Open Access
Original paper

Budownictwo i Architektura / Civil and Architectural Engineering 25(3) (2026) 26053
https://doi.org/10.35784/bud-arch.9100

Spatial configuration and perceived privacy in open-plan offices: a case study in Oran, Algeria

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Received: 27.01.2026; Revised: 20.07.2026; Accepted: 20.07.2026; Available online: 15.09.2026

Abstract:
Open-plan office research has paid considerable attention to physical comfort, interaction, and collaboration. Far less is known about how spatial configuration affects privacy in specific cultural settings. This study addresses that question through a case study of an Algerian company in Oran, where a layout developed by a foreign partner was later altered by local management. The research used a quantitative correlational design. A Building-In-Use (BIU)-based questionnaire was completed by 109 employees across 14 offices, and the same spaces were analysed using the space syntax measures of integration, control, entropy, and choice. Spearman's coefficients showed negative associations between privacy satisfaction and integration, control, and choice, but a positive association with entropy ($r = 0.722$, $p < 0.001$). A descriptive comparison of one office in its original and modified forms found a lower maximum integration value and a slightly higher maximum entropy value after modification. In this case, more differentiated layouts with less exposure were associated with better perceived privacy. Our contribution integrates a sociocultural perspective on user privacy into the space syntax analysis of Algerian open-plan offices. The results remain specific to one company, and the concentration of users within the same offices limits both generalisation and causal claims.

Keywords:
open space office, user satisfaction, privacy, space syntax, Building-in-Use (BIU)

1. Introduction

The office emerged as a workplace separate from the industrial workshop, with its own furniture and spatial organisation. One definition describes it as a place where information is produced, documented, stored, and used [1]. It later became a subject of research in architecture, environmental psychology, management, and sociology. Across these fields, the central point is the same: spatial organisation shapes how people move, meet, communicate, and work together [1]

Globalisation and organisational change helped spread the open-plan office, which appeared in Algeria during the 1990s. The model allows flexible occupancy and easier communication, but it can also expose employees to conversations, telephone calls, keyboard noise, visual interruptions, and limited control over their immediate surroundings. Earlier studies have linked these conditions to poor concentration and reduced privacy [2-6]. The design issue, then, is how much openness a workplace can sustain without undermining control, concentration, and privacy.

Research on open-plan offices began to develop during the 1970s and 1980s, with early work on spatial organization, communication, and environmental satisfaction [4,7-9]. Interest slowed for a time, then returned in the 1990s and broadened to include organizational behaviour, environmental comfort, privacy, and spatial configuration [8-15]. The literature is now substantial, yet researchers still use different measures and analytical frameworks, especially when they compare users' perceptions with spatial data.

Office environments have received relatively little research attention in Algeria. Existing work includes Seksaf's study of window design, lighting perception, and user behaviour in offices in arid settings [16]; Belakehal's research on office daylighting [17]; Mezerdi's analysis of transparency in tertiary buildings in hot, dry climates [18]; Benammar's study of gender in open-plan offices [19]. Together, these studies provide a local point of departure, but none directly test the relationship between spatial configuration and perceived privacy.

Algerian architectural and social discussions often approach privacy through the idea of "horma", a term associated with inviolability, dignity, and protected boundaries. Traditional environments commonly express these values through gradual transitions between public, semi-private, and private areas. Contemporary open-plan offices offer fewer such transitions, and their shared work areas and long sightlines can conflict with established expectations. In this study, privacy means the ability to regulate access, exposure, and contact. Few studies have examined how that ability relates to workplace configuration; most comparable work concerns housing or healthcare settings [20,21].

A small group of studies has considered how open-workspace layouts affect spatial properties and privacy-related behaviour. Rashid and Zimring examined the links between office configuration, movement, co-presence, and perceived privacy [5], Hong and Yoo used space syntax and visibility graph analysis to study visibility, accessibility, and privacy behaviour [22], while Sailer and colleagues investigated the relationship between workplace configuration and satisfaction [23]. Guler and Demirkan later combined questionnaires with space syntax and visibility analysis, concluding that open-plan design requires a workable balance between openness, social interaction, and visual privacy [24].

Research that integrates spatial configuration, privacy satisfaction, and local sociocultural conditions into a single analysis remains uncommon. Baharetha, for example, studied open-plan offices in Saudi Arabia through questionnaires, interviews, and observations. Employees valued flexibility and collaboration, yet they also reported noise, frequent interruptions, and weak visual and acoustic privacy. The authors argue that an open-plan office works only when interaction and openness are adjusted to the privacy expectations of its setting [25].

This article studies the association between perceived privacy and the spatial properties of open-plan offices after changes introduced by local management. It uses a quantitative correlational case study that combines a BIU-based post-occupancy questionnaire with space syntax measures. Each respondent marked the location of his or her workstation, thereby allowing the satisfaction responses to be matched to the configurational values of the relevant spatial unit.

The hypothesis is drawn from space syntax theory and the privacy literature: spatial entropy is positively associated with perceived privacy satisfaction. In the present model, higher entropy denotes greater configurational differentiation and a broader set of spatial relations. Such a configuration may give users more scope to manage exposure and to avoid busy or visually dominant areas. The design is observational, so the hypothesis concerns association, not causation.

The article connects post-occupancy evaluation with space syntax in an Algerian workplace. Cultural context informs the interpretation, but it was not measured as a separate variable. Two questions guide the analysis. Which aspects of perceived privacy are associated with overall workspace satisfaction? Which syntactic measures are associated with privacy satisfaction? A final descriptive comparison considers how the original and modified layouts differ in accessibility and privacy-related spatial conditions. Our contribution integrates a sociocultural perspective on user privacy into the space syntax analysis of Algerian open-plan offices.

2. Literature review

2.1. Open-plan offices

An open-plan office is a large shared floor area arranged to facilitate information flow and allow spatial change. The model took shape in Germany in the early 1960s through the work of the Schnelle brothers and later became influential in the United States. Fischer and Vischer identify one of its main principles as placing interdependent groups close enough to communicate and exchange information efficiently [26].

Open-plan offices make efficient use of floor area, accommodate more occupants, and can be reconfigured with relative ease [27]. They may also support communication and, in suitable conditions, individual and organisational performance [28]. The same layout, however, has often been associated with lower environmental and job satisfaction [29], particularly where noise and lack of privacy persist [30]. Dissatisfaction with the work environment may also be related to perceived performance [31]. Gath-Morad and colleagues reached a similar conclusion: users respond not to layout alone, but to the combined effects of configuration, density, privacy, noise, and environmental comfort. High exposure and crowding tend to increase distraction and make concentration harder [32].

2.2. Privacy in open-plan offices

Privacy is best treated as the regulation of access to the self rather than simple physical isolation. Dictionary definitions usually stress separation from other people or freedom from observation. Environmental psychology adds control over interaction, information, and personal boundaries. Altman and Westin, therefore, connect privacy with personal identity and the management of contact with others [33].

People regulate privacy through behaviour and through the physical environment [34]. Distance, body orientation, visual barriers, and visible or implicit markers all help control interpersonal access. The size and meaning of these protective zones vary across individuals, cultures, and situations. Hall distinguishes intimate, personal, social, and public distances, and he treats territoriality as something expressed through both material and invisible boundaries [35].

For analysis, privacy can be separated into architectural, psychological, and social dimensions. Architectural privacy concerns the visual and acoustic conditions that allow people to limit exposure. "Desired privacy" is the amount of contact a person prefers at a particular time and for a particular activity [36].

"Achieved privacy" is the level of contact that the social and physical setting actually produces [36]. The fit between desired and achieved privacy depends on personal preference, the function of the space, the number and position of other occupants, and visual or acoustic links with surrounding areas. When the fit is poor, users often change their behaviour or mark territory to recover some control. Psychological privacy is partly an experience of architectural conditions [33], and territorial behaviour in open-plan offices shows how strongly spatial arrangements can shape that experience [29].

Social privacy is a person's ability to manage social contact. Burgoon locates this regulation in verbal and non-verbal behaviour, including speech, posture, eye contact, body orientation, and interpersonal distance [37].

Architectural privacy has visual and acoustic components. Visual privacy declines when employees remain continuously open to observation. Acoustic privacy concerns whether they can work or speak without being overheard by nearby colleagues [38]. Rashid and Zimring used space syntax to study the effects of layout on movement, visible co-presence, and face-to-face contact, and found a negative relationship between integration and perceived privacy [5]. Hong and Yoo reported that visual entropy helped predict privacy behaviour in open offices [22]. Sailer likewise linked visibility and perceived control to workplace satisfaction [23]. Guler and Demirkan found that highly integrated and visually exposed areas were associated with more distraction and less comfort, while stronger visual control was associated with greater satisfaction [24].

The literature has given more attention to environmental comfort and organisational interaction than to the social consequences of office configuration for privacy. Comparable spatial research has also concentrated more often on housing and healthcare environments [21].

2.3. Privacy in the context of Algeria

Environmental psychology generally defines privacy as a regulatory process. It helps people protect autonomy, reduce vulnerability, organise interaction, and maintain a sense of identity. The process is widespread, but its expression depends on context. Altman makes this distinction clearly: privacy is universal, while the behaviours used to achieve it vary across cultures and situations [33].

The idea of "horma" matters in the Algerian context because it refers to protected boundaries, dignity, and inviolability. Privacy within community life does not require withdrawal. It allows interaction to continue within limits that people recognise and accept. Applied to shared workplaces, this view points toward graded exposure and practical ways for users to regulate contact.

Baharetha examined open-plan offices in Saudi Arabia through a post-occupancy study based on questionnaires, interviews, and observations. Employees appreciated flexibility and collaboration, but identified noise, visual and acoustic exposure, and repeated interruption as serious problems. The study concludes that the advantages of open-plan offices depend on the balance between social contact, spatial openness, and privacy in the setting concerned [25].

In Algeria, as in other Arab-Muslim architectural traditions, spatial hierarchy has often mediated the passage between public and private domains. The principle can be seen at different scales, from the city to the dwelling. This article does not assume that contemporary offices reproduce historical forms. These traditions are used only as a context for reading locally added partitions, enclosed managerial spaces, and other spatial filters.

Little context-specific research has examined the cultural, social, and psychological dimensions of privacy in Algerian open-plan offices. A case study can begin to address that gap, but findings from one organisation cannot stand for Algerian workplaces as a whole.

2.4. Building in-Use (BIU) assessment tool

The Building-In-Use (BIU) assessment tool is a post-occupancy instrument for collecting standardised accounts of workplace experience [39]. It was developed to make users' evaluations comparable and useful in assessing building performance [40]. A short questionnaire records how occupants judge environmental conditions and spatial characteristics. When responses are aggregated across buildings, individual workplaces can be compared with reference patterns, making areas of strong or weak performance easier to identify. Repeated use of BIU has also produced a set of established measures for comfort, control, and satisfaction [39].

Bae and Charles Martin used post-occupancy assessment to compare design intentions with occupants' actual experience. They considered thermal and acoustic comfort, air quality, and lighting. Their results show that satisfaction depends on technical performance and on the degree of control users have over temperature, light, privacy, and other immediate conditions. They therefore present post-occupancy evaluation as a practical means of bringing users' needs into architectural design [41].

2.5. Space syntax tool

Space syntax treats configuration as part of social organisation, not as a neutral container for activity. A space gains meaning through its position within a network and cannot be read in isolation [10]. Patterns of visibility and access help explain movement, encounter, and co-presence. Highly accessible and visible areas generally encourage contact, while more segregated areas reduce it [42]. Studies have also related measures such as integration to observed occupancy and movement [43]. This study uses entropy, integration, control, and choice to describe the office layouts [44].

3. Methodology

This research used a quantitative correlational case-study design. It does not claim to represent every company or employee in Oran. Instead, it examines how privacy evaluations vary with spatial configuration inside one organisation. The case covers 14 offices with varying densities, workstation arrangements, enclosure levels, and forms of separation between functional units.

The analysis combines two quantitative sources. A BIU-based questionnaire recorded users' views of proximity, density, visual privacy, acoustic privacy, and overall workspace satisfaction. Space syntax then supplied configurational values for the spatial units containing their workstations. Linking the two sources enabled testing of exploratory associations between perceived privacy and spatial attributes.

3.1. Questionnaire

The questionnaire translated social, psychological, and architectural ideas about workplace privacy into survey items. The items drew on environmental psychology, the sociology of space, and research on work environments. Respondents also marked their workstation on an office plan, so each answer could be linked to the relevant spatial unit.

3.1.1. Proximity as an indicator of social privacy

The distance between workstations served as an indicator of social privacy. Hall treats interpersonal distance as one way people regulate access to one another. Distance alone does not determine privacy, but it affects the likelihood of interaction, observation, and interruption. The survey item, therefore, asked users whether workstation separation gave them enough control over contact with colleagues [35].

3.1.2. Density as an indicator of psychological privacy

Workspace density was used as an indicator of psychological privacy because identical levels of physical density can produce very different experiences of crowding and control. Stokols distinguishes the measurable number of occupants in a defined area from perceived crowding, which is a subjective response to social and environmental pressure. The survey, therefore, asked users how they felt about the number of people sharing their workspace [45].

3.1.3. Visual and acoustic privacy as components of architectural privacy

Visual privacy concerns control over observation and exposure. Sommer's work links visual control with psychological security and the appropriation of personal territory. The questionnaire asked whether users could work without feeling that colleagues were constantly watching them [46].

Acoustic privacy concerns exposure to speech, noise, and interruption. Kim and de Dear identify noise and poor sound privacy as major sources of dissatisfaction in open-plan offices. The corresponding question asked whether employees could work and hold conversations without being overheard by nearby colleagues [47].

Responses were recorded on a three-point ordinal scale: dissatisfied, moderately satisfied, and satisfied. The format was easy to complete, but the three categories provide limited measurement precision. That limitation is taken into account when interpreting the results.

The BIU questionnaire asks office occupants to assess seven aspects of the indoor work environment: Air quality, Thermal comfort, Lighting quality, Spatial quality, Privacy, Internal office-noise control, External building-noise control. This study used the privacy and spatial items listed in Table 1.

Table 1. User satisfaction questionnaire on privacy. Source: authors

Concept	The dimension	The question	The measure
Indicators of architectural space	Workstation characteristics	Indicate on the map where your workstation is located?	The spatial position of the user's workstation
	User characteristics	Age The gender The status	The traits of the individual
Privacy Indicators	Social privacy	Are you satisfied with the distance between your workstation and that of your colleagues?	Proximity
	Psychological privacy	Are you satisfied with the number of people sharing the same workspace with you?	Density
	Architectural privacy	Are you satisfied with the ability for your colleagues to see you at any time? Are you satisfied with the ability for your colleagues to hear you at all times?	Visual privacy Acoustic privacy
satisfaction indicators	Privacy satisfaction	Are you satisfied with the degree of closeness with your colleagues?	Specific degree of satisfaction: Social Privacy
		Are you satisfied with the degree of density in your workspace?	Psychological Privacy
		Are you satisfied with the level of visual privacy? Are you satisfied with the level of acoustic privacy?	Architectural privacy
	Satisfaction with spatial configuration	Are you satisfied with your workspace?	Overall satisfaction level

3.2. Simulation

Space syntax analysis was conducted on the 14 open-plan offices. Each layout was represented as a network of convex spatial units linked by direct access. Convex analysis suits interior settings because it can describe relations among work areas, circulation spaces, enclosed offices, and service rooms, even when furniture or partial partitions define the boundaries.

A convex space is an area in which every point is visible from every other point. Once the plans had been divided into convex units, each unit became a node in the graph, and every direct connection, such as a doorway or opening, became an edge. The graph was then used to calculate the configurational measures.

The analysis yielded four continuous measures:

Integration expresses the accessibility of a spatial unit relative to the rest of the configuration. Higher values identify spaces that are more closely connected to the system and therefore more likely to attract movement and co-presence [44]. In the visual output, blue represents low values and red represents high values.

Spatial entropy describes the configurational uncertainty associated with a location. In Nourian's implementation, a high value indicates a less ordered set of relations and greater difficulty in predicting access from that space [44].

Control is a local measure of how strongly a space provides access to its neighbours. A high value marks a unit with a comparatively important role in regulating immediate access [42].

Choice is a global measure of how often a node falls on the shortest routes between other nodes. Spaces with high choice values are more likely to serve as movement paths through the configuration [42].

The same procedure was applied to each office in Rhinoceros 3D and Grasshopper:

- The plan was divided into interior spatial units according to function and mutual visibility.
- The area of each unit and the total office area were calculated in Autodesk AutoCAD.
- A representative point was assigned to each spatial unit.
- Directly connected units were linked to define the graph relationships.
- In Grasshopper 3D, points represented spatial units and curves represented direct connections.
- Each spatial unit was labelled according to its function.
- The total plan area was entered into the Grasshopper model.
- The space syntax component generated the spatial hierarchy, functional zones, and connection structure.
- The outputs were used to extract integration, entropy, control, and choice values.
- Each respondent's workstation was located within the corresponding office plan.
- The configurational values of the spatial unit containing each workstation were extracted for statistical analysis.

3.3. Data integration and statistical analysis

Participants marked their workstation locations on anonymised office plans. Each location was then assigned the integration, control, entropy, and choice values of its spatial unit. Several employees occupied the same unit or office, so some configurational values recur in the data. The correlations are

therefore exploratory and should not be read as independent causal effects.

Spearman's rank correlation was selected because the satisfaction measures were ordinal. Tests were run in SPSS at a significance threshold of 0.05, and probabilities returned as zero by the software are reported as $p < 0.001$. The analysis did not model the nesting of 109 users within 14 offices, a limitation discussed later in the article.

3.4. Case study setting

The case study concerns a company with several sites in Oran. Its offices were chosen because they illustrate how an open-plan model introduced by a foreign partner was later reworked to suit local managerial and operational conditions. This history makes the organisation useful for examining changes to an imported workplace layout.

Local managers gradually added enclosed managerial cubicles, filing cabinets, and plants between departments. The additions interrupted long sightlines and gave the functional zones clearer boundaries. They may correspond to local demands for privacy, but the available evidence cannot show that culture was the only, or even the stated, reason for the changes (Fig. 1).

The enclosed managerial cubicles also provide places for confidential work with less exposure (Fig. 2).

Fig. 1. Cabinets and plants used to separate work zones. Source: author

Fig. 2. Enclosed managerial cubicle. Source: author

3.5. Participants and sampling

The organisation and its offices were purposively selected because they offered useful variation in density, workstation layout, openness, proximity, and departmental separation. The study included 109 participants in 14 offices belonging to the same company. This is an in-depth organisational case, not a statistically representative sample of companies in Oran or Algeria.

Users in the 14 offices received the questionnaire. Of the 114 returned forms, five were removed because they were incomplete or internally inconsistent. The final analysis, therefore, used 109 valid responses, or 95.6% of the questionnaires returned. Since the total number of invited employees was not recorded, this percentage is not an overall response rate. The sample comprised 44 men (40.4%) and 65 women (59.6%) (Fig. 3). Participation was voluntary, workstation plans carried codes rather than names, and no identifying information appears in the results.

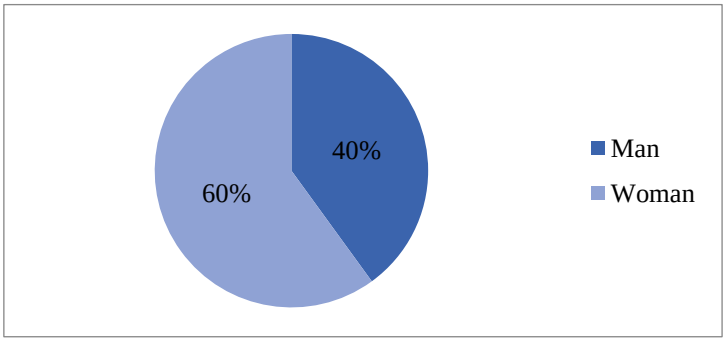

Fig. 3. Gender distribution. Source: author

Most participants were 30-39 years old (47.7%). A further 37.6% were 40-49, and 14.7% were aged 50 or above (Fig. 4).

The sample included administrative staff, architects, civil engineers, accountants, hydraulic engineers, and sales staff. Managers accounted for 24.8% of participants, and other employees for 75.2% (Fig. 5).

4. Results

4.1. Questionnaire results

Cronbach's alpha for the satisfaction items was 0.732. This is acceptable as a general indication of internal consistency, but the questionnaire combines separate privacy dimensions and several single-item measures, so it does not establish a single underlying construct. The descriptive results show that 54.1% of respondents were dissatisfied with visual and acoustic privacy. Dissatisfaction with proximity and density was also common, at 42.2% (Fig. 6 and Fig. 7).

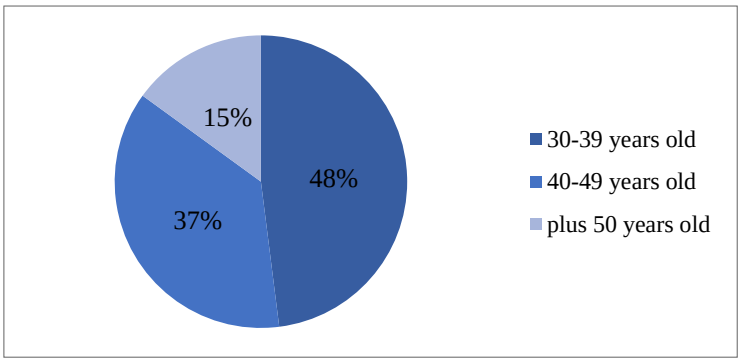

Fig. 4. Age distribution. Source: author

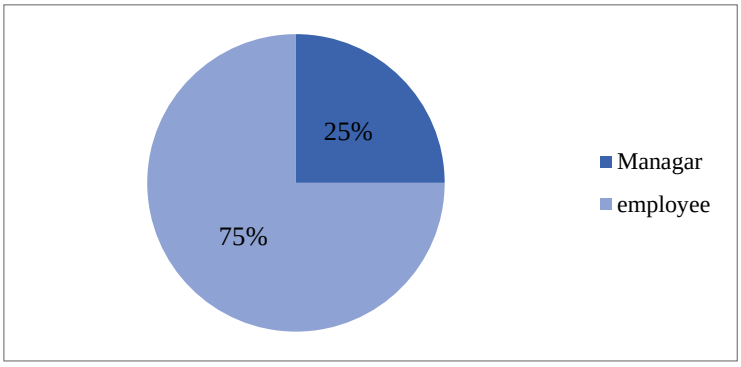

Fig. 5. Hierarchical-status distribution. Source: author

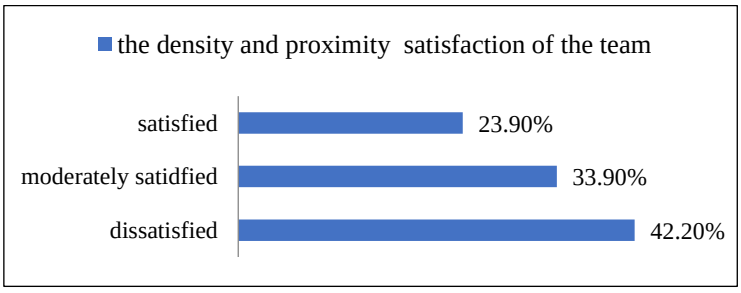

Fig. 6. Satisfaction with workstation proximity and workspace density. Source: author

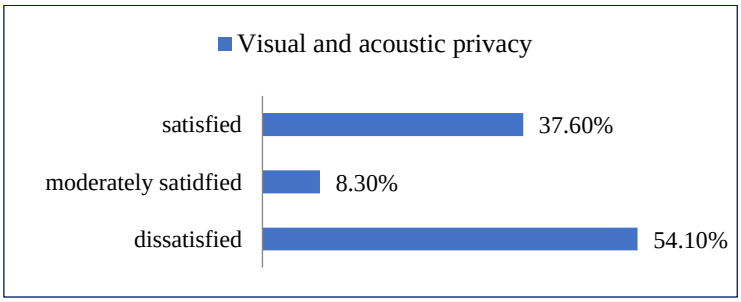

Fig. 7. Satisfaction with visual and acoustic privacy. Source: author

Spearman's rank correlation was used to test the relationship between overall workspace satisfaction and the ordinal privacy indicators. The significance threshold was 0.05.

Both relationships were statistically significant. Visual and acoustic privacy had a much stronger association with overall satisfaction than proximity and density did (Table 2). These are bivariate coefficients; they do not establish cause and effect.

Table 2. Spearman's correlation of privacy satisfaction. Source: author

		Density and proximity satisfaction of the team	Visual and acoustic privacy
Global satisfaction	Correlation coefficient	0.331**	0.892**
	Sig. (bilateral)	0.000	0.000
	N	109	109

Overall workspace satisfaction was positively related to both groups of privacy indicators. The first group combined proximity and density as measures of social and psychological privacy. The second combined visual and acoustic privacy as measures of architectural privacy.

The relationship between overall satisfaction and proximity-density satisfaction was moderate ($r = 0.331$, $p < 0.001$). The relationship with visual-acoustic privacy was very strong ($r = 0.892$, $p < 0.001$). This second coefficient suggests considerable overlap between how respondents judged architectural privacy and how they judged the workspace as a whole. Because both measures came from the same questionnaire and concern closely related experiences, the coefficient should be interpreted with caution.

4.2. Space syntax results

The Grasshopper 3D model generated outputs for all 14 offices. Office 6 is shown below as an example; the results from the other offices were retained in the statistical data set.

Figure 8 shows the justified depth graph for Office 6. Nodes represent convex spatial units, including workstation areas, enclosed offices, circulation zones, and service spaces. Edges show direct connections. Their vertical position records increasing topological depth from the selected reference space and makes the hierarchy of access within the layout visible.

Figure 9 shows the same configuration as a bubble diagram. Circle positions represent topological relationships rather than physical dimensions. Each circle is a convex space, and each line is a direct connection. Circle size refers to the configurational measure selected for the visualisation; it does not represent floor area.

Figure 10 shows the proportional distribution of zones in the Grasshopper output. Each segment corresponds to a convex unit and records its relative share of the selected output, not its physical floor area. The chart is included as a descriptive view of the model.

Together, the Grasshopper 3D outputs give each convex space a configurational profile. Integration identifies relative centrality and accessibility. Control shows which units regulate access to immediate neighbours, choice marks spaces that fall on frequent shortest routes, and entropy records configurational uncertainty and differentiation. Figure 11 presents these measures for Office 6.

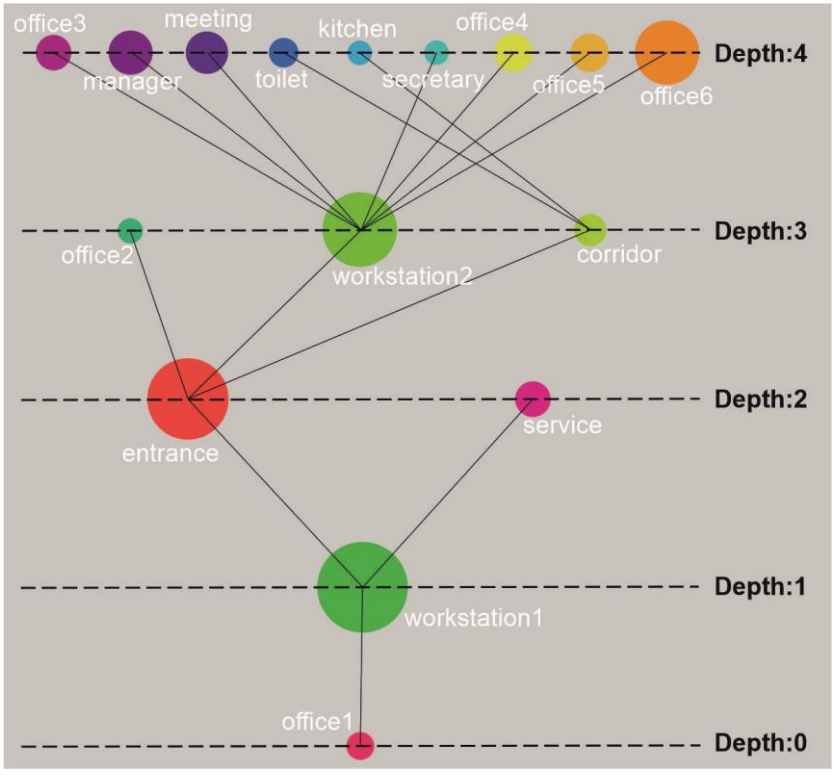

Fig. 8. Justified depth graph generated in Grasshopper 3D for Office 6. Source: author

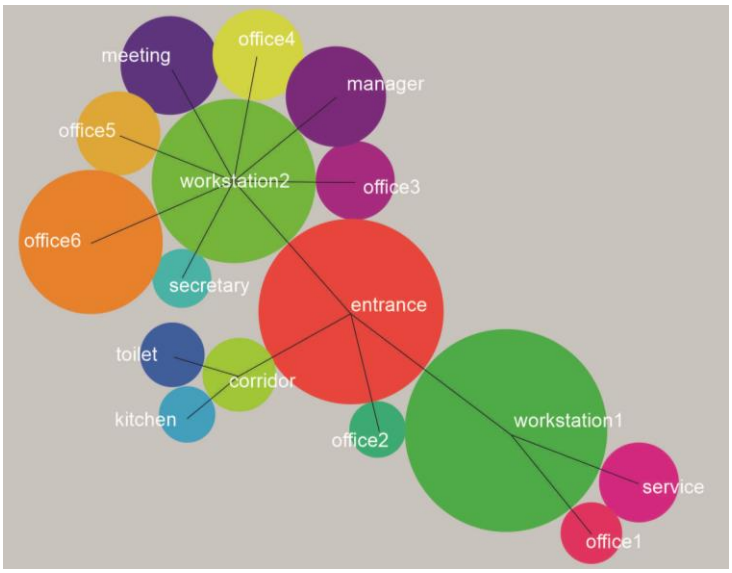

Fig. 9. Bubble diagram generated in Grasshopper 3D for Office 6. Source: author

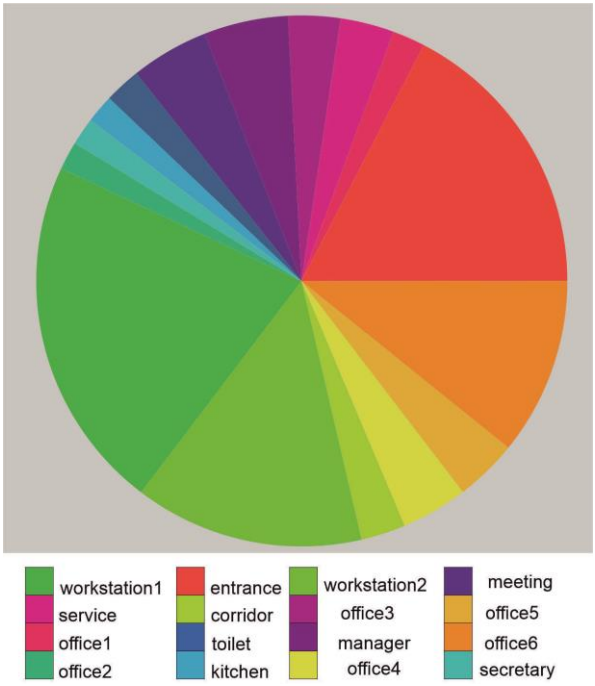

Fig. 10. Proportional zone chart generated in Grasshopper 3D for Office 6. Source: author

office2: 0.753	manager: 0.125	entrance: 0.872	service: 31
toilet: 0.753	meeting: 0.125	secretary: 1.074	office6: 31
kitchen: 0.753	service: 0.125	workstation1: 1.373	toilet: 31
office1: 0.753	office3: 0.125	corridor: 1.373	office5: 31
service: 1.054	office6: 0.125	workstation2: 2.75	office4: 31
secretary: 1.054	office5: 0.125	kitchen: 1.545	secretary: 31
office5: 1.725	office4: 0.125	toilet: 1.545	office2: 31
office4: 1.054	secretary: 0.25	office1: 1.545	kitchen: 31
office3: 1.054	office1: 0.125	office2: 1.545	office1: 31
manager: 1.054	office2: 0.125	office5: 1.725	meeting: 31
meeting: 1.054	kitchen: 0.333	office4: 1.725	manager: 31
office6: 1.054	toilet: 0.333	office6: 0.125	office3: 31
corridor: 1.255	entrance: 1.792	manager: 1.725	corridor: 31
workstation1: 1.255	workstation1: 2.25	service: 1.725	workstation1: 85
entrance: 2.396	corridor: 2.25	meeting: 2.25	entrence: 173
workstation2: 2.396	workstation2: 2.75	office3: 1.725	workstation2: 185

Fig. 11. Integration, control, entropy, and choice outputs for Office 6. Source: author

4.3. Association between privacy satisfaction and spatial attributes

Spearman's rank correlation was used to relate ordinal privacy-satisfaction scores to the continuous space syntax measures. With the significance threshold set at 0.05, all four bivariate correlations were significant. Integration, control, and choice were negatively related to satisfaction, while entropy was positively related to it (Table 3). Because some spatial values were repeated and participants were grouped within offices, these coefficients remain exploratory.

The strength and direction of the associations differed across the four spatial measures.

Integration had a very strong negative relationship with satisfaction ($r = -0.892$, $p < 0.001$). In this case, respondents whose workstations occupied more integrated units generally reported less privacy.

Control had a moderate negative relationship with satisfaction ($r = -0.389$, $p < 0.001$). Spatial units with a stronger role in regulating local access tended to be associated with lower privacy ratings.

Entropy had a strong positive relationship with satisfaction ($r = 0.722$, $p < 0.001$). In the model used here, greater configurational differentiation corresponded with higher privacy ratings.

Choice had a moderate negative relationship with satisfaction ($r = -0.407$, $p < 0.001$). Workstations in spaces crossed by more shortest routes tended to receive lower privacy ratings.

4.4. Descriptive comparison of the original and locally modified layouts

Office 6 was also examined in two forms: Layout A, the original arrangement developed under foreign management, and Layout B, the arrangement after local modification. The comparison concerns integration and entropy. It is a simulation of two layouts, not a longitudinal study of the same users before and after the change. The results describe spatial differences and cannot establish a sociocultural cause.

Layout A reached a maximum integration value of 2.615. Its configuration centred access and potential co-presence on a relatively dominant core, concentrating movement in a small number of areas. That pattern may increase passage and visual exposure around nearby workstations.

The maximum integration value in Layout B was lower, at 2.396. Access was spread across more spatial units, while the corridor formed by cabinets and plants retained a moderate value of 1.255. The modified arrangement, therefore, kept the functional zones connected without giving a single central space the same dominance (Fig. 12 and Fig. 13).

Table 3. Spearman correlations between privacy satisfaction and spatial attributes. Source: author

		Integration	Control	Entropy	Choice
Global satisfaction	Correlation coefficient	-0.892**	-0.389**	0.722**	-0.407**
	Sig. (bilateral)	0.000	0.000	0.000	0.000
	N	109	109	109	109

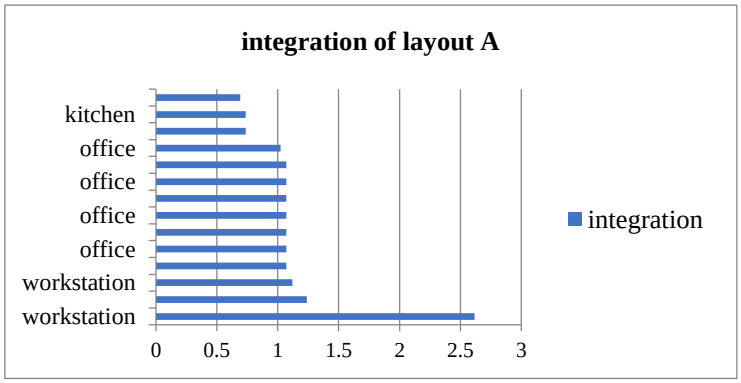

Fig. 12. Integration values for Layout A in Office 6. Source: author

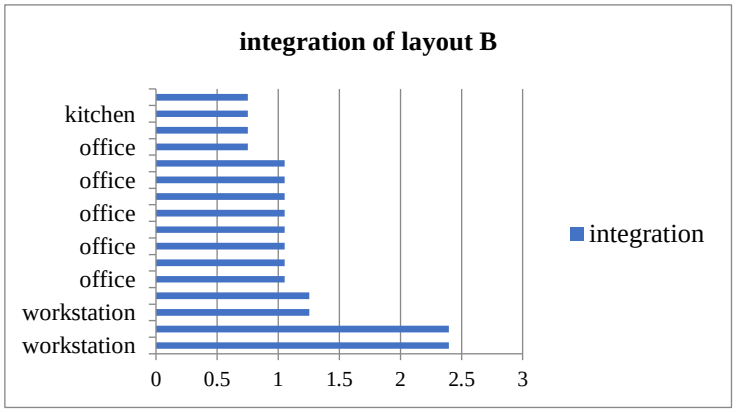

Fig. 13. Integration values for Layout B in Office 6. Source: author

Layout B also recorded a slightly higher maximum entropy value than Layout A, 1.725 compared with 1.702. The difference is small. What matters more is where the values occur. In Layout A, high entropy extended across several central functional spaces. In Layout B, it was concentrated mainly in enclosed or box-type units. The modified plan, therefore, separates shared circulation more clearly from protected work areas, although this remains a descriptive spatial reading rather than direct evidence of better privacy (Fig. 14 and Fig. 15).

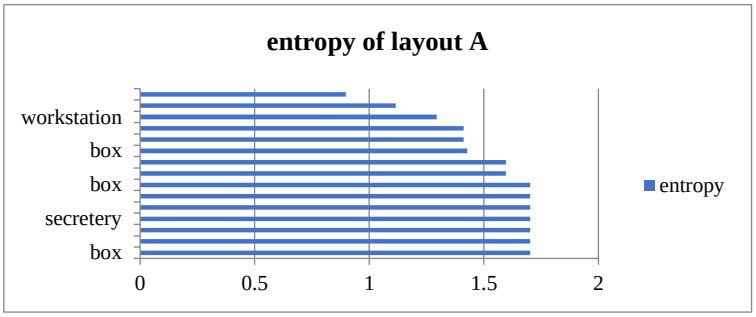

Fig. 14. Entropy values for Layout A in Office 6. Source: author

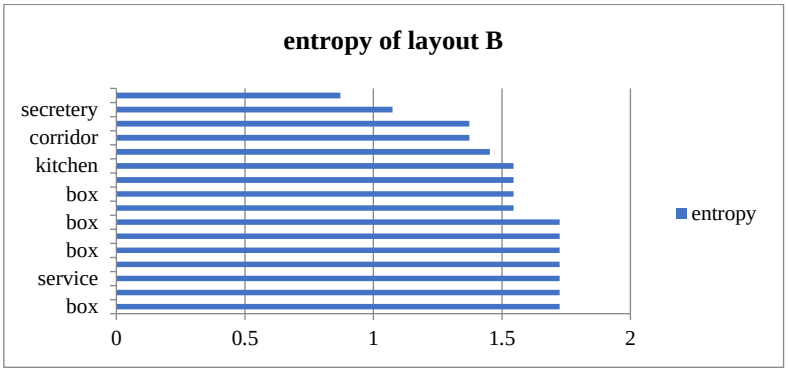

Fig. 15. Entropy values for Layout B in Office 6. Source: author

5. Discussion

The study examined perceived privacy and spatial configuration in 14 open-plan offices belonging to one organisation in Oran. BIU provided a structured account of users' experiences in the workplace [39]. and space syntax described the configurational position of their workstations. Used together, the two methods connect subjective evaluation with measurable spatial properties. This is a quantitative form of post-occupancy analysis; without interviews or thematic analysis, it should not be described as qualitative [39].

Privacy ratings were closely related to overall workspace satisfaction and also varied with the workstation's configurational position. The combination of post-occupancy evaluation and space syntax is useful for tracing these relationships. It does not, however, show that configuration is the only factor shaping users' experience.

Overall satisfaction rose with satisfaction in visual and acoustic privacy and, more moderately, with satisfaction in proximity and density. This pattern agrees with earlier work on interpersonal distance, environmental privacy, and workplace acoustics [35,48,38]. Brand and Smith argue that short distances and limited enclosure expose employees to observation and weaken their sense of control [49]. Lee and Brand make a similar point about unwanted sound and acoustic privacy in open layouts [50]. These problems can outweigh some of the collaborative advantages of open-plan work, although interaction can still support cooperation when the conditions are suitable [51].

The space syntax results also broadly correspond to the configurational work of Hillier and Hanson, Nourian, Rezvani, and Sariyildiz, and Altamimi [10,44,52]. Privacy satisfaction declined as integration, control, and choice increased. In practical terms, accessible, locally dominant, or frequently crossed spaces may leave employees more exposed and give them less control over contact. This reading is consistent with Nourian, Rezvani, and Altamimi [44,52]. Entropy moved in the opposite direction and was positively related to satisfaction. The positive association between entropy and satisfaction is consistent with the findings of Hong and Yoo, who identified visual entropy as a reliable indicator of privacy-related behaviour in open-plan office environments [22].

The comparison between Layouts A and B shows that the local modifications redistributed access and increased spatial differentiation in Office 6. Cabinets, plants, and enclosed managerial areas may give users more control over exposure without severing circulation or social contact. This reading is compatible with Baharetha's argument that open-plan offices need to balance openness, interaction, and privacy within their local setting [25]. The data, however, do not include direct measures of cultural values or interviews with the people who made the changes. Hierarchy, storage, functional separation, acoustics, and confidentiality are all plausible explanations. The alterations are therefore best described as locally introduced adaptations, not proof of a specifically sociocultural design mechanism.

6. Study limitations and research implications

The results must be read within several limits. The study concerns one company selected purposively, so it cannot represent all offices in Oran or Algeria. The 109 respondents were grouped within 14 offices, and several shared identical

spatial values. The bivariate correlations, therefore, fall short of full independence. Measurement is also constrained by the three-point response scale and by the use of single or combined items for complex aspects of privacy. The analysis did not control for hierarchy, job type, office size, objective density, acoustic conditions, or access to enclosed rooms.

Further studies should include several organisations, cities, and use validated multi-item privacy scales, document translation and pilot testing, and apply multilevel or cluster-robust models. Interviews and systematic observation would also be needed to understand how employees and managers interpret "horma", privacy, hierarchy, and local adaptation. A longitudinal or quasi-experimental design could compare the same users before and after a change in layout. For designers, the present results point to practical measures: create graded levels of exposure, keep main circulation routes away from workstations where possible, provide rooms with acoustic protection, and involve users during programming and early design.

7. Conclusion

Within this organisation, perceived privacy was strongly related to overall workspace satisfaction. Visual and acoustic privacy had the closest relationship, while proximity and density showed a more moderate one. Integration, control, and choice were negatively related to privacy satisfaction; entropy was positively related to it. A workstation's position in the wider spatial network, therefore, matters to the way users judge privacy.

The comparison of the two versions of Office 6 points in the same direction. Lower central integration and clearer spatial differentiation produced a layout in which access and protected work areas were more evenly balanced. The study does not establish causation, and it does not define a general Algerian model. It does, however, show why open-plan offices should include distinct degrees of openness rather than a single undifferentiated field. Employees need practical control over sightlines, sound, movement, and interpersonal contact if collaboration and privacy are to coexist.

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