

The relationship between cultural factors, the ecological structure of neighborhoods, and their impact on crime patterns and rates.

– A field study on a group of neighborhoods in the Wilaya of Tebessa-

العلاقة بين العوامل الثقافية والبناء الإيكولوجي للأحياء وتأثيرها على أنماط الجرائم ومعدلاتها.

-دراسة ميدانية على مجموعة من الأحياء بولاية تبسة-

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Date of submission: 01/02/2025

Date of acceptance: 08/06/2026

Abstract

This study aimed to identify the relationship between neighborhood urban ecology and crime patterns in Tebessa. Drawing on ecological criminology theories, we analyzed official crime statistics (2016–2020) issued by the Tebessa Security Directorate across five neighborhood types. Based on 6,842 recorded incidents, the results showed clear spatial concentration of crime: drug offenses were highest in dense traditional neighborhoods (39%), property crimes were concentrated in under-served neighborhoods (37.6%), and smuggling was most prevalent in neighborhoods closest to the Tunisian border (33%). Modern planned neighborhoods recorded lower levels of crime. Overall, the findings indicate a strong association between crime patterns and housing quality, infrastructure adequacy, and geographic location..

Keywords: Neighborhoods; ecological structure; cultural factors; crime patterns; crime rates

المخلص

هدفت هذه الدراسة إلى الكشف عن العلاقة بين الإيكولوجيا الحضرية للأحياء وأنماط الجريمة بمدينة تبسة. وبالاستناد إلى نظريات علم الإجرام الإيكولوجي، جرى تحليل إحصاءات الجريمة الرسمية للفترة (2016–2020) الصادرة عن مديرية أمن تبسة عبر خمسة أنواع من الأحياء. وأظهرت نتائج الدراسة المستخلصة من 6,842 واقعة، وجود تركز مكاني واضح للجريمة؛ إذ كانت جرائم المخدرات الأعلى في الأحياء التقليدية عالية الكثافة (39%)، بينما تركزت جرائم الأموال في الأحياء ضعيفة الخدمات (37.6%)، وبرزت جرائم التهريب في الأحياء الأقرب

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إلى الحدود التونسية (33%). كما سجلت الأحياء ذات التخطيط الحديث مستويات أدنى من الجريمة، بما يعزز أن أنماط الجريمة ارتبطت ارتباطاً قوياً بجودة السكن وكفاية البنية التحتية والموقع الجغرافي. الكلمات المفتاحية: الأحياء؛ البناء الإيكولوجي؛ العوامل الثقافية؛ أنماط الجريمة؛ معدلات الجريمة.

I. Introduction

Human settlement patterns have evolved from nomadic formations to complex urban centers, reflecting humanity's fundamental need for communal living, cooperation, and shared existence. From nomadic tribes forming clans to settled agricultural villages and eventually expansive cities, human communities have continuously transformed. Modern cities are characterized by expansion, diverse infrastructure, transportation networks, and varied neighborhoods with distinct housing types, creating complex social environments where neighborhoods form essential components of individual social experience.

Since their emergence, neighborhoods have represented patterns of social organization within geographical and social fields where people live. A neighborhood comprises individuals who share relationships, interests, and goals within defined spatial boundaries, striving for life continuity and a sense of belonging through relationships governed by social norms and principles. Neighborhoods also represent urban units defined by planning, housing construction, streets, and infrastructure (Achour, 2008, p. 20).

Research Problem:

This study addresses the following question: **How does the cultural dimension of environmental construction affect individuals' behaviors related to crime?**

II. Theoretical Framework:

This study draws from three complementary ecological criminology perspectives: the Chicago School's social disorganization theory, crime concentration theory, and broken windows theory.

2.1. Ecological Theory (Chicago School):

The Chicago School, pioneered by Robert Park and Ernest Burgess, established ecological approaches to understanding urban crime. Their studies centered on differences in crime rates across geographical regions and their relationship to social, cultural, and economic conditions.

Park developed an ecological perspective emphasizing interaction between the urban environment and its characteristics, patterns, values, and attitudes. He argued that cities

function as "social laboratories" for analyzing urban phenomena. Park addressed migration and urbanization as permanent phenomena that become social problems when rural migrants, carrying traditional culture characterized by rigid customs, encounter urban culture characterized by individualism, public opinion, and formal law (Amtouch, 2001, p. 60).

Park regarded the city as both natural and cultural space inhabited by civilized humanity a unit built on organizational principles. Burgess viewed urban growth as a consequence of simultaneous organizational and disintegration processes (Amtouch, 2001, p. 74).

Crime interpretation in this framework associates illegal behavior with social disintegration conditions arising from urban growth processes. It is not poverty, ignorance, overcrowding, or inadequate housing alone that explain crime, but rather symptoms of system decay and social control deterioration.

Louis Wirth's urban-themed ideas demonstrated that population size, density, and heterogeneity combine to form urban culture. This leads to traditional kinship ties disintegrating, tearing apart social connections, making relationship establishment difficult, and weakening social integration—reflected in isolation, alienation, frustration, and antisocial behavior (Al-Hasani, 2000, p. 120).

The ecological trend is reflected in Clifford Shaw's work examining how crime ratios vary from one neighborhood to another.

2.2. Crime Concentration Theory:

This theory centers on crime concentrating in peripheral neighborhoods due to opportunity availability, as these places are less protected than other city areas. Shaw and McKay (1942) found urban crime generally concentrated in city centers, then decreasing toward fringes. However, Brantingham and Brantingham (1975) found in British cities that crime concentrated in city peripheries due to lack of protection and ease of escape. These different outcomes reflect different urban compositions—American cities versus British ones have distinct spatial organizations and natural features (Al-Juhani, 2018, p. 9).

2.3. Broken Windows Theory:

This theory, developed by James Q. Wilson and George L. Kelling (1982), is linked to the concept of disorder. John Conklin was among the first to use this concept when referring to disorder behaviors' impact on social life and sense of insecurity, based on studies undertaken in American cities since 1975.

According to broken windows theory, lack of security contributes to breaking down neighborhood relationships, where individuals feel unsafe in their neighborhoods and become less inclined to defend informal norms of social life (Souakri, 2001). Disorder and antisocial behavior significantly impact crime. For example, failure to repair broken windows quickly leads to more windows being broken. After all windows are broken,

physical attacks and theft begin, indicating the place lacks social control. Disorder in residential neighborhoods leads some families to leave, especially when conflicts occur on sidewalks. The theory emphasizes the importance of social and neighborhood ties in crime prevention.

III. Methods:

3.1. Research Design:

This study employed a descriptive-analytical approach to examine spatial crime patterns across ecologically diverse neighborhoods in Tebessa, Algeria. The research design utilizes quantitative crime data analysis to explore relationships between neighborhood characteristics and criminal activity over a five-year period (2016-2020).

3.2. Study Setting

Tebessa is a medium-sized Algerian city (population approximately 200,000) located in northeastern Algeria near the Tunisian border. The city exhibits diverse urban typologies resulting from multiple historical periods: Ottoman-era traditional neighborhoods, French colonial constructions, post-independence popular settlements, modern planned developments, and peripheral informal areas.

3.3. Sampling Strategy:

We utilized purposive sampling to select five study areas representing distinct neighborhood typologies. This method was chosen because the research objective required maximum variation in ecological characteristics to test theoretical propositions.

Selected Study Areas:

- **Area 1:** Al-Jarf, Al-Mezab, Rafana neighborhoods (popular neighborhoods)
- **Area 2:** Larmot, El-Kanissa, El-Bassatine neighborhoods (traditional neighborhoods)
- **Area 3:** Zawiya, Bab al-Ziatin, El-Zitoun neighborhoods (traditional commercial neighborhoods)
- **Area 4:** Jedyat Masood, La Rokad, Bouhmra neighborhoods (peripheral marginalized neighborhoods)
- **Area 5:** Annaba Road, Bourgeois neighborhoods (modern affluent neighborhoods)

3.4. Data Collection

Data Source: Official crime statistics from Tebessa Central Security Directorate.

Temporal Coverage: January 1, 2016 – December 31, 2020 (60 months).

Crime Categories (based on Algerian criminal code):

1. Promotion and trafficking of psychotropic substances
2. Assault on property (theft and burglary)
3. Prostitution
4. Smuggling (primarily cross-border fuel trafficking)
5. Assaults and altercations

Total Incidents: 6,842 across all areas over five years.

Authorization: Formal written permission obtained from Tebessa Security Directorate through official institutional channels.

3.5. Data Analysis:

Descriptive statistics (frequencies, percentages, averages) were calculated for each crime type by area and year. Cross-area comparisons identified spatial crime patterns. Patterns were interpreted through ecological criminology theoretical frameworks.

3.6. Ethical Considerations :

Formal institutional authorization obtained; only aggregate data accessed; confidentiality maintained; findings presented objectively without stigmatizing communities.

IV. Background: Neighborhood Ecology in Tebessa:

4.1. Classifications of Neighborhood Types:

Each residential neighborhood constitutes a distinct entity impacting property values. Significant variations in housing and land prices across neighborhoods result from location, available services, population characteristics, social interaction patterns, and crime presence or absence. Among the most important classifications are:

4.1.1. Popular Neighborhoods:

Popular neighborhoods emerge as urban units with particular organization inhabited by populations with limited incomes and weak to moderate living standards. Most homes are constructed with simple local materials. These neighborhoods typically serve as meeting places for various social groups whose daily lives are complicated by significant overcrowding (Chouichi, 2006, p. 76).

In terms of planning, such neighborhoods are characterized by narrow alleyways, overlapping homes, and lack of necessary facilities. They contain different social groups—elders, women, men, and children across various age ranges. Families tend to be extended and large with limited educational and professional levels, though social relations remain strong among community members.

This urban pattern in Algeria dates back to the colonial era, when large rural-to-urban migrations contributed to significant city overcrowding (Chouichi, 2006, p. 76).

4.1.2. Traditional Neighborhoods:

Traditional neighborhoods represent urban units inhabited by communities for extended periods. These neighborhoods exhibit prominent distinguishing characteristics, including religious establishments such as ornate mosques, traditional houses with wooden doors, and large family sizes.

Illiteracy prevalence remains characteristic of traditional neighborhoods, negatively affecting the development of modern lifestyles. However, these neighborhoods maintain traditional aspects of professions and crafts practiced by many members.

Most of Algeria's traditional neighborhoods were built during Ottoman rule. Buildings are characterized by construction materials consisting of simple local elements. Physical patterns are dense, forming coherent textures. Traditional houses are built with stones and mud, with narrow winding streets. Buildings are typically two

stories connected by stairs and surrounded by a central courtyard (Chouichi, 2006, p. 77).

In Tebessa, two types of traditional dwellings exist: those built during Ottoman rule found inside Roman walls, characterized by huge stones and arched wooden doors; and French colonial constructions with European character, featuring wider alleyways, short doors, long iron windows, and regular construction.

4.1.3. Modern Neighborhoods:

Modern neighborhoods represent urban units inhabited by communities for relatively short periods. Most are newly established compared to old neighborhoods, aimed at introducing modern lifestyles to solve housing crises. These neighborhoods often do not respect traditional customs in both social and urban terms.

These neighborhoods consist of clusters built with forms contrary to ancient neighborhoods. Physical specifications include multi-floor heights with uniform geometric forms. They possess equipment lacking in most popular and traditional populations, such as vital networks (water, electricity, gas, telephone), open spaces, wide streets, parking facilities, and distinct architectural character (Chouichi, 2006, p. 78).

4.1.4. Slums :

Slums represent another form of urban occupation by villagers and rural dwellers in places left empty by owners or acquired by marginalized populations living in difficult social conditions. Many researchers agree that slums are poor-looking residential areas lacking master planning with distinct social, economic, and cultural characteristics, predominantly chaotic and unplanned (Matouk, 1997, p. 301).

Clinard defines slums as a lifestyle and subculture with certain social values and norms, where inhabitants are isolated in areas far from power centers, perceived as below the level of other city inhabitants (Wilemi, 2007, p. 159).

4.2. Neighborhood Ecology and Crime Relationships:

The ecological environment where individuals live represents one aspect of quality of life. Environmental conditions can contribute positively or negatively. The nature of this environment encompasses several aspects:

- Neighborhood location and street/transport conditions, affecting movement flow and social interaction ease
- Nature of facilities and services, including infrastructure, lighting, and sidewalks
- Population's sense of security—neighborhoods must be comfortable, calm, and free from problems
- Natural environmental problems, such as pollution and lack of green spaces

4.2.1. Slums and Crime:

Slums represent serious social phenomena threatening society due to growing numbers and negative effects. This disadvantaged environment produces crime and violence, contributing directly or indirectly to criminal phenomenon spread. Characteristics include social disintegration, physical deterioration, widespread unemployment, weak opportunities, and feelings of marginalization (Zerara, 2014, p. 58).

4.2.2. Deviant Foci:

Deviant foci are defined as areas within neighborhoods where delinquency and moral decay are established and vice manifestations are common. Such locations include dens where illegal activities occur and stolen or smuggled goods are hidden.

4.2.3. Dark Areas:

Dark areas can be defined as locations where social problems such as poverty, unemployment, substandard housing, and chaotic constructions abound. Characteristics include low housing quality, lack of space, overcrowding, and difficult living conditions.

In Tebessa, examples include:

- **Mezab neighborhood:** Mediated by Wadi Mezab, posing significant risk during heavy rainfall. The valley often serves as garbage disposal and drug use location.
- **Jediyat Masood neighborhood:** Characterized by anarchic buildings and slums, featuring altercations, rebellions, road closures due to poor road conditions. Roads fill with mud during rain, hindering movement. Lack of garbage containers persists.

4.3. Cultural Dimensions:

4.3.1. Delinquent Culture:

Delinquent cultures consist of groups with their own culture, distinctive interaction methods, and special life philosophy. Many poor city groups reside in underdeveloped neighborhoods—geographically peripheral, functionally deprived of city services. They remain distant from urban life, with limited mixing opportunities with other city residents except in public spaces or through work.

Cohen's theory of structural strains discusses delinquent gangs arising from class structure. Young people from disadvantaged backgrounds feel frustration because middle-class values dominate and possess their aspirations for success. Aware of their inability to achieve these goals through legitimate means, some create delinquent subcultures where mainstream values are rejected (Al-Karemeen, 2014).

These groups possess low status within the social stratification system and suffer isolation. Facing difficult social situations with prevalent cultures of despair and absence of serious solutions, they resort to forming subcultural groups opposed to society's general culture, encouraging members to adopt illegal methods such as theft and trafficking.

4.3.2. Cultural Conflict in Peripheral Neighborhoods

Shaw described these as residential neighborhoods characterized by deteriorating social, economic, and population characteristics. These areas, with special physical and cultural composition characterized by low living standards and cultural conflict, show highest incidence of violence, creating clashes between social groups (Al-Hasani, 2000, p. 121).

This theory focused on migration and integration problems, and the relationship between culture and urban sphere—crystallizing the concept of "urbanization" encompassing demographic (movement from countryside to city) and sociological dimensions (integration and urban culture acquisition) (Al-Maliki, 2016).

4.3.3. Urbanization :

Large population density generates crowding phenomena within dwellings, markets, and neighborhoods. With absence of comfort facilities, shabby urbanization results (Al-Jawhary, 2010, p. 174).

City high population density, rather than strengthening communication between individuals, strengthens distancing and differences. Despite physical proximity, social contacts diverge. Neighborhood proximity does not result in interaction between different social communities, leading to individualism in urban society (Al-Maliki, 2016, p. 158).

4.3.4. Heterogeneity:

Heterogeneity is the inevitable result of high volume and density and direct response to economic and social conditions. Heterogeneity leads to community diversity, affiliation conflicts, increasing mobility, and potentially social disintegration.

Wirth considers that the larger the urban community, the more individual diversity expands, increasing spatial isolation of individuals and groups. Spatial segregation contributes to weakening neighborhood bonds (Herbert, 2001, p. 23).

V. Results :

Crime patterns in Tebessa neighborhoods reflect social composition, urban organization, and spatial distribution. Social geographical studies of Western cities during the 1960s highlighted spatial factors' importance in crime distribution, linking rates and types to specific environmental sites. Regional disparities have been linked to social indicators such as education, population density, poverty, and illiteracy (Herbert, 2001, p. 48).

In our study, social, ecological, and cultural factors of each neighborhood have been linked to prevailing crime patterns to identify significant factors contributing to criminal activity.

5.1. Area 1: Al-Jarf, Al-Mezab, Rafana Neighborhoods

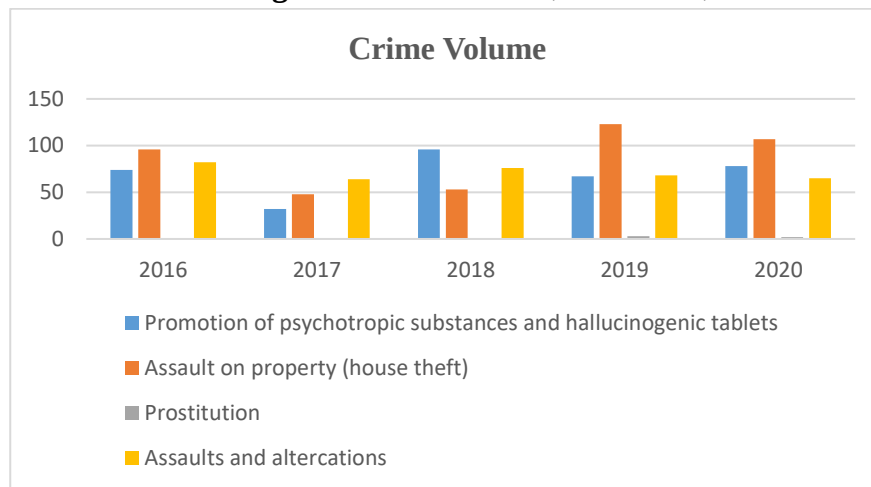
Table 1: Crime Volume in Al-Jarf, Al-Mezab, Rafana Neighborhoods (2016-2020)

Crime Volume in Neighborhoods: Al-Jarf, Al-Mezab, Rafana								
Crime Pattern	Years					Total	Average	Percentage %
	2016	2017	2018	2019	2020			
Promotion of psychotropic substances and hallucinogenic tablets	74	32	96	67	78	374	69,4	30,5
Assault on property (house theft)	96	48	53	123	107	427	85,4	37,6
Prostitution	1	0	1	3	2	7	1,4	0,6
Assaults and altercations	82	64	76	68	65	355	71	31

Source: Tebessa Security Directorate

Figure. 01 :Crime

Volume in Neighborhoods: Al-Jorf, Al-Mezab, Rafana



Source: Researchers' preparation

House theft ranked first at 37.6%. This results from the nature of individual short-ceiling housing units without iron fences or barriers. Windows and doors made with medium-quality materials are easy to break due to residents' low-income status. Most are poor, some displaced from countryside, some who purchased cheap land plots and built their dwellings, making them easily burglarize.

Assaults and altercations rank second at 31%, attributed to demographics—the largest proportion being young people and adolescents who leave school at early ages. Drug trafficking ranks third at 30.5%, exacerbated by drug use dens, especially the antiquities area within Mezab neighborhood (Busta al-Khalia), plus proximity of Jabal al-Dakan mountain, which attracts large numbers of young people gathering to spend leisure time.

5.2. Area 2: Larmot, El-Kanissa, El-Bassatine Neighborhoods

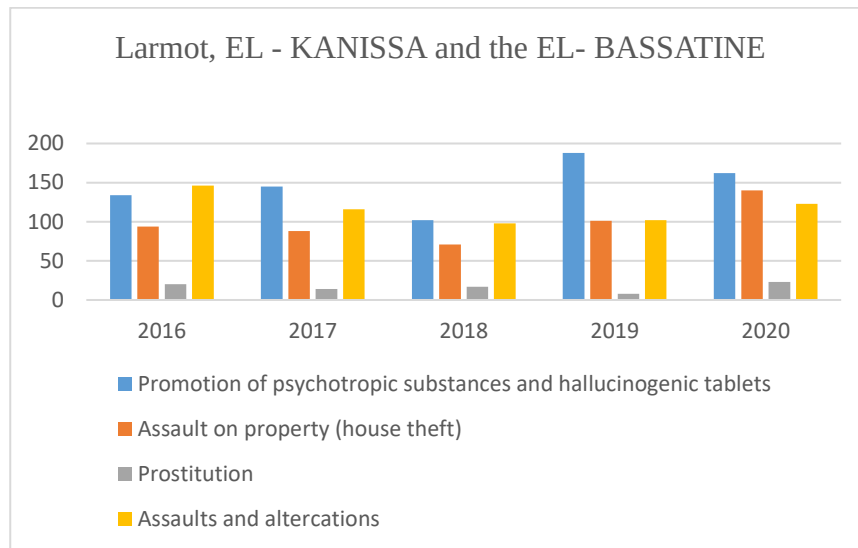
Table 2: Crime Volume in Larmot, El-Kanissa, El-Bassatine Neighborhoods (2016-2020)

Crime Volume In Larmot, EL - Kanissa And EL- Bassatine Neighborhoods								
Crime Pattern	Years					Total	Average	Percentage %
	2016	2017	2018	2019	2020			
Promotion of psychotropic substances and hallucinogenic tablets	134	145	102	188	162	731	234,667	39
Assault on property (house theft)	94	88	71	101	140	494	98.8	25

Prostitution	20	14	17	8	23	82	16,4	4
Assaults and altercations	146	116	98	102	123	585	117	32

Source: Tebessa Central Security Information and Public Relations Cell, 2020.

Figure. 02 : Crime Volume In Neighborhoods: Larmot, EL - KANISSA And EL-BASSATINE



Source: Researchers' preparation

Drug trafficking is substantially estimated at 39%, especially among children, adolescents, and young people. Prevalence is due to security difficulty in these narrow-alleyway areas, plus increasing proportion of young people seeking material sources through drug sales. Drug dens exist in the church archaeological area where hiding is easy.

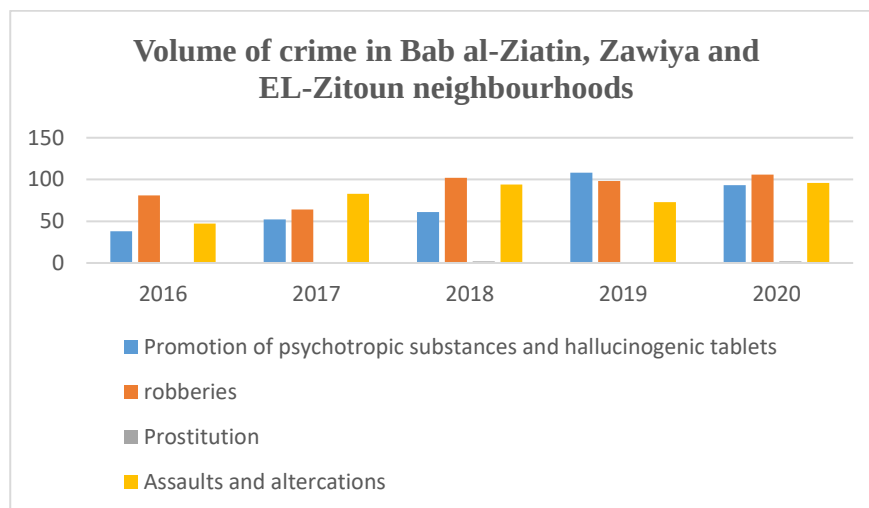
Altercations and assaults rank second with 31%, traced to neighborhood conditions lacking streets and roads, lowest recreational facilities, plus narrow homes and overcrowding. This has increased individual tension and entry into brawls. Theft crimes are characterized as mobile phone and bag theft, especially when strangers enter this area.

5.3. Area 3: Zawiya, Bab al-Ziatin, El-Zitoun Neighborhoods

Table 3: Crime Volume in Bab al-Ziatin, Zawiya, El-Zitoun Neighborhoods (2016-2020)

Crime Volume In Bab al-Ziatin, Zawiya and EL-Zitoun Neighborhoods								
Crime Pattern	Years					Total	Average	Percentage %
	2016	2017	2018	2019	2020			
Promotion of psychotropic substances and hallucinogenic tablets	38	52	61	108	93	352	70.4	29.3
robberies	81	64	102	98	106	451	150.3	37.5
Prostitution	1	0	2	1	2	6	1.2	0.5
Assaults and altercations	47	83	94	73	96	393	78.6	32.7

Figure 03 : The volume of crime in Bab al-Ziatin, Zawiya and EL-Zitoun neighborhoods



Source: Researchers' preparation

Theft crime takes the largest share at 37.5%. This can be attributed to these neighborhoods' ecological nature, characterized by rugged pathways and narrow alleys hindering police work. Additionally, market presence—including covered market for vegetables and meats, used clothing market, and bus station—contributes to snatch-and-grab operations for mobile phones, handbags, and wallets.

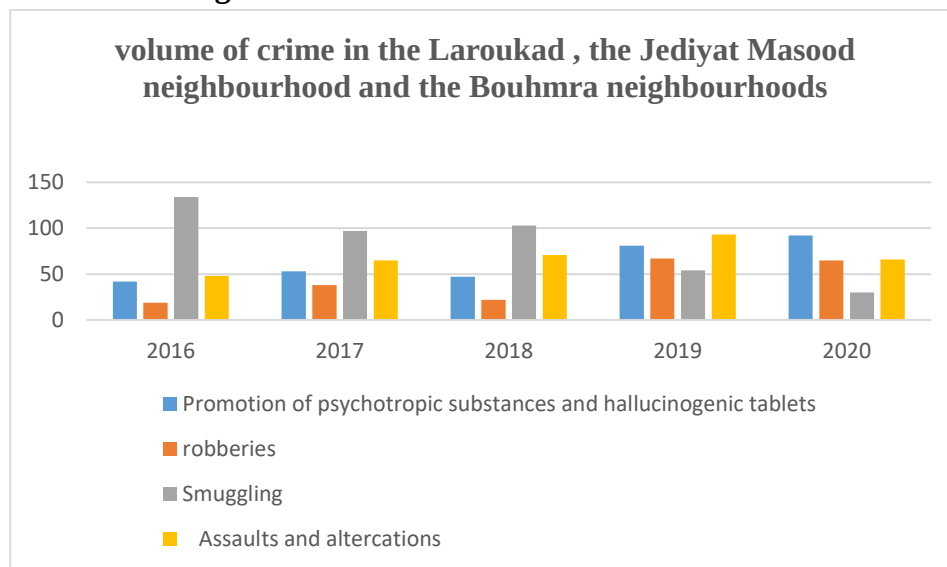
Fights and assaults are also high, estimated at 32.7%, explained by tense living conditions in old houses lacking comfort standards and poor sanitation due to waste container absence. Residents dispose of garbage in alleys, leading to anger and frustration. This frustration manifests through drug use and hallucinogenic pill distribution, ranking third.

5.4. Area 4: Jediyat Masood, La Rokad, Bouhmra Neighborhoods

Table 4: Crime Volume in Jediyat Masood, La Rokad, Bouhmra Neighborhoods (2016-2020)

volume of crime in the Laroukad , the Jediyat Masood neighborhood and the Bouhmra neighborhoods								
Crime Pattern	Years					Total	Average	Percentage %
	2016	2017	2018	2019	2020			
Promotion of psychotropic substances and hallucinogenic tablets	42	53	47	81	92	315	63	24.5
robberies	19	38	22	67	65	211	42.2	16.5
Smuggling	134	97	103	54	30	418	8306	33
Assaults and altercations	48	65	71	93	66	334	66.8	26

Figure 04: volume of crime in the Laroukad , the Jediyat Masood neighborhood and the Bouhmra neighborhoods



Source: Researchers' preparation

Smuggling crime represents the highest percentage, due to these neighborhoods' proximity to the road leading to the Tunisian border, leading residents to engage in diesel smuggling. Comparing statistics, we observe smuggling crime decrease at end of 2019 and 2020, coinciding with COVID-19 pandemic when borders were closed, preventing movement between the two countries.

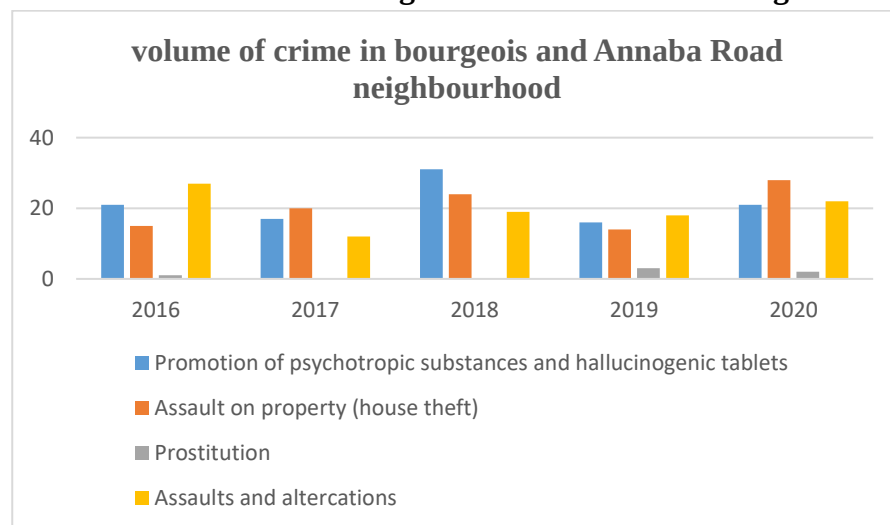
Brawls rank second at 26%, attributed to gangs controlling these neighborhoods. Often, gangs from other areas come for fights or drug exchange and trafficking. These gangs are characterized by violence, authority rebellion, and involvement in destructive activities. These neighborhoods are considered marginalized, where residents face poverty, unemployment, lack of cleanliness, inadequate urban infrastructure, and poorly maintained roads. Additionally, low education levels contribute, with many children dropping out of school early and turning to smuggling and drug use.

5.5. Area 5: Annaba Road, Bourgeois Neighborhoods

Table 5: Crime Volume in Annaba Road, Bourgeois Neighborhoods (2016-2020)

volume of crime in bourgeois and Annaba Road neighborhood								
Crime Pattern	Years					Total	Average	Percentage %
	2016	2017	2018	2019	2020			
Promotion of psychotropic substances and hallucinogenic tablets	21	17	31	16	21	106	21.2	34.1
Assault on property (house theft)	15	20	24	14	28	101	20.2	32.5
Prostitution	1	0	0	3	2	6	1.2	1.69
Assaults and altercations	27	12	19	18	22	98	19.6	31.5

Figure N05: volume of crime in bourgeois and Annaba Road neighborhood



Source: Researchers' preparation

Crime rates are low in these neighborhoods compared to other areas. This is attributed to residents' social status, neighborhood ecological nature, and housing conditions. Amenity availability, cleanliness, and limited movement psychologically affect residents, making them more peaceful and less prone to problems. Additionally, good financial situations contribute to lower crime rates. However, this does not mean these neighborhoods are entirely crime-free; they have witnessed various crimes such as drug use, fights, and thefts, albeit at reduced rates.

VI. Discussion:

6.1. Validation of Ecological Theory:

The findings provide strong empirical support for ecological criminology theories while revealing distinctive patterns specific to Algerian urban contexts. Crime patterns across Tebessa's five study areas are not randomly distributed but systematically linked to neighborhood ecological, social, and cultural characteristics.

The stark contrast between Area 5 (modern planned neighborhoods) and Areas 1, 2, 4 (popular, traditional, and peripheral neighborhoods) confirms the Chicago School's fundamental premise that neighborhood environmental conditions shape crime patterns. Area 5, characterized by adequate infrastructure, planned development, environmental maintenance, and middle-class residents, exhibits substantially lower crime rates across all categories. Conversely, Areas 1, 2, and 4—marked by inadequate infrastructure, overcrowding, environmental disorder, and socioeconomic disadvantage—demonstrate significantly higher crime incidence.

This pattern validates Park and Burgess's proposition that social disorganization arising from rapid urbanization and inadequate institutional development generates criminogenic conditions. Tebessa's popular and peripheral neighborhoods exhibit classic signs of social disorganization: high population turnover, ethnic and cultural heterogeneity, weak social institutions, and limited formal social control. Under these conditions, informal crime prevention mechanisms (community surveillance, adult supervision of youth, collective intervention against disorder) deteriorate, creating opportunities for criminal activity.

Louis Wirth's urban theory concepts—size, density, and heterogeneity—illuminate Area 2's particularly severe drug problems (39% of crimes). The combination of extremely high population density, narrow confined spaces, and inadequate recreational facilities has weakened traditional social bonds without replacing them with effective modern institutions. The deterioration of informal social control mechanisms in overcrowded traditional neighborhoods validates Wirth's prediction that urban density without adequate infrastructure leads to social disintegration and deviant behavior.

6.2. Crime Concentration Patterns: Hybrid Model:

Our findings reveal an interesting hybrid pattern combining elements from both centralization theory (Shaw & McKay) and peripheral concentration theory

(Brantingham &

Brantingham). In Tebessa, crime concentration operates through multiple mechanisms simultaneously:

Peripheral concentration (supporting Brantingham) appears clearly in Area 4, where proximity to the Tunisian border created opportunities for smuggling operations (33% of crimes). The marginalized status of these slum neighborhoods, combined with inadequate police accessibility due to poor road conditions and isolation, creates what Brantingham identified as "low protection zones" conducive to criminal activity. Geographic opportunity structures (border access) intersect with social marginalization to produce distinctive crime patterns.

Traditional neighborhood concentration characterizes Areas 1, 2, and 3, where high rates of drug trafficking and property crimes occur not at the geographic periphery but in deteriorated older neighborhoods. These areas feature narrow alleyways, archaeological sites serving as unsupervised spaces, and dense populations with weakened social cohesion. Physical environment characteristics—difficult police access, numerous hiding places, maze-like escape routes—create criminal opportunities despite central locations.

Commercial area concentration appears in Area 3, where markets generate property crime through concentrated targets (shoppers with cash and goods) and anonymity (crowd cover). Commercial activity attracts both legitimate customers and criminal opportunities, validating routine activity theory's emphasis on convergence of motivated offenders, suitable targets, and absent guardians.

This hybrid pattern suggests that in Algerian cities like Tebessa, crime concentration is determined less by simple center-periphery geography and more by convergence of opportunity structures, social disorganization, and physical environment characteristics. Different crime types respond to different ecological factors: smuggling to border proximity, drug trafficking to unsupervised marginal spaces, property crime to target-rich commercial areas, violence to overcrowded stressful living conditions.

6.3. Broken Windows Theory Validation:

Broken windows theory finds compelling empirical support across multiple study areas. Area 1's Mezab neighborhood exemplifies how visible environmental disorder—archaeological ruins serving as drug dens, Wadi Mezab used for waste disposal and drug consumption, vulnerable informal housing—signals absence of social control and attracts criminal activity. The 37.6% property crime rate correlates directly with physical disorder indicators.

Similarly, Area 4's anarchic slum construction, unpaved roads becoming impassable during rainfall, and absence of basic urban services (waste collection, lighting, drainage) create what Wilson and Kelling described as visual cues of lawlessness. Physical disorder communicates that authorities have abandoned these neighborhoods, emboldening criminal elements and accelerating decline in a self-reinforcing spiral.

Area 5 provides the positive corollary: well-maintained infrastructure, regular cleaning, functional lighting, and visible order create psychological deterrents to crime. The maintained environment signals active social control, resident investment, and effective guardianship—discouraging criminal opportunity-seeking behavior. Broken windows theory's crime prevention implications appear clearly: environmental maintenance and repair can reduce crime by signaling order and control.

However, our findings also suggest limitations of broken windows theory when applied mechanically without attention to socioeconomic context. Simply cleaning streets and repairing buildings in Areas 1 or 4 would likely have limited crime reduction effects without addressing underlying poverty, unemployment, and social marginalization. Physical disorder in these areas results from structural disadvantage, not resident apathy.

6.4. Cultural Factors and Delinquent Subcultures:

Our findings reveal distinctive cultural dimensions extending beyond physical ecology. The drug trafficking concentration in Areas 1, 2, and 3 (29-39% of total crimes) reflects not merely individual deviance but organized subcultural systems. Gang formations control specific territories, recruit adolescents and young adults, and operate collective criminal enterprises with their own norms, status hierarchies, and operational routines.

Albert Cohen's theory of delinquent subcultures illuminates these patterns. Youth in marginalized neighborhoods face structural strain between cultural goals (material success, respectability, consumer goods) and blocked legitimate means (educational failure, unemployment, discrimination). Middle-class standards dominate public discourse and media, yet working-class youth lack resources to achieve these standards legitimately. Facing repeated failure and status frustration, some collectively reject mainstream values and create alternative status systems where criminal success earns respect.

In Area 4, smuggling provides particularly clear examples. Successful smugglers gain local prestige and economic resources exceeding legitimate employment possibilities. Young males see smuggling as rational adaptation to blocked opportunities rather than moral failure. The dramatic smuggling decline during 2020 COVID-19 border closures demonstrates these activities' instrumental economic motivations rather than purely recreational or expressive deviance.

The concentration of drug activities around archaeological sites (Busta al-Khalia, church ruins) and marginal geographic spaces (Jabal al-Dakan, Wadi Mezab) demonstrates how delinquent subcultures exploit environmental features to establish operational bases beyond conventional social control. These spaces become "free zones" where alternative norms prevail.

6.5. Traditional vs. Modern Neighborhoods Paradox:

An unexpected finding concerns the relationship between neighborhood modernity and crime. Traditional neighborhoods (Areas 2 and 3), despite maintaining stronger kinship ties and cultural homogeneity theoretically protective against crime, exhibit high crime rates comparable to popular neighborhoods (Area 1). This paradox requires explanation.

Physical vulnerability provides one explanation. Traditional narrow alleyways and old construction, while fostering social intimacy through daily interaction, simultaneously create hiding places and escape routes. The same environmental features facilitating community cohesion also enable criminal activity by obstructing police access and providing concealment. Architecture designed for pre-modern pedestrian societies becomes problematic when crime control requires vehicle-based rapid response.

Ecological stress provides another explanation. Traditional neighborhoods suffer from overcrowding as extended families occupy aging structures designed for smaller household sizes. Infrastructure installed during colonial periods (if at all) cannot support current population densities. Inadequate sanitation, absent waste management, and cramped living conditions generate daily stress overwhelming protective effects of social cohesion. When physical environment becomes oppressive, cultural solidarity cannot compensate.

Cultural transition contributes as well. Traditional neighborhoods contain mixtures of long-term residents maintaining traditional values and newer arrivals from rural areas or other urban zones. This heterogeneity weakens consensus about behavioral norms. Additionally, younger generations increasingly adopt urban lifestyles and values different from elders', creating intergenerational conflicts and norm ambiguity. Neither traditional nor modern control mechanisms operate effectively during this transition.

The contrast with Area 5 highlights that modernity per se does not cause crime. Rather, planned development with adequate infrastructure, resources for maintenance, and middle-class residents creates conditions less conducive to crime than unplanned traditional areas suffering from deterioration and overcrowding without compensating advantages.

VII. Limitations:

While this study provides valuable insights into neighborhood ecology and crime in Tebessa, several limitations must be acknowledged:

1. Reliance on Official Statistics: Data reflect only reported and recorded crimes. The "dark figure" of unreported crime remains unmeasured. Reporting rates likely vary across neighborhoods based on police-community trust, crime severity perceptions, and cultural factors. Marginalized Area 4 residents may underreport due to police distrust, while affluent Area 5 residents may report more readily. Actual crime rates may differ from recorded rates, though comparative patterns across areas likely remain valid.

2. Limited Temporal Scope: Five years (2016-2020) provides a snapshot but may not capture long-term trends or cyclical variations. The COVID-19 pandemic during 2020 represents an anomalous year with border closures and movement restrictions affecting smuggling patterns particularly. Future research should extend temporal coverage to identify longer-term trajectories.

3. Lack of Individual-Level Data: Aggregate area-level data cannot address individual risk factors, offender characteristics, or victim experiences. We cannot determine whether offenders live in neighborhoods where crimes occur or travel from elsewhere. Detailed demographic information about offenders (age, education, employment, family background) would enable deeper socioeconomic analysis but was unavailable.

4. Geographic Specificity: Findings specific to Tebessa may not generalize to other Algerian cities with different ecological configurations, or to cities outside Algeria. Replication studies in Algiers, Oran, Constantine, and other North African cities would test generalizability.

5. Single Data Source: Exclusive reliance on police statistics without triangulation from victim surveys, court records, or community interviews limits perspective. Multiple data sources would provide more complete understanding of crime patterns and neighborhood dynamics.

6. Ecological Fallacy Risk: Area-level correlations between neighborhood characteristics and crime do not necessarily predict individual-level behavior. Not all residents of high-crime neighborhoods engage in crime. Individual and family risk factors also matter beyond neighborhood effects.

7. Limited Causal Inference: Cross-sectional ecological design limits causal claims. While we observe correlations between environmental conditions and crime, directionality remains uncertain. Does disorder cause crime, or does crime cause disorder? Longitudinal data tracking neighborhoods over time would strengthen causal inference.

8. Unmeasured Confounds: Analysis does not statistically control for potential confounding factors: population size variations, age demographics, police deployment levels, economic indicators beyond general socioeconomic status. Multivariate analysis would isolate neighborhood effects more precisely.

Despite these limitations, the study offers important empirical evidence of relationships between neighborhood characteristics and crime patterns in an Algerian urban context, contributing to North African criminology literature.

VIII. Conclusion and Recommendations :

This study demonstrates that crime patterns in Tebessa, Algeria, are systematically linked to neighborhood ecological characteristics, validating core propositions of ecological criminology theory while revealing contextual adaptations in North African urban settings. Crime is not randomly distributed but concentrates in specific

environments

characterized by inadequate infrastructure, environmental disorder, social disorganization, and blocked legitimate opportunities.

The findings carry important policy implications for crime prevention in Algeria and similar North African contexts. Traditional enforcement-focused approaches addressing individual offenders while ignoring criminogenic environments are likely to have limited effectiveness. Sustainable crime reduction requires ecological interventions addressing environmental conditions generating criminal opportunities and undermining informal social control

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