FACTORS ASSOCIATED WITH COMMUTERS' WILLINGNESS TO USE THE PUBLIC TRANSPORTATION SERVICE

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Abstract

Transportation is essential in daily life. Everyone is affected by transportation, whether directly or indirectly. Its availability influences how, where, and when we travel. Our transportation choices impact our work, leisure, and health. The daily dependence on automobiles has grown considerably in recent decades, with significant and growing environmental (e.g., greenhouse gas emissions) and health consequences (e.g., casualties). Instead of utilizing public transit, more commuters are driving. To better serve the public transit needs of the Karachi Metropolitan Area, the Karachi Circular Railway has been upgraded. The theory of planned behavior (TPB) predicted that Karachi locals would use the service because of their attitudes, perceived norms, and a sense of control. The findings indicated that perceived behavioural control had a substantial role in motivating individuals to use the Karachi Circular Railway. The results are that when residents feel they would use the Karachi Circular Railway for employment, they are more inclined to do so. The results suggest that subjective norms had no discernible influence on whether or not the Karachi Circular Railway was utilized for work-related reasons, demonstrating that this decision was made by those close to the participants who believed the Karachi Circular Railway was appropriate. The findings of this study can help Pakistani policymakers make better plans for the future enhancement of public transportation systems.

Keywords: *Public Transportation, Commuters, KCR, Theory of Planned Behaviour, Attitudes*

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INTRODUCTION

Transportation is vital in everyday life (Memon, 2018). Transport affects everyone, directly or indirectly (Memon, Kalwar, Sahito, Qureshi, & Memon, 2020). Its accessibility determines how, where, and when we travel (Memon, Madzlan, Talpur, Hakro, & Chandio, 2014). Work, leisure, and health are all impacted by our transportation choices (Kingham, Dickinson, & Copsey, 2001). The daily reliance on cars has expanded dramatically in recent decades, with significant and escalating environmental (e.g., greenhouse emissions) and health repercussions (e.g., casualties) (Ghaffar, Kalwar, Memon, Brohi, & Sahito, 2021; Memon, Napiah, Talpur, & Hakro, 2006). Commuters drive more than public transportation (Brohi, Kalwar, Memon, & Ghaffar, 2021). According to Steg (2005), commuters choose private automobiles for their feelings of power, sensation, status, freedom, and superiority. Good service can encourage commuters to use public transit (Lachapelle, Frank, Saelens, Sallis, & Conway, 2011). Understanding the commuter's needs and expectations will help attain this goal (Brohi, Memon, Kalwar, & Sahito, 2021). Previous research has shown that personal characteristics, lifestyle, journey type, and perceived service performance can influence the mode of selection (Beirão & Cabral, 2007; Kalhoro, Au Yong, & Ramendran SPR, 2021). These include reducing overall trip time, enhancing the transit availability or convenience of use, making subway travel more comfortable and relaxing, parking, pricing, fair taxi costs, and physical design and layout (Al-Rashid et al., 2021; Ali, 2010).

Much research has been undertaken recently to uncover characteristics that can minimize private vehicle use and promote public transit use in urban areas (Redman, Friman, Gärling, & Hartig, 2013). It was found that among the numerous aspects studied, service quality was important in influencing people to use public transportation. Moreover, service quality has dominated public transportation studies (Brohi, Kalwar, et al., 2021; Lai & Chen, 2011). Previous research has linked environmental concerns to public transit or car use (Kamaruddin, Osman, & Pei, 2017). In light of global warming, more excellent knowledge of the impact of more eco-friendly forms of transport, like public transportation, which emits less than private vehicles, is essential (Te & Lianghua, 2020).

In addition to the quality of service and environmental impact, attitudes are also considered a factor in people's decision to use public transportation (Suaa et al., 2022). An attitude relates to such evaluation regarding an overall opinion about favorableness or unfavourability of behaviour (Bani-Khalid, Alshira'h, & Alshirah, 2022). Consequently, customer perceptions of public

transportation services and the influence private automobiles have on the environment go hand in hand (Mugion, Toni, Raharjo, Di Pietro, & Sebathu, 2018). As a result, they are more likely to have a positive attitude about using public transportation because of their perceptions of the quality of service and the environmental impact of personal vehicles (Brohi, Kalwar, et al., 2021).

Karachi's transportation issues have worsened over the last few decades (Ahmed, Talpur, Sahito, Das, & Brohi, 2021). As pollution levels rise and air quality deteriorates, more people will suffer from respiratory and environmental problems (Gill, Kalwar, & Memon, 2021; Mangi, Yue, Kalwar, & Ali Lashari, 2020); The most vulnerable people, especially women, have seen a decrease in income and personal security as a result of this since people's means of subsistence have been curtailed to avoid long distances and labor (Hasan & Raza, 2015; Kalwar, Memon, & Qureshi, 2021). The Karachi Circular Railway (KCR), suspended operating in 1999 due to severe losses, serves only a tiny function in Karachi's urban transit system. KCR has recently been partially opened again, although the percentage of trips has not been updated yet (Brohi, Memon, et al., 2021).

Karachi Circular Railway in Karachi (KCR) is currently under development; hence, determining factors that affect the willingness to use the KCR have not been assessed. A report on consumer behaviour and its findings can assist the government and commercial sector promotes public transportation in Pakistan by analyzing customer attitudes toward the Karachi Circular Railway. This study aims to identify the factors that affect people's willingness to use the Karachi Circular Railway. The study's findings can aid Pakistani officials in developing better future strategies for improving their public transportation systems.

MATERIALS AND METHOD

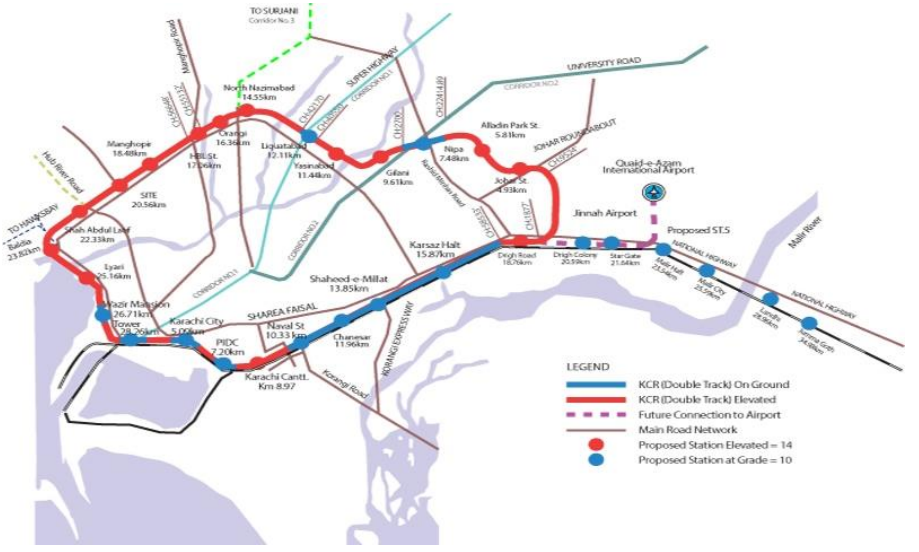
Introduction to Study Area

Karachi Circular Railway has a road network that spans 7400 kilometers and has a surface area density of 207 kilometers per 100 square miles (Qureshi & Lu, 2007). There has been a considerable increase in the problems during the use of the Public Transportation Services. An increasing number of Karachi citizens are concerned about this, which has received significant media attention (Hoor-Ul-Ain, 2019). The Karachi Circular Railway, which serves the metropolitan and suburban areas of the city, is used by an estimated 6 million passengers each year (Hasan & Raza, 2015).

In the middle of the 1980s, service decreased due to a lack of track and station development, rolling stock repair, and replacement. Thirteen years after it was discontinued in December 1999, declined service was reinstated in March 2005 (Brohi, Kalwar, et al., 2021).

On Monday, November 16, Pakistan Railways reopened a portion of the KCR between Pipri to Orangi Station. The distance between Pipri and Orangi Station is estimated to be roughly 60 km (Brohi, Kalwar, et al., 2021). Many people now rely on Karachi, their cars, and unofficial means of public transportation to get around town. Most Karachi residents regularly use informal public transportation to and from school, college, university, and employment. As a result of the Karachi Circular Railway's reopening, passengers are now using official public transit instead of unofficial public transportation. The passengers' evaluations of service quality are based on how fast and easily they can move from A to B point. These factors greatly influence whether people intend to use public transportation (Ambak, Kasvar, Daniel, Prasetijo, & Abd Ghani, 2016). Thus, this research will examine the relationship between attitudes and opinions on public transportation and their claimed intentions to use it.

Theory of Planned Behavior



The theory of planned behaviour (TPB) is employed in this study to examine the decision-making process for using the Karachi Circular Railway

(Ajzen, 1985). TPB is one of the most popular theories (Baig, Zhang, Lee, & Xu, 2022). To date, the TPB has been successfully used to measure a wide range of behaviours and preferences, from voting to smoking to driving (Baig et al., 2022; Brohi, Memon, et al., 2021). In addition, previous researchers have used different theories to explain why people choose to engage in a particular behaviour (Kalhoro et al., 2021); TPB is widely utilized to predict human behaviour (Ajzen, 1991). According to the TPB theory, using the KCR, an individual's intention to do so might be influenced by three elements (Donald, Cooper, & Conchie, 2014). The overall appraisal of the person is the effect of the behaviour included in the beliefs (attitudes) about the likely outcomes of the behaviour (positive or negative) (Ogiemwonyi, 2022). When it comes to pressure or support, subjective norms refer to how an individual feels about the anxiety or permission to engage in a particular behaviour (Brohi, Memon, et al., 2021). To determine how difficult or easy a task is, a person has a set of beliefs about the external and internal factors that might either aid or impede their decision-making (perceived behavioural control) (Ambak et al., 2016). Based on Karachi residents' attitudes, perceived norms, and sense of control, the TPB is employed in this study to predict how likely they are to use the future Karachi commuter rail system for work.

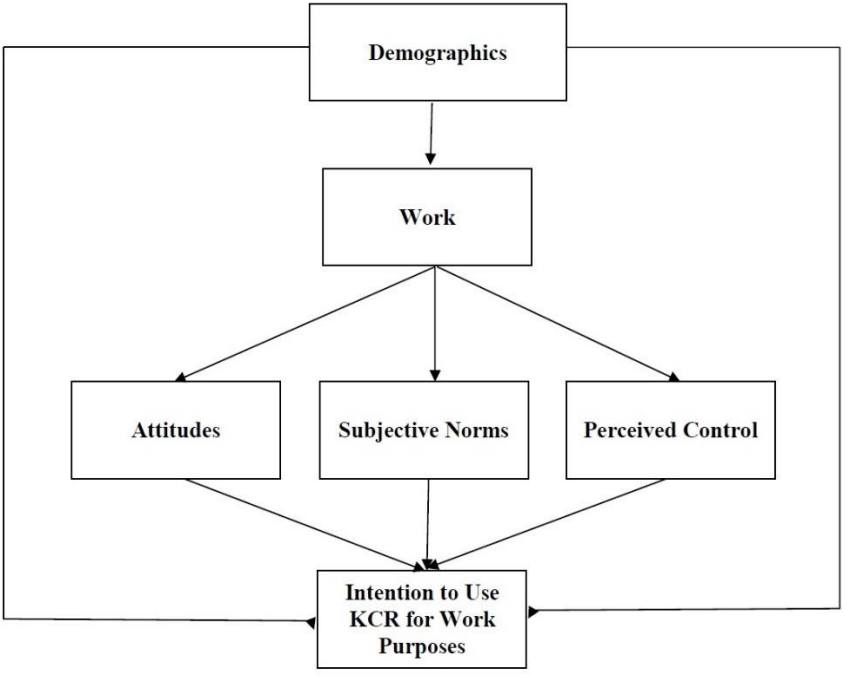


Figure 2: Theoretical Model of Research Study

DATA COLLECTION AND METHODOLOGY

This study used a random sampling method to gather data on commuters' willingness to use public transport in the study area. Random sampling (Nguyen, Shih, Srivastava, Tirthapura, & Xu, 2021) is a type of probability sampling that involves a random selection of participants and allows you to make solid statistical conclusions about the whole group of participants. According to (Ambak et al., 2016), A sample size of at least 200 is required for any multivariate statistical analysis; as a result, the research team conducted an online survey in 2021 to select a convenient sample of 500 people, who were then interviewed (Brohi, Memon, et al., 2021), Only 385 questionnaires were chosen for this study, with the remaining 23% being eliminated owing to incomplete responses. Moreover, SPSS 23.0 is used to analyze the collected data. The ordinary least-squares (OLS) regression technique is utilized to discover commuter characteristics that significantly influence their willingness to use the KCR.

RESULTS AND DISCUSSIONS

Demographics

Table 1: Demographic Characteristics

Profile	Category	Percentage (%)
Gender	Male	67.8
	Female	32.2
Age Groups	16-30 years	83.9
	31-45 years	10.9
	46-65 years	2.1
	66 or above	3.1
Education Level	Primary	0
	Secondary	1
	Higher Secondary	9.4
	Graduate	59.5
	Post- Graduate/PhD	30.1
Marital Status	Single	77
	Married	27
Year of Residence	1-2 years	42.3
	3-5 years	19.7
	6-7 years	11.4
	More than 7 years	26.5
Monthly Income	Less than 20,000	46.2
	20,001-30,000	19.5
	30,001-40,000	9.4
	40,001 or above	24.9
Employment Status	Govt. Employee	8.8
	Private Employee	40.3
	Un-Employee	17.4
	Daily Wager	1
	Student	32.5
Mode of Choice for daily purposes	Own Bike	33.8
	Own Car	28.3
	E-Hail Services	9.4
	Walking	2.1
	Public Busses	17.1

The descriptive data are shown in Table 1 which provides a summary of descriptive data in Table 1 which summarizes the respondent's demographic characteristics, including their gender, age, degree of education, occupation, monthly income, and reasons for and modes of daily public transit use. In the whole sample, men comprised 67.8% of responders, while women made up 32.2%. The average respondent's age was between 16 and 30, and 59.5 percent of them had a bachelor's degree. It also demonstrates that respondents continue to pursue education and make less than 20,000 Pakistani rupees. Karachi is an important city with many educational institutions; most people who use public transportation in Karachi are students and low-income private workers who are no older than 30.

Internal validity of each construct

The variables were generated by averaging them, as the questions were ranked from one to five. Each variable received a Cronbach's alpha coefficient, a numeric value between 0 and 1. The coefficient is 0 if the variables are fully independent. The coefficient will be correlated with one of the variables. All variables have substantial Cronbach's alpha values above Nunnally's suggested value of 0.7 (Nunnally, 1994). Table 2 shows the Cronbach alpha values for all variables.

Table 2: Internal Consistency of the variables for work purposes

Variable	Scale	Cronbach's Alpha
Work Purposes		
Intention I intend to use the KCR to go out for work purposes:	Strongly disagree (1)-Strongly agree (5)	**N/A***
Attitude For me to take the KCR for work purposes would be:	Extremely Unpleasant (1)-Extremely Pleasant (5) Extremely Bad (1)- Extremely Good (5) Extremely Negative (1)- Extremely Positive (5)	**0.87**
Subjective Norms 1- Most people important to me would support my decision to take the KCR for work purposes: 2- Most people important to me think that I should take the KCR for work purposes:	Extremely unlikely (1)- Extremely likely (5) Extremely unlikely (1)- Extremely likely (5)	**0.77**
Perceived Behavioral Control 1- For me to take the KCR to get to work would be: 2- My freedom to take the KCR to work would be:	Extremely difficult (1)- Extremely easy (5) Extremely low (1)- Extremely high (5)	**0.74**

Age as a Factor of Influence over Commuters' Willingness to Use the KCR

The respondents' ages were obtained by asking them how old they were in four age years ranges: 18-30, 31-45, 46-65, and 66 years or more. The individuals' ages were then compared to the other variables to see whether there was a correlation. Findings determine that age had a weak positive correlation with attitudes, perceived behavioural control, intention, and subjective norms regarding using the KCR for work purposes, as shown in Table 3.

Table 3: By Age, the Factors Influencing Commuters' Willingness to Use the KCR

Age	Intention	Attitude	Subjective Norms	Perceived Behavioral Control
R	0.128*	0.184**	0.092**	0.129*

R Coefficient of Correlation

* Significant at the 0.05 level (2-tailed)

** Significant at the 0.01 level (2-tailed)

Gender as a Factor of Influence over Commuters' Willingness to Use the KCR

Males and females were compared on their intention, attitude, subjective norms, and perceived behavioural control using independent sample t-tests. Men and women differed significantly on the work-related questions. As indicated in Table 4, only attitudes towards using KCR were more effective in males than in females, but not perceived behavioural control, intentions, or subjective norms.

Table 4: By Gender, the Factors Influencing Commuters' Willingness to Use the KCR

	Gender	N	Mean	Std. Deviation	Std. Error Mean	t
Work Purposes						
Intention	Male	261	3.35	1.38	0.085	0.641
	Female	124	3.25	1.46	0.131	
Attitude	Male	261	3.74	1.00	0.062	3.599
	Female	124	3.35	0.97	0.087	
SN	Male	261	3.60	1.00	0.062	1.596
	Female	124	3.42	0.98	0.088	
PBC	Male	261	3.47	0.980	0.060	-0.537
	Female	124	3.53	0.973	0.087	
SN= Subjective Norms PBC= Perceived Behavioral Control						

OLS Regression Model

In order to better understand the variables that significantly impacted commuters' willingness to use the KCR service, ordinary least-squares (OLS) regression is used in this research study. The regression model's functional form is as follows:

Intention to use the KCR= $\beta 0\ \beta 1\ X + \varepsilon$

Where $\beta 0$ is the y-intercept and $\beta 1$ is the X coefficient of the independent variable.

The intention to use the KCR was predicted using OLS regressions.

In the initial regression stage, gender and age do not affect the intention to use KCR for work purposes. After then, TPB-related factors were investigated. The findings demonstrate that attitudes considerably influence the persons' intention to use KCR. On the other hand, subjective norms and perceived behavioural control did not reveal the same pattern of findings. People's intentions to use the KCR were unaffected by subjective norms. Furthermore, the R2 (0.463) result indicates that the model explains 46.3 percent of the variation in the variables.

Table 5: Work Regression Model

Model	Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Work Regression Model		B	Std. Error	B		
1	(Constant)	-1.345	0.431		-3.121	.002
	Age	0.113	0.091	0.052	1.234	.218
	Gender	0.144	0.118	0.048	1.216	.225
	Native Residancy	0.068	0.126	0.022	0.543	.588
	Employment	0.086	0.042	0.088	2.073	.039
	Attitude	0.571	0.072	0.410	7.898	.000
	SN	0.302	0.091	0.216	3.318	.001
	PBC	0.233	0.085	0.162	2.748	.006
Model	R	R^2	Adjusted R^2	Std. Error of the Estimate		
1	0.680	0.463	0.453	1.03963		

SN= Subjective Norms

PBC= Perceived behavioural control

CONCLUSION

The purpose of this research is to see whether people's attitudes and opinions about using the KCR match their quantified intentions. A weak positive correlation was found between age and attitude, perceived behavioural control, and subjective norms about using the KCR for professional goals in the descriptive analysis; this could suggest that people between the ages of 31 and 45 have a positive attitude toward using the KCR for work, think others expect them to do so and believe they have control over their sense for using the KCR.

It is more common for men to use the KCR at work because of their favorable attitudes, the backing of their coworkers, and their perception that they have the freedom to use or not use it. According to the study, changing passengers' attitudes is essential to using the KCR. Passengers considering utilizing the KCR for work needed perceived behavioural control, suggesting they are more likely to do so. Subjective norms shaped how individuals utilized the KCR. It implies that those close to the participants determine

whether or not to utilize the Karachi Circular Railway for employment.

Consequently, future studies should identify the obstacles commuters feel prohibit them from using the KCR for work. Walking in this area is complicated by several factors, including the climate, culture, and infrastructure (Qureshi & Lu, 2007). Better sidewalk infrastructure for corridors and the areas around KCR stations as well as nearby parking facilities are some proposals as a consequence. Because of their efforts, more individuals may be convinced to utilize the Karachi Circular Railway. Karachi authorities and decision-makers may use this information to understand better.

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