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## RESEARCH ARTICLE

### Transport Poverty: A Comparative Study between South Africa and Nigeria

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#### Abstract:

#### Background:

Achieving the Sustainable Development Goals (SDGs) and neighbourhood liveability is dependent on an improved transportation sector. Urban transport is conceptualized as either mobility or accessibility; thus, it remains an integral part in enhancing urban livelihood and serves as a hub connecting all sectors of a city's economy. Lack of access to opportunities and/or services, inadequate transport services, and physical or financial inaccessibility to transport options are prevailing in African cities and have been used to conceptualize transport poverty.

#### Objectives:

This study seeks the relationship between some dimensions of transport poverty and life satisfaction. The argument put forward in this study is that transport poverty predicts life satisfaction that is a vital aspect of subjective wellbeing.

#### Methods:

The study utilise an exploratory, comparative design that will enable the comparison of dimensions of Transport Poverty in Ibadan, Nigeria, and Durban, South Africa. For this study, communities in both Ibadan and Durban were randomly selected; while data were collected through an online survey method. The hypothesis that spatial exclusion mediates the relationship between service availability and satisfaction with life, transport disadvantaged and satisfaction with life, and transport reliability and satisfaction with life were tested through mediation analysis.

#### Results:

For the first hypothesis, partial mediation existed; for the second hypothesis, no mediation existed; for the third hypothesis, total mediation existed. Lastly, spatial exclusion varied between the two countries.

#### Conclusion:

The study concludes that a transport network that is not reliable leads to spatial exclusion, which in turns affects satisfaction with life. Likewise, all dimensions of transport poverty are similar except for spatial exclusion which differs between the countries, with South Africans experiencing more cases of spatial exclusion as compared to Nigerians.

**Keywords:** Quality of life, Transport experience, Accessibility, Affordability, Perception, Comparative analysis.

#### Article History

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## 1. INTRODUCTION

Transportation infrastructure investments are considered key to promoting economic growth [1]. Its relevance is within the geographical connection of places of economic activities and livelihood. Popoola *et al.* [2] iterate that transportation is the most important factor through which other sectors of the

economy flourish. This is because it enhances the flow of goods and supply chain [3 - 5], services [6], and facilitates humans [7]. To this end, it was identified that improved mobility and transportation were critical to 21<sup>st</sup> century urbanism [8]. The view was that transportation-related social exclusion negatively influenced the distributional aspects of accessibility [8] of societies.

This limitation in access and mobility [9] are the

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characteristics that shape Southern Africa's transport planning. In the study, increased focus on mobility rather than accessibility, investment in road-based transport rather than public transport, and lack of emphasis on spatial quality in transportation planning were reported to be over-emphasised. Dewar [9] documented the unsustainable transport condition across urban areas in the region. To ease this negative transport experience, Dewar [9] advocated for transport and mobility restructuring of urban societies towards efficient, and equitable system that supports intra-urban mobility and accessibility for all. For instance, Dewar [9] described high dependence on private mobility in Southern Africa resulting into high households transport expenditure, direct fuels households spatial exclusion and transportation poverty. McKay *et al.* [10] reported that cities residents' dependence on private mobility have contributed to traffic congestion and an 'ethno-social' transport poverty and segregation among the urban disadvantaged in South Africa. The argument was that limited private car ownership affordability exposes resident to marginalisation, increasing social inequality and reducing a sense of common community [10, 11], all of which shape resident life satisfaction. Iterating the environmental, economic and social burden that is associated with transport pressure from private car ownership in Tunisia, the authors [12] reported the external costs of transport to the well-being through carbon emission evaluation. The study suggested the move towards mass-transit as against private car ownership and mobility.

The conceptualisation and application of the concept of transport poverty remains multi-dimensional and multi-sectoral. Transport poverty, according a study [13], is the inability to meet an individual transportation need. The view was that poverty of transport, also termed mobility; accessibility poverty [14] or transportation exclusion is more personal and experience based (*Ibid*). In providing a narrative to their own assertion, authors in a study [13] argue that mobility and accessibility of consumer goods and activities as a part of the transportation process are highly social, temporal, and geographical. Thus, making it more difficult to construct a single definitive indicator of mobility or transport poverty.

This presents the idea that transport poverty can encompass a poor state of physical infrastructure [15 - 18], inadequate transport mode or diversity of transport modal choice [19 - 21], poor level of accessibility for goods, services and human activities [13, 16], individual inability to afford [22 - 24] and/or complete exposure to various transport externalities [24 - 26]. This was why it was claimed that the transport poverty term is vast, dynamic, place-based, people defined and a combination of various transport subsets.

Adeyinka [23], who investigated the relationship between transportation costs and poverty in Nigeria, said that the subset of poor infrastructure quality, poor accessibility, and limited model choice might be used to conceptualise urban transport poverty in Nigeria. Issues around inaccessibility, poor and unsatisfactory transport service delivery among public transport operators have been reported by urban commuters and residents in Nigeria [23 - 50]. This experience is often limited to households that depend on only public transport for

mobility. It was further reinforced that household's income is a determinant factor in the choice of transport mode. This is because the transport choice in Nigeria can be classified as private and public. The experience is that high income class is more on private vehicles while the low income use public buses, commercial motorcycles often resulting in trekking as a complimentary transport mode from one location to another. Among rural dwellers of Taraba State, Nigeria, high transportation costs were revealed to have a positive correlation with poverty [27]. In fact, Ighodaro [28] mentioned that poverty of transport is due to the poor state of roads. It was even advocated that away from new road development, improving and maintaining the quality of the existing ones is key to boosting the economic growth of the nation.

Delbosc [29] further reported that despite the relationship that exists between well-being, quality of life, happiness and transport system, there is less research that establishes the roles of transport towards satisfaction. Reardon and Abdallah [30] queued that the relevance of transport to well-being is traced to the understanding that transport is a part of the human system. The humanistic dimension of transport was why studies have [31 - 33] identified the role traffic congestion plays on the mental and economic satisfaction of people. In the role of transport on elderly people of Ibadan, Nigeria, the authors [34] emphasised that vehicle design, long access and waiting time as well as poor facilities at the terminals were identified as constraints to the effective mobility of the elderly. The conclusion was the mobility crisis and transport burden were a peculiar well-being experience of elderly persons in the study area.

In fact, this transport burden was also identified amongst people with disabilities (PWD) in Nigeria [35]. Ettemma *et al.* [36] reported that travel experience and travel satisfaction, mindset and traveler's behavior are interrelated. Blamah *et al.* [37] reported on the need to improve traveler experience and satisfaction in public mass transit as means of managing transport poverty and positive mobility behavior. In Africa, Porter [38] mentioned that the region's persistent development problems, poverty and general poor rural livelihood conditions can be improved through proper transport investment. The position was that the transportation system can increase productivity and effective distribution in the long run increasing the economic growth [39] and sustainable economic development [40] of Nigeria. The question asked in this study is how much transportation poverty contributes to the well-being of residents in Africa.

This is the view that connecting places depend on an effective transport system. The capacity of the transport system to perform this function is key to accessibility, ease of mobility and life satisfaction. Despite this, transport exclusion still exists amongst people of various classes and socio-economic gradients. The question asked in the study is, do people's transportation experiences define their quality of life? In South Africa, studies [41 - 44] reported that the historical urban segregation and exclusion from the apartheid urban planning has continually limited the quality of life in South African cities. The segregated experience has been reported to manifest in economic, spatial and social marginalisation and

disadvantage. To have a balanced experience (as relating to life satisfaction and transport quality), study [44] forwards the need to locate low-income housing close to employment centres to give marginalised groups access to employment opportunities at the lowest transport cost and improve housing affordability. This evidence poses the underlying question of transport cost and access in South Africa as it relates to 'increased' poverty experience or livelihood shock.

Going by the characteristics evidenced by the study [9], the Southern Africa transport system is characterised by less accessibility, investment in road-based transport and poor spatial quality; coupled with the reported assertions [23] in Nigeria that increasing investments by public government in road infrastructures did not take into consideration space quality and accessibility, the study was interested in a comparative analysis for evidence based findings on the level of poverty of transportation in South Africa and Nigeria. As the gap in transport and life satisfaction was identified [30], one of the objectives of this study is to add to this new paradigm literature of modeling the role of transport in the well-being of Nigeria and South African citizenry. Lucas *et al.* [13] reported the gap in the literature on transport poverty studies in Global South. Churchill and Smyth [18] reported the prevalence of transport poverty remains a key policy concern not just in developed countries but in the Global South. This is further bolstered [42, 45] that increased transport poverty related study is key to achieving economic quality of life and satisfaction. The view is that there exists a nexus between economic quality of life, transport poverty and policy introduction.

## 2. THEORETICAL AND RELATED LITERATURE

### 2.1. Theorizing Transport Poverty and Wellbeing in the context of Transport System and Social Exclusion Theory

The first mention of social exclusion [46] was in the era of Aristotle. Other writings about the concept were from French literature from the 1960s [47]. The dimensions of the application of exclusion were from the monetary and economic limitations among certain classes of people (called 'excluded') [48]. Similarly, Masse [49] used the term exclusion to describe people surviving on the very edge of a prosperous society who do not participate in the division of the fruits of economic progress. It was [50] averred that from the mid-1960s to 1970s this term was used for the description of an individual life failure, strikingly contrasting with the increasing prosperity of the rest of the society, thus terming it to mean poverty and marginality. The concept has been used synonymously and interchangeably in literature [51]. Church *et al.* [52] identified that exclusion can be physical, geographical, economic, time-based, fear-based, space, and facility.

United Nations Development Programme (UNDP) [16] stated that exclusion could be translated as non-discrimination or restriction clause, based on any ground of socio-demographic, economic or physical characteristics. Exclusion as a concept is aimed at eliminating spatial segregation, marginalization and discrimination [51]. Based on the conceptualisation of transport poverty (mobility and accessibility) and how it translates into improved well-being, transport exclusion is seen from the context of physical,

geographical, facilities, economic and time-based exclusion. The concept of exclusion can be applied to the field of planning in various ways, and these include the fact that knowledge of the concept of exclusion assists the planners to understand the livelihood pattern of the community that a plan is made for and understanding the appropriate scale of poverty measurement in a spatial dimension.

Transport is a significant factor in social exclusion [53]. In a synopsis on the link between transport and social exclusion in South Africa, the authors [54] wrote that inadequate transport which has an indirect resultant effect to unemployment has been a contributing factor to people's continued poverty and social exclusion. The argument was that an unsafe, unreliable and uncomfortable public transportation system generated more origin to destination travel time for some dwellers and in some places (inner cities and rural areas), inadequacy in access is what characterised their transport system. Birchall [55] reported that exclusion in access transport and building facilities among people living with disabilities (PLWDs) is common in Nigeria. It was reported that up to 80 percent of PLWDS in Nigeria are reliant on public transport, yet vehicle design and road environments prevent public transport from being accessible [55]. Wapling [56] stated that social exclusion among PWD can be environmental, institutional or attitudinal.

The argument by Mackett and Thoreau [53] was that the exclusion dynamics experience can be a result of transport generated externalities for various groups. As a result of this, a study [55] advocated the protection of the rights of the physically challenged persons to unhindered mobility through the removal physical and structural accessibility barriers. As a wide range of transport policies can help arrive at a socially inclusive and quality living condition. This is because through transport inclusion, better access to opportunities [56 - 58] is achieved for the people, which results in improved well-being. The use of concept of well-being is multi-dimensional; it is often used interchangeably with concepts such as transport externalities, quality of life, happiness, life satisfaction and good life [30, 57 - 59].

The International Network for Transport and Accessibility in Low Income Communities (INTALInC) [60] reported that transport defines exposure to inequality and opportunities. The view was that the availability, accessibility, efficiency and quality of public transport are crucial determinants of physical and socio-economic vulnerability among urban residents [61]. Without adequate and affordable public transport to outlying housing areas and housing settlements along city peripheral, people's well-being and livelihood will be negatively impacted [60]. Ipingbemi and Akogun [62] conceptualised the importance of transport within the socio-economic development context and submitted that transport is central to the achievement of Sustainable Development Goals (SDGs), especially in developing nations. This is because access to complimentary infrastructures and reduction in household expenses is indirectly linked to improved transport investment [63].

Concluding this section, Lucas [13] pointed that poor transport conditions in the country are the triggering factor for over-reliance on walking. This experience avers the dynamics

of well-being as modeled by Foresight Mental Capital and Well-being Project [64] (Fig. 1). Figure 1 also shows that the sense of living as in satisfaction is associated with numerous externalities. One of such is the psychology of transport reinstated by Schlag and Jen [65]. It was mentioned that the relation between behaviour and accidents, transportation psychology, focuses on mobility issues, individual and social factors in the movement of people and goods, and travel demand management [65].

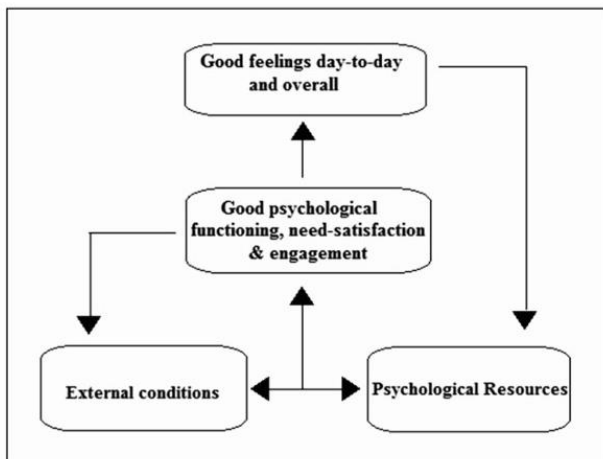


Fig. (1). Dynamic Model of Well-being.  
Source: Foresight Mental Capital and Well-being Project [64]

3. METHODS

The study took into consideration the respondents' transport and mobility experience. The study is based on multiple non-probabilistic sampling techniques of purposive, convenient and snowballing technique. Data were collected using an online survey google form sent to residents in Ibadan and Durban city of Nigeria and South Africa, respectively. The

sample technique allowed for a selected sampling. Data collection targeted respondents that were above 18 years of age. This allowed for city (study setting) to be achieved. All the sampled respondents and information and communication technology (ICT) inclined with individual or group and family collective daily mobility and transport demands or supply with Ibadan and Durban. A total of 295 respondents completed the survey *i.e.*, 202 from Nigeria and 93 from South Africa. The low response rate in Durban, South Africa, can be attributed to the data cleaning process and mobility restrictions in the country when the data was collected. Data were collected during the first wave (July 2020 and Mid-March 2021) of the COVID-19 pandemic in South Africa. Also, about 127 respondents in Durban, South Africa submitted their responses; however, after data cleansing, only 93 were considered fit for analysis.

Data were collected through an online survey. It consisted of six items, each representing transport disadvantaged, transport service availability, transport reliability (Table 1) [66, 67]. In addition, the survey included five items that focused spatial exclusion and finally, five items that focused satisfaction with life [68]. A total of 295 respondents completed the survey *i.e.*, 202 from Nigeria and 93 from South Africa.

Mediation analysis [69] was conducted to assess if the mediator variable mediated the relationship between independent variable and dependent variable. Consequently, a series of regressions were conducted to assess mediation [70 - 74]. First, a linear regression was used to assess independent variable (X) as a predictor of dependent variable (Y). Secondly, a linear regression was used to assess independent variable (X) as a predictor of the mediator (M). Thirdly, a multiple regression was used to test the independent variable (X) and mediator (M) as predictors of dependent variable (Y). Fig. (2) summarizes this process.

Table 1. Indicator Codes for the variable construct.

Indicator Code	Indicator
<b>Transport Service Availability</b>	
1	Covering the costs of your transport (fuelling your car inclusive for car drivers)
2	Getting to places quickly
3	Finding transport so you can commute
4	Being able to commute when you want to
5	Having to rely on others for transport
6	Being able to get around reliably
<b>Transport Disadvantaged</b>	
1	Being able to physically get onto transport modes
2	Transport modes being available at night
3	Transport modes being available at weekends
4	Transport modes operating frequently
5	Being able to get to bus/taxi stops
6	Being able to make connections between various transport modes
<b>Transport Reliability</b>	
1	Being able to get travel information about public transport
2	Feeling safe when commuting on your own
3	Needing help to get around the city/town on your own

(Table 1) contd.....

Indicator Code	Indicator
4	Being able to understand/navigate wherever you go to in the city/town
5	Finding the time to travel when you need to
6	Finding someone to provide assistance when transport is available
<b>Spatial Exclusion</b>	
1	Degree of satisfaction with transport service in your neighbourhood
2	Degree of satisfaction with road quality in your neighbourhood
3	Degree of satisfaction with level of employment opportunities in your neighbourhood
4	Degree of satisfaction with the level of social services in your neighbourhood
5	Degree of satisfaction with the presence of government in your neighbourhood in terms of development
<b>Satisfaction with Life</b>	
1	In most ways, my life is close to my ideal
2	The conditions of my life are excellent
3	I am satisfied with my life
4	So far I have gotten the important things I want in life
5	If I could live my life over, I would change almost nothing

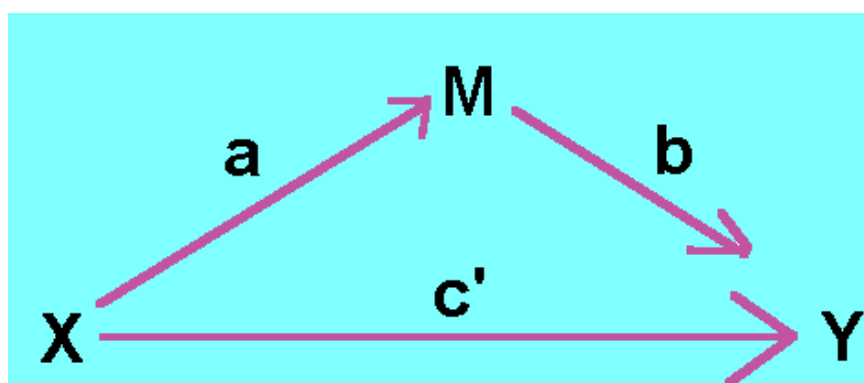


Fig. (2). Mediation analysis with M mediating the relationship between X and Y using the guidelines of Baron and Kenny [69].

Y= Transport Service Availability + Transport Disadvantaged + Transport Reliability

X= Satisfaction with Life

M= Spatial Exclusion

Mediation was established through examination of the three regressions in the paragraph above. Thus, for mediation to be supported, four criteria must be met [69]. First, there must be a relationship between the independent and dependent variable; secondly, a significant relationship must exist between the mediator and the independent variable; thirdly, a significant relationship must exist between the mediator and the dependent variable, with the independent variable present in the same model; and lastly, in the model which has the independent variable and mediator, the independent variable should no more predict the dependent variable. However, partial mediation occurs when the independent variable's influence on the dependent variable is reduced when the mediator is controlled for (the coefficient is different from zero but the absolute size is reduced). Statistical results were interpreted using a significance level of  $p < .05$ .

Thus, the following mediation was tested;

(I) Spatial Exclusion mediated the relationship between

Service availability and Satisfaction with Life,

(II) Spatial Exclusion mediated the relationship between Transport Disadvantaged and Satisfaction with Life,

(III) Spatial Exclusion mediated the relationship between Transport Reliability and Satisfaction with Life.

In addition, statistical test of difference was conducted on the various dimensions of transport poverty between Nigeria and South Africa.

#### 4. RESULTS

First, the regression with service availability predicting satisfaction with life was conducted. The relapse of satisfaction with life on service availability was significant,  $F(2, 253) = 41.87, p < .001$ . The results showed that service availability was a significant predictor of satisfaction with life,  $B = 0.84$ , indicating that the first criterion for mediation was satisfied. Thereafter, the regression with service availability predicting spatial exclusion was conducted. The regression of spatial exclusion on service availability was significant,  $F(2, 253) = 51.86, p < .001$ . The results showed that service availability was a significant predictor of spatial exclusion,  $B = -0.42$ , indicating that the second criterion for mediation was satisfied. Next, the regression with service availability and spatial

exclusion predicting satisfaction with life was conducted. There was a substantial relationship between service accessibility and geographical exclusion and overall life satisfaction,  $F(3, 252) = 30.44, p < .001$ . The individual predictors were examined further. The results showed that spatial exclusion was a significant predictor of satisfaction with life when service availability was included in the model,  $B = -0.55$ , indicating that the third criterion for mediation was satisfied. The results showed that service availability was a significant predictor of satisfaction with life when spatial exclusion was included in the model,  $B = 0.61$ , indicating that the fourth criterion for mediation was not satisfied. Since criterion 1 and 2 were met, while criterion 3 was not met, thus, partial mediation was supported. The results of the mediation are presented in Table 2.

To test the second hypothesis, first, the regression with transport disadvantaged predicting satisfaction with life was conducted. The regression of satisfaction with life on transport disadvantage was not significant,  $F(2, 248) = 3.60, p = .059$ . The results showed that transport disadvantage was not a significant predictor of satisfaction with life,  $B = 0.27$ , indicating that the first criterion for mediation was not satisfied. Second, the regression with transport disadvantaged predicting spatial exclusion was conducted. The regression of spatial exclusion on transport disadvantage was significant,  $F(2, 248) = 25.70, p < .001$ . The results showed that transport disadvantage was a significant predictor of spatial exclusion,  $B = -0.31$ , indicating that the second criterion for mediation was satisfied. Next, the regression with transport disadvantage and spatial exclusion predicting satisfaction with life was conducted. The regression of satisfaction with life on transport disadvantaged and spatial exclusion was significant,  $F(3, 247) = 17.90, p < .001$ , suggesting that transport disadvantage and spatial exclusion accounted for a significant amount of variance in satisfaction with life. The individual predictors were examined further. The results showed that spatial exclusion was a significant predictor of satisfaction with life when transport disadvantage was included in the model,  $B = -0.78$ , indicating that the third criterion for mediation was

satisfied. The results showed that transport disadvantage was not a significant predictor of satisfaction with life when spatial exclusion was included in the model,  $B = 0.03$ , indicating that the fourth criterion for mediation was satisfied. Since criterion 1 on this hypothesis was not met, mediation cannot be supported. The results of the mediation are presented in Table 3.

For the third hypothesis, the regression with transport reliability predicting satisfaction with life was conducted first. The regression of satisfaction with life on transport reliability was significant,  $F(2, 253) = 17.85, p < .001$ . The results showed that transport reliability was a significant predictor of satisfaction with life,  $B = 0.58$ , indicating that the first criterion for mediation was satisfied. Second, the regression with transport reliability predicting spatial exclusion was conducted. The regression of spatial exclusion on transport reliability was significant,  $F(2, 253) = 62.46, p < .001$ . The results showed that transport reliability was a significant predictor of spatial exclusion,  $B = -0.46$ , indicating that the second criterion for mediation was satisfied. Next, the regression with transport reliability and spatial exclusion predicting satisfaction with life was conducted. The regression of satisfaction with life on transport reliability and spatial exclusion was significant,  $F(3, 252) = 20.77, p < .001$ , suggesting that transport reliability and spatial exclusion accounted for a significant amount of variance in satisfaction with life. The individual predictors were examined further. The results showed that spatial exclusion was a significant predictor of satisfaction with life when transport reliability was included in the model,  $B = -0.68$ , indicating that the third criterion for mediation was satisfied (which infers that a one unit increase in the mean value of spatial exclusion will reduce the mean value of satisfaction with life by 0.68 units). The results showed that transport reliability was not a significant predictor of satisfaction with life when spatial exclusion was included in the model,  $B = 0.27$ , indicating that the fourth criterion for mediation was satisfied. Since all criteria were satisfied, complete mediation is supported. The results of the mediation are presented in Table 4.

**Table 2. Mediation Results for Satisfaction with Life predicting Service availability mediated by Spatial Exclusion.**

Dependent	Independent	B	SE	t	p
Regression 1:					
Satisfaction with Life	Service availability	0.84	0.13	6.47	< .001
Regression 2:					
Spatial Exclusion	Service availability	-0.42	0.06	-7.20	< .001
Regression 3:					
Satisfaction with Life	Service availability	0.61	0.14	4.40	< .001
	Spatial Exclusion	-0.55	0.14	-4.06	< .001

**Table 3. Mediation Results for Satisfaction with Life predicting Transport Disadvantaged mediated by Spatial Exclusion.**

Dependent	Independent	B	SE	t	p
Regression 1:					
Satisfaction with Life	Transport Disadvantaged	0.27	0.14	1.90	.059
Regression 2:					

(Table 3) contd.....

Dependent	Independent	B	SE	t	p
Spatial Exclusion	Transport Disadvantaged	-0.31	0.06	-5.07	< .001
Regression 3:					
Satisfaction with Life	Transport Disadvantaged	0.03	0.14	0.19	.851
	Spatial Exclusion	-0.78	0.14	-5.64	< .001

Table 4. Mediation Results for Satisfaction with Life predicting Transport Reliability mediated by Spatial Exclusion.

Dependent	Independent	B	SE	t	p
Regression 1:					
Satisfaction with Life	Transport Reliability	0.58	0.14	4.23	< .001
Regression 2:					
Spatial Exclusion	Transport Reliability	-0.46	0.06	-7.90	< .001
Regression 3:					
Satisfaction with Life	Transport Reliability	0.27	0.15	1.84	.067
	Spatial Exclusion	-0.68	0.14	-4.71	< .001

Table 5. Two-Tailed Independent Samples t-Test for Dimensions of Transport Poverty by Country.

Variable	Nigeria		SA		t	p	d
	M	SD	M	SD			
TSA	2.89	0.72	2.85	0.78	0.44	0.662	0.05
TD	2.84	0.7	2.95	0.86	-1.16	0.249	0.14
TR	3.02	0.73	3.05	0.72	-0.3	0.766	0.04
SE	1.5	0.54	2.34	0.86	-9.8	< .001	1.17

A two-tailed independent samples *t*-test was conducted to examine whether the mean dimensions of transport poverty (transport service availability (TSA), transport disadvantaged (TD), transport reliability (TR), spatial exclusion (SE) were significantly different between the Nigeria and SA Country of residence. TSA was not significantly different between Nigeria and South Africa,  $t(285) = 0.44, p = .662$ . Similarly, the finding suggests the mean of TD was not significantly different

between the countries,  $t(281) = -1.16, p = .249$ . Likewise, the finding suggests that the mean of TR was not significantly different between the countries,  $t(287) = -0.30, p = .766$ . However, exclusion was significantly different between the two countries,  $t(267) = -9.80, p < .001$ . This finding suggests the mean of SE was significantly different between the Nigeria and SA categories of country of residence. The results are presented in Table 5. A bar plot of the means for spatial exclusion is presented in Fig. (3).

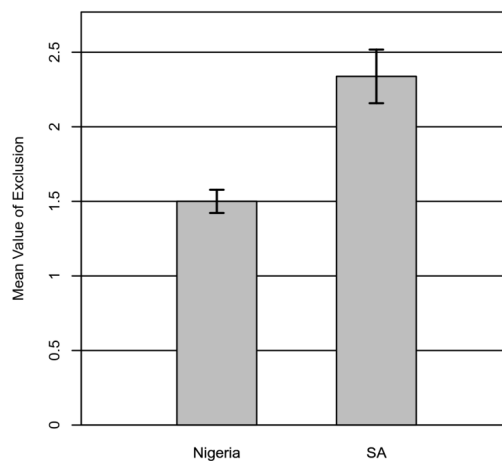


Fig. (3). The mean of Spatial Exclusion by Countries.

## CONCLUSION

The hypothesis that spatial exclusion mediated the relationship between service availability and satisfaction with life was not met. However, partial mediation existed. This infers that the direct causal path between service reliability and satisfaction with life was reduced in absolute size but different from zero (0) when spatial exclusion was introduced into the model. In other words, there is a significant relationship between service availability and satisfaction with life. This means that spatial exclusion accounts for some, but not all, of the relationship between service availability and satisfaction with life. Furthermore, the hypothesis that spatial exclusion mediated the relationship between transport disadvantaged and satisfaction with life was not met; there was no form of mediation. In addition, the hypothesis that spatial exclusion mediated the relationship between transport reliability and satisfaction with life was met. Consequently, transport reliability no longer affects satisfaction with life directly after controlling for spatial exclusion. This infers that a transport network that is not reliable that leads to spatial exclusion, which in turn affects satisfaction with life. Lastly, all dimensions of transport poverty are similar except for spatial exclusion, which differs between the countries, with South Africans experiencing more cases of spatial exclusion when compared to Nigerians.

Alluding to the livelihood struggle in South Africa, Popoola *et al.* [75] reported the effect of ‘weak and poor’ governance and its associated outcome (service delivery access) on the quality of life among urban residents. In addition, unaffordable transportation costs and lack of access to the public transportation network further limits access to economic opportunities [42]. In the same regard, Maswime [76] reported on the politicisation and spatial injustice that is associated with road planning within the country. The argument of inherent road infrastructure exclusion was along the urban-peri-urban neighbourhood satisfaction. In his view, it was bolstered that the disparity in access to resources, viz-a-viz life satisfaction and quality is geographically defined. The geography of which is influenced by access and connectivity (road quality and condition, and transport affordability). All of which within the spatial justice agenda can define the exclusion or inclusion of residents.

In the apartheid political footprint within urban fabric, Totaforti [42] mentioned the irregular development and city sprawling remains on the deep socio-spatial divisions that defined urban contexts at the end of apartheid. This remains an underlying limitation to neighbourhood (within the city) life quality. Westaway [77] emphasised that the low level of satisfaction is also due to the public transport, unemployment, and ‘irresponsive’ local government and also presented a racial (black or white suburbanites) difference in transport satisfaction. The dissatisfaction was due to the unavailability of public transport during off peak hours, street safety (robbery and street lighting), and poor road condition due to lack of maintenance.

## LIST OF ABBREVIATIONS

**SDGs** = Sustainable Development Goals

**UNDP** = United Nations Development Programme

**ICT** = Information and Communication Technology

## CONSENT FOR PUBLICATION

Not applicable.

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## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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