**Introduction**

The field of crime location choice research has seen a notable shift from examining broader geographic entities such as states, cities, and neighbourhoods (Loftin and Hill, 1974; Baumer et al., 1998) to a more granular focus on micro units like street segments and face blocks (Eck and Weisburd, 1995; Sampson and Groves, 1989). This transition to micro-level analysis is pivotal in enriching our understanding of crime dynamics. It offers a detailed lens through which crime patterns can be dissected, revealing subtleties that are often overshadowed in larger spatial contexts. The granularity of micro-level analysis not only enhances our theoretical comprehension of criminal behaviour but also plays a crucial role in shaping effective crime prevention strategies and policy-making. However, despite its growing popularity, there is an evident lack of consensus in the academic community regarding the impact of spatial scale on the comparability and interpretation of crime data. This divergence is particularly noticeable when attempting to align findings across different studies, raising questions about the universal applicability and reliability of conclusions drawn from micro-level analyses. This gap in consensus underscores the necessity for a systematic exploration of the influence of various spatial scales on crime pattern analysis, an endeavour that is crucial for the theoretical evolution and practical application in the field of criminology.

**Problem Statement**

The current state of crime location choice research reflects a burgeoning interest in micro-level analysis, yet it also reveals a critical gap: the ambiguity surrounding how different spatial scales affect the comparability and interpretability of crime data across diverse studies. This lack of clarity presents a significant challenge, as it impedes the ability to form a cohesive understanding of crime patterns and hinders the development of universally applicable theoretical frameworks. Therefore, addressing this issue is paramount for advancing criminological theory and enhancing the efficacy of practical applications derived from research findings.

**Aims and Objectives**

The primary aim of this paper is to delve into the effects of varying spatial scales on crime location choice studies. This exploration is intended to bridge the gap in understanding how different spatial resolutions impact the analysis and interpretation of crime data.First, we conduct an extensive review of existing literature to map the evolution of spatial scale usage in crime location choice research and to understand the current state of knowledge in this domain. Then, we perform an empirical analysis of crime data at multiple spatial scales. This analysis aims to empirically demonstrate how varying spatial resolutions can lead to different interpretations and conclusions about crime patterns. By achieving these objectives, this paper seeks to provide a clearer understanding of the role spatial scale plays in crime location choice research and to contribute to the ongoing discourse in the field of criminology.

**Structure of the Paper**

The paper is structured as follows: an initial literature review provides a historical perspective on spatial scales in criminology, followed by a theoretical background that lays the foundation for understanding the role of spatial scale in crime analysis. The paper then delves into an empirical analysis, examining the influence of spatial scale on crime patterns, and concludes with a discussion of the findings and their implications.

**Literature Review**

**Historical Perspective**

The journey of criminological research has witnessed a significant transformation from its initial focus on larger geographic units to a more refined micro-level analysis. Early studies in this field predominantly utilized larger geographic units such as states, cities, and neighborhoods, laying a foundational understanding of crime patterns across broader areas (Loftin and Hill, 1974; Baumer et al., 1998). These studies were instrumental in establishing baseline knowledge about crime distribution and its correlation with larger societal structures. However, the advent of micro place analysis marked a pivotal shift in criminological research, focusing on more specific locales like street segments and block faces (Eck and Weisburd, 1995; Sampson and Groves, 1989). This shift was not merely a change in the unit of analysis but represented a deeper methodological and theoretical reorientation in understanding crime.

**The Shift to Micro-Level Analysis**

This paradigm shift to micro-level analysis was largely influenced by emerging theoretical perspectives that emphasized the context of crime and the opportunities presented at micro places (Weisburd et al., 2004; Curman et al., 2015). These perspectives argued that to understand crime fully, it is essential to analyze it at a granular level where the nuances and intricacies of criminal behaviour are more discernible. Such granular analysis has been instrumental in shedding light on crime trends and patterns at a finer scale, offering detailed insights into the dynamics of criminal activity. It has enabled researchers to identify and examine the specific characteristics of places that influence crime, such as the presence of crime generators and attractors, and how these interact with broader social dynamics.

**Micro-Level Studies and Their Findings**

Studies focusing on micro units like street segments and face blocks have unearthed critical insights into crime concentration and stability over time (Braga et al., 2011; Groff et al., 2010). These studies have consistently found that crime is not uniformly distributed across cities but is instead concentrated at specific micro places, often exhibiting remarkable stability over time. This concentration and stability challenge the traditional understanding of crime as a uniformly distributed phenomenon and underscore the importance of micro-level analysis in comprehending the spatial distribution and persistence of crime.

**Discussion of Discrepancies and Gaps in Literature**

Despite these significant advancements, there are noticeable discrepancies and gaps, particularly when comparing results across different spatial scales. One of the critical challenges is the lack of a standardized approach for choosing the appropriate spatial unit for analysis, which leads to difficulties in comparing and consolidating findings from different studies. Additionally, there is an ongoing debate about the extent to which findings from micro-level studies can be generalized to broader contexts. This paper seeks to address these gaps by providing a comprehensive review and analysis of how different spatial scales impact crime analysis, thereby contributing to a more cohesive understanding of spatial dynamics in criminology.

In Table 1, the variety of units employed across studies showcases the breadth of methodological diversity in spatial criminology. The table illustrates the evolution from larger geographic units like census blocks and residential suburbs to more precise units such as street segments and grid cells. It provides an empirical testament to the theoretical shift towards micro-level analysis, reflecting a nuanced approach to examining the spatial characteristics of crime. This diversity in unit size from mere meters to several kilometers speaks to the need for a more harmonized approach in spatial analysis to ensure comparability and generalizability of research findings. The table serves as a critical reference for understanding the current landscape of spatial criminology research and underscores the importance of aligning theoretical perspectives with methodological choices.

The data in Table 1 also underline the complexity of crime location choice research, highlighting the range of scales—from the intimate level of individual properties to broader community and neighbourhood levels—that researchers have deemed significant in understanding criminal behaviour. This diversity not only presents a challenge for comparative analysis but also offers an opportunity for a meta-analytical approach that might bridge the findings from these disparate scales.

Furthermore, the table reveals the concentration of incidents within specific units of analysis, suggesting that certain spatial units are more prone to crime than others. This concentration aligns with the principles of environmental criminology, which posits that crime is not randomly distributed but rather concentrated in certain places that offer conducive conditions for criminal opportunities. The findings from the listed studies, summarized in the table, affirm the importance of place in criminology and the need to consider how different spatial units can influence our understanding of where, why, and how crimes occur.

In future research, there is a need to develop a systematic approach to determine the most appropriate spatial unit for analysis. Such an approach would consider the theoretical underpinnings of crime location choice as well as the practical implications for crime prevention and policy-making. A standardized approach could enhance the comparability of studies, allow for the replication of findings, and ultimately contribute to a more comprehensive understanding of the spatial dynamics of crime. The research summarized in Table 1, with its varied spatial scales and units, provides a rich foundation upon which such standardization efforts could build.

By integrating the methodological diversity revealed in Table 1 with a theoretical framework that accounts for the significance of place in crime occurrence, future studies can continue to refine our understanding of the intricate relationship between space and crime. This integration is pivotal for developing targeted interventions and effective policy responses that reflect the spatial specificity of crime and address the unique conditions of each place.

**Theoretical Background**

The theoretical underpinnings of spatial scale in criminology are essential for understanding how different environments influence criminal behaviour. These theories provide a scaffold for interpreting the spatial distribution of crime and are central to both academic research and practical applications in law enforcement and urban planning.

**Theoretical Foundations of Spatial Scale in Criminology**

The theoretical exploration of spatial scales in criminology is deeply influenced by spatial aggregation theory and routine activities theory. Spatial aggregation theory suggests that the way we group spatial data can affect the patterns we observe, often referred to as the modifiable areal unit problem (MAUP). This concept warns of potential biases that arise when researchers aggregate data into different spatial units, such as neighborhoods or street blocks, which can lead to different analytical outcomes.

Routine activities theory, proposed by Cohen and Felson (1979), posits that the likelihood of a crime occurring is dependent upon the convergence in space and time of motivated offenders, suitable targets, and the absence of capable guardians. This perspective highlights the importance of analyzing crime at the micro level, where the daily movements of people bring these three elements into alignment, thereby creating opportunities for crime.

**Crime Generators and Crime Attractors**

Further refining the theoretical approach to spatial analysis, Brantingham and Brantingham (1995) introduced the concepts of crime generators and crime attractors, which explain the geographic clustering of crime. Crime generators are places that, by their nature, draw large numbers of people, such as shopping centers or stadiums. These high-traffic areas increase the likelihood of crimes occurring simply due to the volume of potential targets and offenders. Crime attractors, on the other hand, are locations that draw in offenders because they are known for opportunities for crime, such as areas with a high density of bars or parking lots with poor lighting.

**Implications of Spatial Scale for Crime Analysis**

The choice of spatial scale in crime analysis has significant implications for both theory and practice. Larger scales may mask the complexity of crime patterns seen at the micro level, while smaller scales can reveal localized crime hotspots and the effect of immediate environmental features. These insights are crucial for developing targeted crime prevention strategies, informing policing tactics, and shaping public policy.

**Addressing Spatial Interdependence**

A key concern in spatial criminology is the concept of spatial interdependence, the idea that crime at one location is influenced by crimes in nearby areas. This phenomenon can be understood through theories such as crime pattern theory, which recognizes that the places people choose for activities can affect the location of crimes, and environmental criminology, which examines how the physical environment shapes crime opportunities.

Bernasco & Block (2011) underscore the importance of considering spatial interdependence in micro-level analysis. They suggest that ignoring the spatial dependency between nearby locations can lead to incomplete or biased understandings of crime patterns. For instance, the presence of a crime generator like a shopping mall can influence the crime rates not only on its premises but also in the surrounding area.

In conclusion, the theoretical framework of spatial scale in criminology is vital for a holistic understanding of crime. It emphasizes the need for careful consideration of the spatial units of analysis, the recognition of the complex interplay between environmental factors and crime, and the significance of understanding spatial interdependence to fully grasp the dynamics of criminal activity.

**Literature Review**

**Historical Perspective** The journey of criminological research has witnessed a significant transformation from its initial focus on larger geographic units to a more refined micro-level analysis. Early studies predominantly utilized larger geographic units such as states, cities, and neighborhoods, laying a foundational understanding of crime patterns across broader areas (Loftin and Hill, 1974; Baumer et al., 1998). These studies were instrumental in establishing baseline knowledge about crime distribution and its correlation with larger societal structures. However, the advent of micro place analysis marked a pivotal shift in criminological research, focusing on more specific locales like street segments and block faces (Eck and Weisburd, 1995; Sampson and Groves, 1989). This shift was not merely a change in the unit of analysis but represented a deeper methodological and theoretical reorientation in understanding crime.

Early criminological research was implicitly guided by spatial aggregation theory, integral to the theoretical exploration of spatial scales. This theory, highlighting the modifiable areal unit problem (MAUP), suggests that the spatial grouping of data can significantly influence the patterns observed, leading to varying analytical outcomes based on the chosen spatial units.

**The Shift to Micro-Level Analysis** This paradigm shift to micro-level analysis was largely influenced by emerging theoretical perspectives that emphasized the context of crime and the opportunities presented at micro places (Weisburd et al., 2004; Curman et al., 2015). These perspectives argued that to understand crime fully, it is essential to analyze it at a granular level where the nuances and intricacies of criminal behaviour are more discernible. Such granular analysis has been instrumental in shedding light on crime trends and patterns at a finer scale, offering detailed insights into the dynamics of criminal activity. It has enabled researchers to identify and examine the specific characteristics of places that influence crime, such as the presence of crime generators and attractors, and how these interact with broader social dynamics.

The shift towards micro-level analysis aligns with routine activities theory, which emphasizes the convergence of motivated offenders, suitable targets, and the absence of capable guardians in space and time, thereby creating opportunities for crime. This theory underscores the importance of detailed analysis at a micro level, consistent with the methodological shift observed in criminological studies.

**Micro-Level Studies and Their Findings** Studies focusing on micro units like street segments and face blocks have unearthed critical insights into crime concentration and stability over time (Braga et al., 2011; Groff et al., 2010). These studies have consistently found that crime is not uniformly distributed across cities but is instead concentrated at specific micro places, often exhibiting remarkable stability over time. This concentration and stability challenge the traditional understanding of crime as a uniformly distributed phenomenon and underscore the importance of micro-level analysis in comprehending the spatial distribution and persistence of crime.

**Discussion of Discrepancies and Gaps in Literature** Despite these significant advancements, there are noticeable discrepancies and gaps, particularly when comparing results across different spatial scales. One of the critical challenges is the lack of a standardized approach for choosing the appropriate spatial unit for analysis, which leads to difficulties in comparing and consolidating findings from different studies. Additionally, there is an ongoing debate about the extent to which findings from micro-level studies can be generalized to broader contexts. This paper seeks to address these gaps by providing a comprehensive review and analysis of how different spatial scales impact crime analysis, thereby contributing to a more cohesive understanding of spatial dynamics in criminology.

The discussion on spatial scales and their selection in criminology is deeply tied to the implications of MAUP. This problem warns of potential biases and inconsistencies in research findings due to the varying spatial units used, emphasizing the need for a more harmonized approach in spatial analysis. Additionally, the concepts of crime generators and crime attractors, as proposed by Brantingham and Brantingham (1995), are vital in understanding the geographic clustering of crime and should be considered in relation to the choice of spatial unit.

In Table 1, the variety of units employed across studies showcases the breadth of methodological diversity in spatial criminology. The table illustrates the evolution from larger geographic units like census blocks and residential suburbs to more precise units such as street segments and grid cells. It provides an empirical testament to the theoretical shift towards micro-level analysis, reflecting a nuanced approach to examining the spatial characteristics of crime. This diversity in unit size from mere meters to several kilometers speaks to the need for a more harmonized approach in spatial analysis to ensure comparability and generalizability of research findings. The table serves as a critical reference for understanding the current landscape of spatial criminology research and underscores the importance of aligning theoretical perspectives with methodological choices.

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In future research, there is a need to develop a systematic approach to determine the most appropriate spatial unit for analysis. Such an approach would consider the theoretical underpinnings of crime location choice as well as the practical implications for crime prevention and policy-making. A standardized approach could enhance the comparability of studies, allow for the replication of findings, and ultimately contribute to a more comprehensive understanding of the spatial dynamics of crime. The research summarized in Table 1, with its varied spatial scales and units, provides a rich foundation upon which such standardization efforts could build.

By integrating the methodological diversity revealed in Table 1 with a theoretical framework that accounts for the significance of place in crime occurrence, future studies can continue to refine our understanding of the intricate relationship between space and crime. This integration is pivotal for developing targeted interventions and effective policy responses that reflect the spatial specificity of crime and address the unique conditions of each place.