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RE-CONFIGURING THE SOCIO-SPATIAL STRUCTURE OF NEW COMMUNITIES TOWARDS SOCIAL SUSTAINABILITY

By

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Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Mennatallah Said Mohamed Tawfik Date: .././...

Signature:

Dedication

To my beloved husband and friend

Ahmed Samir...

To my beautiful Mother

Thany Kamel...

To my sons

Adam and Ziad...

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Abstract

Rapid urbanization is considered a complex combination of many social and economic forces on a global scale. In the middle of the 20th-century, contemporary urban development created newly expanded and fragmented urban cores towards the emergence of new centralities and new cities. The newly built environment in these cities should have a particular intelligible configuration to adapt to human agents from the perspective of 'socio-spatial.' Thus, exploring other ways to reimagine scenarios for socially sustainable communities is essential. The research aims to explore the socio-spatial relations, introducing new parameters and approaches that can influence social integration/ segregation in the new urban communities. This helps understand the complexity of these relations at the local scale through the spatial configuration approach among different socio-economic groups who live in the same geographical area. This requires first studying the socio-spatial structure that tends to yield social sustainability characteristics for more socially integrated communities.

This study investigates the interrelated relations driven by the socio-spatial structure integrative theoretical framework and the proposed relational model. Multiple methods and tools are introduced as; space syntax, geographic information system (GIS), and statistical analysis methods to conceptualize, analyze, and measure these relations. The research explores the association in the scope of study between the syntactic measures of the streets and the ground floor use and investigates its significant relationship with the social behaviour and socio-economic and demographic study as a contributor to minimizing the social segregations. The syntactic measures of the streets have been studied using space syntax analysis. Through observations with video recording, the study highlights places of social interaction, gathering spots, and the other segregated areas. The socio-demographic and economic variables have been conducted from the questionnaire. These methods and tools have been studied through comprehending the results altogether and reading the relations. Then, the proposed relational model explores the statistical correlation analysis between the socio-spatial identified variables, followed by principal component analysis (PCA) to deduce the most related variables.

The research findings explore the relations between the street syntactic measures on the global and local scale and the ground floor categories distribution, which could help better allocate the commercial shops and other uses categories in future urban planning in the new communities. There is also an explorative study between the syntactic measures of the streets and ground floor use distribution with the diversity in socio-economic and demographic conditions and social behaviour related variables study (mainly walking and social interaction behaviour). These findings reveal that socio-spatial structure study and the wider spectrum of related variables using the proposed methodological approach can lead to a better understanding of the segregation phenomena, looking for the potential to better guide street design, create more walkable communities, and achieve social integration.

Keywords: Spatial configuration, Social sustainability, Walking behaviour, Social integration/segregation, Geographic Information System(GIS) .

Chapter 1 : Introduction

1.1. Research problem and Background

There is a multiplicity and complexity in addressing the analytical perspectives of urban segregation in many cities and regions worldwide, especially in those with deep social disparities. The scope of the research is chosen in the new communities as one of the city extension typologies in Egypt. There are hardly any adequate models that can incorporate these perspectives in an integrative approach to tackle urban segregation/ integration phenomena considering the social sustainability concepts in the context of new communities. The primary goal of the research is to address the complexity of socio-spatial structure as the core of the study to fill the gaps between theories, research methods, and urban practices. The gap in the research study is between the urban segregation phenomena and how to build up new socially sustainable communities that necessitate studying the socio-spatial structure and the interconnected relations.

Urban form is a dynamic process that influences people's experience, social behaviour, choice, and socio-economic processes that identify the complexity of socio-spatial relations. Thus, the socio-spatial structure which contains such relations needs to be reconceptualized and reconfigured with relational constructs and complex dynamics of contemporary urban changes. Segregation becomes intended in urban planning and design with the shift from territorial and housing segregation to segregation as the restraint of socio-spatial interactions. It requires new forms of conceptions, analyzing, measuring, and investigating a multi-dimensional relation through the complex process that influences social behaviour and people's daily experience. Segregation inherently has a relation between spatial and social dimensions; socio-spatial segregation is one of the most intensively studied issues in social and urban geography (Schnell et al., 2015; Unceta et al., 2020). Segregation refers to its empirical form as "spatial distinctions among the residential zones of population groups living in the same (urban) agglomerations" (Dupont, 2004).

The pragmatic critique of segregation models investigates the isomorphism between society and space and calls for multi-dimensional approaches in tackling socio-spatial segregation/integration urban studies. It considers social networks, activity diaries, socio-culture aspects, residential distribution with loosely correlated relations (Schnell et al., 2015), weak integration of space-time relations, and the absence of sustainable social debates. Urban practices should grapple with new approaches based on space dynamics and relational constructs rather than the deterministic scientific approaches inherited from the 1960s and early 1970s. Still, practices are poorly served by theory. There is an inactive hybrid link between spatial and social phenomena, and research methods provide limited analytical insights. New urban communities are suffering not only from spatial segregation but also from social segregation. Residential-based models are heavily criticized for lacking theoretical associations between the spatial and the social (Harvey, 1989) and for taking for granted that space has the power to determine social behaviour.

Configurational approaches have contributed to urban segregation/integration studies and broadened the segregation phenomena understanding. The configurational approaches share nonlinear relationships (in which small inputs can trigger massive consequences) and explain

the rationales for classification and causal explanation of these relations. Nevertheless, configurational thinking has long aroused ideological and methodological controversy. Empirically configurational approaches derived sets of configurations as taxonomies based on multi-variate analysis of multiple dimensions that may cover structures, processes, strategies and contexts (Meyer et al., 1993). These approaches conduct the individuals and the encounters between them; namely, the possibility of these encounters to happen, partly depending on the configurational analysis and characterizing segregation on different scales.

1.2. Research questions

There are multiple and different externalities that should be taken into consideration while interpreting urban segregation and studying socio-spatial relations. How to convey a theoretical study and develop empirical research that could explore socio-spatial relations in the new communities from the lens of social sustainability? This research addresses key questions that could give the potential for predictable action. This research study raises four main questions:

1. What are the approaches that can relate social sustainability concepts to the urban segregation phenomenon?
2. How can integrative methods and tools interpret the segregation/integration implications in the new communities from the lens of social sustainability while studying the socio-spatial structure?
3. How to explore the potential of influential variables identification that composes the socio-spatial structure for socially integrated communities' urban development?
4. How to elicit the main factors that bring diversity between different socio-economic groups in the same geographical area in new communities' context and give the potential for urban integration?

1.3. Research aims and objectives

The research aims to explore the socio-spatial relationships in the context of new communities with socio-economic disparities, considering both spatial and social dimensions. These relationships are developed from the perspective of urban integration/segregation to provide interpretive and integrative methods that help read the complexity of the socio-spatial structure. The main objectives are:

1. Proposing a configurational approach to consider the complexity of socio-spatial relations to achieve social sustainability. This approach can elicit a socio-spatial structure integrated framework, exploring the potential for urban integration in the context of new communities.

2. Exploring a methodological approach that helps understand the socio-spatial relations in a geographical area that have different socio-economic groups to interpret the urban segregation phenomena looking for socially sustainable communities.
3. Formulating a proposed relational model that can specify and explore the associated relationships between the selected spatial and social variables conducted from a studied socio-spatial structure measurable index. It contributes to the study of social segregation in new communities' context.

1.4. Research scope and significance of the study

This research is grounded in socio-spatial relations, pursuing better options for social integration. It is an interdisciplinary scope among; socio-economic and demographic conditions, socio-behavioural, and spatial studies. It introduces time geography, human mobility, utilization of activity space concepts, and contextual exposure to explore the potential for socially sustainable communities. Social sustainability is very broad with many related concepts and different conditions and has largely been ignored in urban segregation studies. Thus, the socio-spatial structure dimensions are studied in this research scope, considering interrelated concepts of social sustainability focusing on social aspects of integration, social behaviour, and the relation with spatial structure. The research literature review and the theoretical framework that drive the methodological approaches have been highlighted, studied, and developed in this scope.

Socio-spatial segregation is a complex process that evolves dynamically through space and time, exploring the influential factors to map segregation/integration in the new communities. The study's significance is highlighted as follows:

1. The research tackles segregation/integration in new communities from an interdisciplinary approach. The study bridges the theoretical conceptions of social sustainability and socio-spatial structure with the analysis of socio-spatial relations and their applications.
2. Many segregation studies negotiate how the spatial structural system can be produced without paying attention to sustainability indicators, especially the social dimension. This research reconfigures the socio-spatial structure and investigates mixed methods and tools to experiment with variables that can trace segregation/ integration in new communities and contribute to social integration in everyday life, considering the walking behaviour 'realm' and ground floor use distribution.
3. Experimenting the proposed integrative theoretical framework and a relational model in the empirical study helps consolidate the whole discourse of analysis and read the complex reality of urban segregation/integration. This exploratory research nature, with its related theories and methodological approaches, adds to the knowledge of socio-spatial studies for better future urban planning and development in the context of new communities