the health and well-being of the commuters. The adverse effects of commuting on various aspects of life, including financial stress, emotional well-being, physical health, and overall comfort during the commute.

Table 4. Rotated component matrix with grouped attributes of "Health and Well-being"

Factor	Attributes	Loadings
Health and Well-being	13. Public transportation fares are a significant financial burden for me.	0.681
	20. The stress from my commute often spills over into my personal life.	0.602
	15. I have considered alternative modes of transportation (e.g., carpooling, and biking) due to my commuting struggles.	0.597
	11. I experience a decline in my overall emotional well-being due to my daily commute	0.552
	17. I have felt a negative impact on my physical health due to my daily commuting struggles	0.546
	18. I feel uncomfortable during my commute because of clumsy passengers and loud music.	0.527

Further, it centers on the financial strain caused by public transportation fares and the broader impact on well-being. It underscores the significant burden on personal finances, as commuting expenses take a toll. It explores stress during the journey to and from work has been a prominent explanation. Longer commute durations and more unpredictable journeys are associated with higher levels of commuting stress (Chatterjee, K., Clark, B., Martin, A. & Davis, A., 2017). It touches on the negative impacts on emotional and physical health, highlighting commuters' multifaceted challenges. Lastly, it addresses the discomfort during the commute, examining the influence of clumsy passengers and loud music on the commuting experience.

Table 5, generated the Unreliability as one of the factors of challenges in commuting. The challenges related to the reliability and timeliness of public transportation include delays, disruptions in schedules, and the negative impact on punctuality for work or appointments.

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Table 5. Rotated component matrix with grouped attributes of "Unreliability"

Factor	Attributes	Loadings
Unreliability	1. I experience delays during my public transportation commute	0.797
	4. I encounter disruptions in the public transportation schedule	0.795
	3. Overcrowding is a common issue I face during my daily commute.	0.689
	8. My daily commute negatively impacts my punctuality for work or appointments.	0.572

It revolves around the recurrent challenges faced by individuals dealing with the unreliability of public transportation. Initial investigations centered on impedance, described as commuters' challenges in traveling between home and work. Researchers initially gauged impedance in terms of travel distance or time but later honed in on travel speed to encompass the impact of congestion. Novaco, Stokols, and Milanesi (Citation 1990) distinguished between physical impedance (such as speed) and subjective impedance, which involves drivers' perceptions regarding their inability to avoid traffic, speed reductions caused by traffic jams, exposure to traffic control devices, and other aspects of the commute. (Chatterjee et. al, 2019). It also underscores how these challenges collectively negatively impact punctuality, affecting individuals' ability to meet work commitments and appointments. It sheds light on the frustration and inconvenience caused by the unpredictability of public transportation, emphasizing the need for more reliable and efficient commuting systems.

Table 6, presents Sanitation and Comfort as one of the factors. It shows that discomfort and stress factors experienced during public transportation commutes, including concerns about cleanliness, physical discomfort, and emotional stress or anxiety.

Table 6. Rotated component matrix with grouped attributes of "Sanitation and Comfort"

Factor	Attributes	Loadings
Sanitation and Comfort	10. I experience issues with cleanliness and hygiene during my commute.	0.689
	9. I am uncomfortable in my seat during my commute.	0.615
	7. I feel stressed or anxious during my public transportation commute.	0.513

It focuses on the various aspects of comfort and well-being that individuals grapple with during their public transportation commute. It addresses issues related to cleanliness and hygiene, emphasizing the need for improved conditions for passengers. The discomfort experienced at seats during the commute becomes a key point, highlighting the importance of creating a more physically comfortable environment. Additionally, the theme delves into the emotional aspect, exploring the stress and anxiety that commuters often endure during their public

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transportation journeys. It underscores the significance of fostering a more pleasant and stress-free commuting experience for the well-being of passengers. It is essential to understand if increased (or decreased) physical activity from mode changes is offset by corresponding decreased (or increased) physical activity in other activity domains (Chatterjee et. al, 2019).

Study Framework

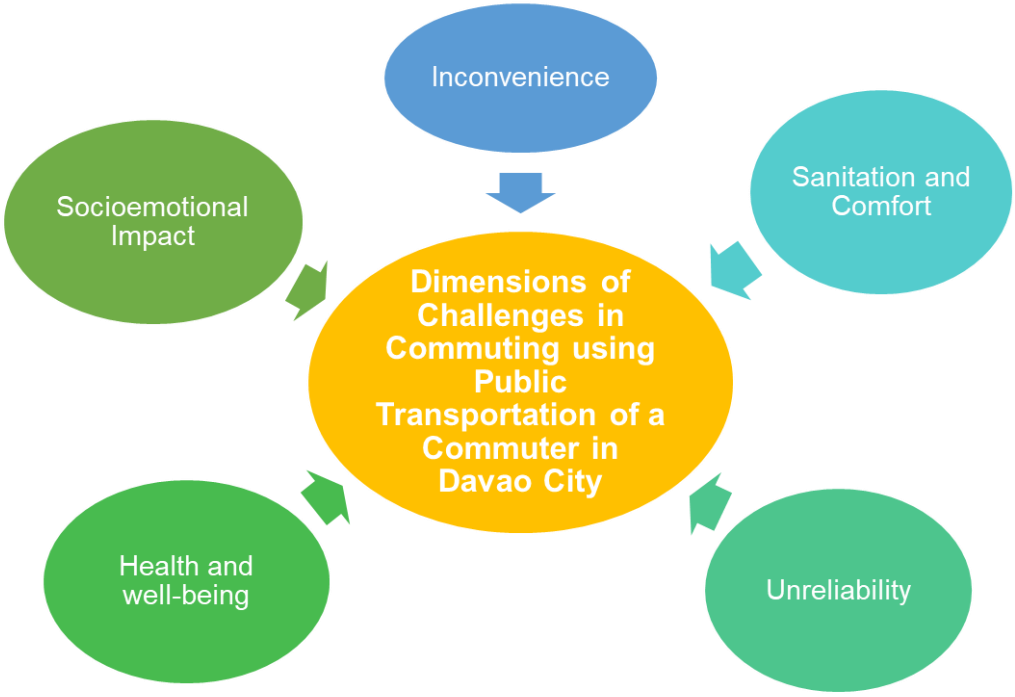

Figure 2: Factors of Dimensions of Challenges in Commuting using Public Transportation in Davao City.

This was developed based on the research findings that the study identified five factors: inconvenience, socioemotional impact, health and well-being, unreliability, and sanitation and comfort.

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CONCLUSION

Based on data findings, this research identified five key elements influencing difficulties in utilizing public transportation for commuting: inconvenience, socioemotional impact, health and well-being, unreliability, and sanitation and comfort. Each commuter faces challenges during daily commutes that impact their health and well-being. To further address a broader scope regarding the impact of these identified challenges, this study advocates for further research exploring the implications of commuting on the health and well-being of individuals in the workforce.

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