

Determination of Factors Influencing Users' Satisfaction with Urban Green Open Spaces in a sub-Sahara African City – Evidence from Enugu, Nigeria

Abstract

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This study determined the factors that influence urban green open space users' satisfaction with open spaces in Enugu urban, south-east Nigeria. The data were derived from a questionnaire survey of 394 open space visitors and analyzed using descriptive, principal component, and multiple linear regression analyses. The results revealed that the participants understood the factors that influenced their satisfaction with the parks in eight key dimensions: accessibility to the green open spaces, conveniences, safety and security concerns, emotional attributes, aesthetics, physical facilities/ services attributes, scenery attributes and parks' management/maintenance. This understanding of open space users' satisfaction would inform urban planners of the strategies for effective planning and provision of friendly open spaces that will encourage the urban residents to enjoy the multifunctional benefits of such facilities in Nigerian cities and beyond. Additionally, it contributes to the enhancement of the planning and development of green open spaces in African cities, ensuring they are more tailored to the unique requirements of their inhabitants

Keywords: Users' satisfaction; Parks; Survey, Urban areas

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Introduction

The need to pursue adequate provision of urban green open space by urban planners and governments of various countries of the world for the well-being of the citizens as well as the environment has been imminent. This pursuit which has been long-dated stemmed from the utopian plans of Owen Robert, then transcended to studies of Ebenezer Howard till the current regulations for the provision and development of urban green open spaces in urban areas. The UN (2014) report stated that by the year 2030, 62% of the world's population will reside in urban areas. This estimate makes the need for planning of livable urban environment that stabilizes the quality of life of the dwellers imperative. In order to ensure a sustainable urban environment, many countries have provided more leisure and recreational areas in urban areas for a good living and developed more urban green open spaces for urban areas (Azenan et al, 2021; Norazilawati & Othman, 2012). Urban green open spaces are natural and or semi-natural areas such as parks, gardens, street trees, forests, woodlands, and landscapes meant to provide social, economic, and environmental benefits to residents and the ecosystem (Dipeolu et al., 2020; Maas et al., 2009; Uzannah et al., 2023;). The potential benefits these open spaces offer to urban residents are increasingly impactful in an urbanized environment given their potential to improve human health, environmental quality, and neighborhood livability (Liu & Xiao, 2021; Wolch et al., 2014). Various studies have highlighted the sociocultural, ecological, and economic benefits provided by urban green open spaces (Coppel & Wustemann, 2017; Liu & Shen, 2014, Pescharat & Stigsdotter, 2013). Studies have indicated a reduction in the incidence of obesity, osteoporosis, mental health, and heart disease among urban residents when they are exposed to the outdoor environment (Ekhlom et al., 2009; Nawrath et al. 2019). Regular contact with urban green open spaces and recreational parks has been adduced to promote access to the curative and restorative benefits of nature (Dipeolu et al., 2021). In New Zealand for instance, incidences of poor health, poor mental health, cardiovascular diseases, and overweight have declined among the population, this was according to Levy-Storms et al. (2018) due to regular physical activities in green spaces. The United Nations General Assembly in recognizing the import of parks proclaimed the development of recreational parks as an integral part of the Habitat III Agenda, this was to enhance the health and well-being of urban residents in the 21st century as well as contribute to the achievement of sustainable development goals (SDG) (Ko & Lee, 2021).

However, the existence of these urban open spaces does not automatically ensure the use of them. Studies have shown that the usefulness of these parks to the social welfare and personal life of the residents depends on the frequency the open spaces are used. (Gong et al., 2015; Mohamed & Othnan, 2017). This implies that the measure of benefit urban dwellers derive from urban open spaces is a function of their individual fulfillment and satisfaction with the attributes of these open spaces. Raaij & Francken (1981) described satisfaction as the state of mind derived from fulfillment of needs and expectation without psychological, social and physiological inconveniences, hence, the need to ensure that parks provide satisfaction to the users so that the reason for their provision, even at a huge cost, would not be used in vain. Satisfaction occurs when expectations are met or exceeded (Gong et al., 2015). User satisfaction with any urban open spaces forms a veritable factor in making people interested in visiting these open spaces frequently. Nigeria, one of the developing countries in the sub-Saharan region of Africa, is experiencing rapid urbanization with its attendant social and environmental consequences (Dipeolu et al., 2020; Uzannah



et al., 2023). Like other countries in the world, her population is gradually increasing and most of them seeking more opportunities in the urban areas. In Enugu, southeast Nigeria, for example, the percentage of the urban population has reached 67% (NPC, 2007), and the number is still increasing. Hence, it has become imperative to identify interventions that can help in promoting the residents' well-being.

Despite the evidence in the literature showing studies on park users' satisfaction with urban green open spaces conducted in some cities like Sheffield (Ozyuner & Kendle, 2006), Colombo, Sri Lanka (Ranasinghe et al, 2019), Tokyo (Oku & Fukamchi, 2006), Jeddah (Addas & Risbeth, 2018), Arizona (Al- Awaiss, 1986) and Shenzhen - China (Liu & Xiao, 2021), only a few studies like that done in Nairobi (Robert et al., 2017) have considered issues on this subject in the African continent. The review by Parker & de Baro (2019) reported that most of the existing studies on the factors that affect users' satisfaction with urban parks have thus far concentrated on western cities which have different urban structures and socio-cultural dynamics unlike cities in sub-Saharan Africa in general and Nigeria in particular. The findings of these afore-mentioned studies do not have valid implications for urban areas in Nigeria. Hence, there is a need for more research to provide insight into the relationship between these open spaces and the urban residents as it relates to their perception and satisfaction with these parks. The knowledge of this interaction will provide guidelines for decision-makers and recreational planners with optimized users and imperative life qualities. This will ultimately help developers and managers of these open spaces to develop open spaces that are usable and functional in urban areas. Therefore, the present research aimed to determine the factors that influence satisfaction by open space users with open spaces in Enugu urban, southeast Nigeria. The study has the core objective of identifying the dimensions of the factors that affect open space users' satisfaction with urban green open spaces in Enugu. The study is valuable in revealing the predominant factors that play a key role in motivating the satisfaction of urban open space users. The focus on this was informed by the fact that satisfaction with these parks will increase regular visits to these green open spaces which are known to promote physical activities, and relaxation and thus help to reduce some sedentary lifestyle-associated health challenges among the urban populace (Wang et al., 2021). The findings of this study will optimize green open space planning and management in line with open space visitors' expectations. The knowledge of these open space users' satisfaction with the parks mainly in the sub-Sahara African region will prevent this space from being under-utilized as well as appreciate the potential barriers to the effective use of the space.

Literature review and theoretical framework

Even though several theories have been applied in urban green area research, this study is anchored on three classical theories which are expectancy-disconfirmation theory, equity model of satisfaction, and discrepancy theory of satisfaction. The expectancy-disconfirmation theory is one of the concepts adopted in consumer satisfaction studies globally. This McKinney et al. (2002) expectancy-disconfirmation theory depends on functionality, security, aesthetics, and provision of ancillary facilities around any subject of study. This theory which is apt to this study stems from the premise that users of any commodity or facility compare the perceived performance or output with prior expectations. These two sub-process theory postulates that users of any facility do a performance comparison between the expectations that they have formed with the disconfirmation of those expectations. McKinney et al. (2002) theory posited that users' satisfaction is perceived as an outcome of the comparison. They stated that users of any facilities will always have a preconceived expectation of any facility or product prior to the use of that facility; thus, the expectations are confirmed when the services of that facility match the early expectations and secondly, it is discontinued when the early expectation does not match the prior expectations. In other words, Omeman et al. (2021) argued that dissatisfaction occurs when the prior expectation is not significantly met, hence, the incidence of negative disconfirmation. Similarly, the discrepancy theory of satisfaction which was postulated by Oliver et al. (2021) stated that when performance matches or exceeds users' expectations, the user's will be positively confirmed; on the contrary, when the performance does not match the expectations, users of the faculty will be dissatisfied. This according to Obi et al. (2023) implies that satisfaction by users of any facility should extend beyond expectations. The equity model theory of satisfaction is another theory in this study. This theory shows that " if the individual compares their input/output returns with those of others, the consumer will be adjusted to be satisfied if the net gain is perceived to be fair" (Park & Matthew, 2001). The principle of this theory suggests that the perceived quality of any facility or commodity is measured by the level at which the facility is able to meet the service expectations of the customer (Obi et al., 2023). The relevance of these theories in this research is hinged on the notion that the perceived expectations from the visitors of these green open spaces should match with their output, this in turn will influence satisfaction. These expectations, however, in this study is seemingly subjective and cannot be measured, each participants has his/her idiosyncrasy and thoughts. Hence, this expectations may be relative. However, the relevance of the above-discussed theories is determined by three main factors. The first factor is the individual's expectations while visiting urban green open spaces. The second is the belief that visiting urban green open spaces (i.e. action) will result in some benefits and satisfaction, which are good consequences of the actions such as health benefits, safety, and others. The third factor is the availability of urban green open spaces in locations that are safe, secure, and accessible to the individual (i.e. behavioral control) for maximum satisfaction. This means that the motives for visiting urban green open spaces comprise a gamut of personal factors and behavioural control factors associated with the nature of urban green open spaces and all these are anchored on the satisfaction of the users of these facilities and parks.

Review of empirical studies

There have been various studies mostly from Asian and Western scholars that investigated urban green open space utilization and satisfaction with those urban parks as well as the possible influencing prediction. Studies by Zhang et al. (2015), Akpiner



(2016), and Evenson et al. (2016) stated that physical attributes of open spaces have been noticed to have a strong significant influence on participants' experience in the use of open spaces including accessibility to the park. Their study also agrees that the size of the park as well as the quality of the vegetation of the areas influence park users' satisfaction significantly. Furthermore, Norazelawati & Othman (2012) posited that park visitors normally have less satisfaction when they hear sounds coming from surrounding activities close to the park. They posited that such sound causes a lack of concentration in the park visitors. Other studies also submitted that lack of facilities, untidy environment, poor plant maintenance, and insecurity for the park visitors has remained great factors of non-satisfaction for any park (Cohen et al., 2020; Malek & Maripan, 2009; Mansor et al., 2019). This view sync with studies done by Ayeghi & Ujang (2014) who asserted that lack of maintenance of park and unhealthy activities among park users had caused many park participants to be unsatisfied with using particular open space. However, they submitted that despite all these factors, the easy accessibility of the park to the homes of nearby users pulls them to the open space. Again the condition and availability of public facilities are strongly correlated with the satisfaction of park users. Studies show that youths are significantly satisfied with the parks that have gymnastics facilities. (Chen et al., 2016; Ubani et al., 2023). Parks that do not have benches for the elderly, playgrounds for children, and bicycle parks for cyclists according to a findings by Alves et al. (2008), Adinolf et al. (2014) and Wright et al. (2012) give less satisfaction to the park users. However, Adinolof et al. (2014) and Wan & Shen (2015) submitted that the mere presence of facilities without proper maintenance of the park reduces the satisfaction of the users. In line with this assertion Sreetheren et al. (2014); Wang et al. (2022a) and Aspinall et al. (2010) submitted that open space users may have a negative perception about parks at the site of litters of dirt, poor quality park management and maintenance and seeing plants that have high allergenic potential, and fear of crime and insecurity. Other identified attributes that influence park users' satisfaction are the park's ability to meet users' comfort, security, and emotional needs (Mohamed & Othman, 2017), thus, the man-made and natural elements in the park make either a positive or negative impact on the visitors' satisfaction. All these factors discussed are internal factors that are directly related to the park and their various situational influence on participants 'satisfaction with the parks. Expectedly, studies have equally shown that some external factors that may not be directly to the park may influence users' park satisfaction. Aspinall et al. (2010) and McCormak et al. (2016) in their study discovered that the misbehavior of other park users has the ability to negatively influence the satisfaction of users as this can through noise disturb the peace of others. From the foregoing, it is evident that the factors that influence park visitors' satisfaction are diverse but can be classified into key areas: safety, observing nature, facility availability, relaxation and rest, and others. However, to the best of the author's knowledge, these factors have not been investigated among the urban residents in Enugu, a key metropolitan area in southeast Nigeria. This is an aspect of the existing research gap the present study attempted to fill.

Research methods

The research design adopted in the study is a cross-sectional survey. The research population comprised the three age-group categorizations (students – 18-25 years; youths – 26-40 years and middle-aged/ elderly population - 41 and above). The study was conducted in the green open spaces within the core area of Enugu Urban. The selected spaces for the study area were: Unity Park, Ngwo Park, Nnaji Park, Nike Resort, and Overcomer Tourist Garden. Entry into all these parks is free for visitors, except for the Unity park, which collects 200 Naira per visitor. The management of these parks do not keep records of those who visit them. As a result, a maximum variability of visitors to these spaces was assumed and Cochran's (1963) formula for infinite population as given in equation 1 was used to determine the sample size for the survey.

$$\text{Minimum sample size, } n_0 = \frac{Z^2 pq}{e^2} \dots\dots\dots\text{equation (1)}$$

Where n_0 represents the minimum sample size, Z is the critical value for a 95% confidence level, which in this case is 1.96; $p=0.5$; $q = 1 - p$, and e is the desired level of precision in the estimate. Substituting the above parameters in Equation 2

$$n_0 = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2} \dots\dots\dots\text{equation (2)}$$

The estimated sample size for the survey was 384 participants. Although the minimum calculated sample size for the study was 384, in order to accommodate incomplete and invalid questionnaires, 400 copies of the questionnaire were administered in the study. The data-gathering instrument used in this study was a structured questionnaire designed by the authors for this research. Data from this instrument were collected in two sections – The first section discussed the users' socio-economic profile and the second section discussed the respondents' level of satisfaction with the features of these open spaces. 29 explanatory satisfaction attributes which were elicited from reviewed literature and pilot survey were listed in the questionnaire. The questions in this section that dealt with the respondents' level of satisfaction had responses in the ranking scale. A 4-point Likert scale was used to ascertain the level of satisfaction with different aspects of the park. Responses seeking degrees of satisfaction were posed to the respondents namely: extremely satisfied (4), satisfied (3), unsatisfied (2), and extremely unsatisfied (1). Before the survey, the questionnaire was pre-tested among a few visitors to the open spaces in a pilot survey. The pilot survey helped the researchers ensure that the users of the parks have comparable standards of assessment.

The questionnaire survey was conducted between May 2021 and August 2022. Purposive sampling technique was used to determine the participants in the survey. A pilot survey was done in all the selected study areas during weekend for three months to know the average number of persons (excluding children) that visit the site monthly. These pilot survey gave the researchers an idea that, minimally, between 45 to 50 persons do visit each of the open spaces monthly. This method was similarly used by Yang et al. (2023) and Loh (2014). The questionnaire was purposively administered face-to-face to ensure that sampling across the participants represented different professional backgrounds, educations, and genders. The survey was conducted by the researchers and employed research assistants. The responses from the open spaces were thus: Unity Park (N



= 80), Nnaji Park (N =80), Nike Lake Resort (N = 80), Ngwo Park (N = 80), and Overcomers Tourist Garden (N =80). 394 copies of the questionnaire were successfully filled and used in the study. The data were analyzed using simple descriptive statistics - frequency and percentage distributions, Principal Component Analysis (PCA). The data processing and analysis were performed using the Statistical Package for the Social Sciences (SPSS) version 22.0. PCA was used to cluster and pattern the identified 29 open space user satisfaction attributes into fewer factors. The PCA also helped to identify the different dimensions (factors) in which the participant's satisfaction with the urban green spaces in the study area can be patterned.

Results and discussion

Out of the 29 factors there were identified from literature that could drive users of green open spaces to be satisfied with the park, 8 components were extracted which collectively accounted for 82.606 percent of the observed variability. The components that were retained were those that have their eigenvalue up to 1 and a factor loading threshold of 0.500 was adopted in the study after varimax rotation and cross loading of the factors were done. The first component was accessibility to the green open spaces and it showed strong positive loadings with two factors which were route to parks (0.938), and accessibility (0.887). Collectively, these factors account for 27.935% of the observed factors that influence green open space users' satisfaction with urban green open space parks, and thus, accessibility to the green open space is a factor influencing users' satisfaction with urban green open spaces in Enugu. The second component, which explains 12.030% of the variance was convenience. It is loaded significantly with factors three factors: pollution level (0.893), absence/presence of insect bites (0.775), and disturbance from rodents (0.687). The third component identified was safety and security concerns, accounting for about 10.560% of the variance in the 29 variables investigated. The three factors loaded on this are fear of crime (0.975), fear of harassment, and security concerns (0.779). This third factor has an eigenvalue of 2.112. Emotional attributes, which include rest, calmness, happiness, and air quality, contributed 7.911% to the factors that influence green open space users' satisfaction with urban green open space parks in Enugu. The study noted equally that aesthetics was the fifth factor. This accounts for 7.756% of the influencing factors that influence green open space users' satisfaction with urban green open spaces in Enugu. The physical facilities/ services attribute was the sixth factor that influenced users' satisfaction with urban green open spaces in Enugu. It has eleven attributes subsumed in this factor which include signage systems in the park, design of parks, walking tracks, sanitation facility, etc. This sixth factor accounts for 6.130% of the influencing factors of users' satisfaction with urban green open spaces in Enugu. The seventh factor was the scenery factor. It contributes 5.194% of the aggregate influencing factor. The landscape of the parks (0.891) and illumination in the open spaces (0.690) were the variables in this factor. The eighth component loaded significantly on availability of litters/waste bins (.874) and plants/park maintenance (.792) it explained 5.090% of users satisfaction of urban green open space in the study area. It is a factor that determines users' satisfaction with urban green open spaces in Enugu and it is known as the parks' management and maintenance factor. In summary, eight factors influence users' satisfaction with urban green open space in Enugu. These dimensions collectively explain a substantial portion of the factors that influence users' satisfaction visiting open spaces in the study area accounting for 82.606% of the observed variance in the 29 variables investigated.

In this study, accessibility factor, which involves the presence of a route to the park and the accessibility of roads to these spaces, had a significant influence on satisfaction levels when residents visited parks in the study area. These results lend credence to the findings of Zhang et al. (2015), and Evenson et al., (2016), who posited in their study that parks users tend to prefer/are more satisfied with parks within their locality instead of moving to a distant city with green open spaces. This is well expected because previous studies (Cohen et al., 2006; Wang et al., 2019) have shown that park visitors are quite reluctant to travel longer distances. In addition, Mowen et al. (2005) observed that spatial accessibility to parks affected the ease with which facilities can be reached and street integration factors were significant in driving elders to visit these open spaces. Furthermore, the direct route from the house to the park was the most significant accessibility factor identified. Aside from the views of Payne et al. (2002) and Akpiner (2016) opined that park users were more satisfied with parks with shorter distances to their homes, Enugu city had been experiencing insecurity and cases of kidnapping. This could, expectedly, be the reason why the residents do not want to be far from their homes.

Again, in support of the existing studies, it was also found that conveniences influenced the satisfaction of park visitors to parks among the residents in Enugu urban. These results lend credence to the findings of Liu & Xaio (2021) who revealed that the presence of mosquitoes was a determinant factor that influenced people's satisfaction with parks. Their study in Shenzhen, China suggests that although this factor has not been considered by previous studies, they posited that visitors to this Shenzhen, park rated the presence of mosquitoes and other rodents in the park as a predominant factor that caused their dissatisfaction with the park. They noted similar practices found in some of the parks in the study area where the park visitors came with mosquito repellent spray and small tents. The third most important factor that influenced visitors' satisfaction with the urban parks among the population sampled in the survey was safety and security concerns. Parks users rated their security satisfaction not only in the inside safety of the parks but also in the enjoyment and safety the parks can offer as they transverse to and fro the parks. Ayeghi & Ujang (2014) in their studies supported that users of parks feel satisfied when their safety and security are properly guaranteed while doing activities in the open spaces. However, aside from the Nike Lake park in the study area which has internally arranged security operatives, most other sampled open spaces do not. The study also presented aesthetics as a strong influencer of park users' satisfaction with the park. The sublimed variables under this factor include cleanliness, general view, and visual effects. Furthermore, evidence in the literature (Chen & Jim, 2016; Cerin et al., 2017) indicates that poor environmental cleanliness is actually an indication of improper park management. Sreetheran & Konijnendijk van den Bosch (2014) further commented about environmental uncleanliness in parks and posited that the



presence of trash cans littered around the park and much litter on the ground makes park users unsatisfied with the park. This indicates that insufficient environmental cleanliness in urban parks will obviously affect people's satisfaction.

It was also found that physical facilities and service attributes were the six most significant factors that influenced park visitors' satisfaction with the parks in the study area. This finding supports the previous work done by Wolch et al. (2005), Kaczynski et al. (2014), and Wen et al. (2018), where it was reported that the availability of public facilities in and around open spaces was significantly associated with satisfaction of visitors to green open spaces in general. It is also in line with the findings of previous research indicating that among others, open space users may have a negative perception of parks at the site of litters of dirt. (Cronin et al., 2000). Furthermore, evidence in the literature (Aspinall et al., 2010; Cerin et al., 2017; Chen et al., 2016b; Wen et al., 2018) indicates that the presence of sound or noise-generating facilities or services around open spaces tends to propel dissatisfaction by open space visitors to the area after visiting the park. Norazelawati & Othman, (2009) posited that park visitors normally have less satisfaction when there are sounds coming from surrounding activities close to the park. They posited that such sound causes a lack of concentration in the park visitors. This finding agrees with evidence in other literature indicating that external factors to the park may influence park users' satisfaction. It was noted in the study that the presence of signage features has a significant influence on park visitors' satisfaction with the park. Previous studies about the visitors-park relationship seldom have similar findings. The sign system is an open information facility with explanatory directions to park users for easy locations, directions, and movement around the park. A study by Liu & Xiao (2021) found that parks with a sign system have a higher degree of satisfaction than those with unclear sign systems or not at all. They submitted that open spaces with sign systems of propaganda, guidance, and beautifiers will meet park visitors' needs as far as possible. Maintenance and management of plants and facilities in parks was observed from this study to be positively significant to park users' satisfaction in Enugu. Even though it was the least factor that influenced satisfaction with variables that include the availability of litter bins and plant maintenance, this finding resonates with the submission by Ostoic (2017) and Ubani et al. (2023) that the mere presence of facilities and vegetation is insufficient if there is bad maintenance. It therefore suggests that open spaces with good maintenance of facilities usually have an increased degree of satisfaction. (Cohen et al., 2010; Robert et al., 2018).

Implications and conclusions

The present research investigated the factors that influence satisfaction by open space users with open spaces in Enugu urban. It concluded that the park users sampled understood the factors that influenced satisfaction with the urban parks in eight key dimensions: accessibility to spaces; conveniences; safety and security concerns; emotional attributes; aesthetics; physical facilities/ services attributes; scenery attributes and parks' management and maintenance factors. The finding of the study hold the potential for guiding designers and managers of green open spaces towards emphasizing key factors in their design and planning. These findings have some noteworthy practical and theoretical implications. Firstly, the study implies that the eight factors that influence the satisfaction of these park users are the aspects this segment of society can easily relate to in their understanding and assessment of what could drive them to visit urban green open spaces in the study area. Hence, researchers and scholars interested in this subject area should pay attention to these dimensions if they must understand the perspectives of the residents on what could make them frequently visit parks and similar spaces. In addition, the knowledge of these dimensions will improve the validity of research findings on this subject and the effectiveness of urban open spaces planning and development in Enugu and other cities that have similar demographic, and socio-cultural experiences.

Secondly, the findings also imply that to create residents' satisfactory and friendly green open spaces such as urban parks, urban planners and architects need to also pay attention to factors identified to have influenced the satisfaction of the park users sampled in this survey. To this end, urban policymakers, planners, designers, and managers should consider locating open spaces such as parks in areas that are not only accessible to homes but also very convenient to the public. Thirdly, in order for urban planners and park managers to ensure that urban residents make full use of the urban green open spaces, preliminary consideration of the opinions of users of the parks should be made and this factored in the design of parks. This will invariably contribute to better park services in the urban area. Furthermore, park managers should pay more attention to the sign systems in urban green open spaces in other to further meet park users' needs and hence increase their satisfaction with the park. This heightened knowledge of these factors significantly bolsters the reliability of planning and developing urban open spaces not only in Nigeria but in other developing countries in sub-Saharan African cities. Lastly, this support tends to support the McKinney expectancy-disconfirmation theory- which posited that users' satisfaction is perceived as an outcome of the comparison. It was literally noted that visitors to these urban green open spaces has some preconceived expectation of prior to the use of the facility; thus, the expectations are confirmed when the services of that facility match the early expectations. Thus, that theory formed a strong framework of this study and for some other related studies

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