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Space and planned informality: Strong and weak programme categorisation in public learning environments

Cauê CAPILLÉ, Sophia PSARRA
The Bartlett, UCL, London, UK

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Abstract:
Public educational buildings – such as schools, libraries, research centres and museum galleries – have complex and often conflicting requirements in terms of their programming and functioning. On the one hand, they need to provide open and equal access to knowledge to various categories of users. On the other, they have needs that might restrict or condition the arrangement of space, movement and various activities. At the same time, social and technological changes cause these typologies to change from within so as to include the idea of learning as a form of socialisation. These shifts imply complex or conflicting spatial, programmatic and organisational needs and point towards a hybridisation of strong and weak programme organisation (Hillier, Hanson, Peponis 1984; Hillier 1996).

This paper looks at two public libraries in London: Kensington Central Library and Swiss Cottage Library. The questions studied through these libraries are: firstly, how these conflicting requirements of space, programme and use are manifested through their spatial structuring and social performance? Secondly, how do weak and strong programme aspects of these buildings influence their day-to-day functioning? Finally: what is the role of the space of these libraries in influencing the strengthening or weakening of the boundaries between these programmatic categories of activities?

It is argued that although both libraries are similar in scale and programmatic description, they have a crucial difference: their *spatial* structure. This difference exposed the influence of the spatial manifestation of programme on the *transpatial* definition of programme. The combination of the *position* of activities in the spatial layout and the *length* of the description of such activities are pointed as fundamental aspects to be observed regarding the influence of programme in the actual use of space – especially the potential in generating unprogrammed social encounters. It is found that the KCL leans towards the strong and formal end of this programmatic typology, being a library of an academic character. The SCL on the other hand, intensifies the informal and weakly structured aspects of this typology, functioning as a library-community centre.

Keywords: *Public libraries, strong and weak programme categorisation, spatial and transpatial dimensions of programme.*

1. Introduction: Library as information

Learning environments like public libraries have a two-fold purpose: firstly, they are educational buildings facilitating learning, and secondly, they accommodate public events of collective experience. The need for focused learning and concentration in libraries often contradicts the functioning of the building as a public gathering space that facilitates movement and social interaction. In order to understand how these buildings deal with these conflicting purposes it is important to examine how space creates boundaries or connections that weaken or strengthen the difference between them. These boundaries become crucial in contemporary society, where libraries are increasingly seen not only as places that deal with a visible content (mainly books), but also as spaces that structure the various ways in which learning can happen (Shoham and Yablonka 2008; Koch 2004). This paper analyses space, programme and use in two public libraries: the Kensington Central Library (KCL) and the Swiss Cottage Library (SCL) in London. More specifically, it focuses on how particular spatial properties in these buildings can influence the way in which they work as spatial and social environments and how they accommodate these conflicting purposes.

The paper starts with a brief revision of the programmatic changes that are currently taking place in libraries. It then proposes four main "purposes of the library" according to two factors: firstly, the relation between the users (visitors) and the space of the library; and secondly, the engagement of users with two main possible sources of educational content: the content housed inside the library (books, journals, periodicals, etc.), and a content external to the library, mainly offered by access to internet. Finally, it analyses the two libraries to explore how the patterns of movement and use form specific spatial practices that are influenced by the space of the libraries and their programmes.

1.1 Purposes of public libraries

Today libraries are becoming multi-functional places, housing in their premises many more activities than they did in the past. These activities were mainly about the organisation of knowledge and access to information. Since digital technology has offered everyone rapid and wide access to information, libraries have undergone programmatic transformations (Sears and Crandall 2010; Verheul 2010). This recent phenomenon was highlighted by Shoham and Yablonka (2008), who explored the role of library buildings in contemporary society, where information and knowledge does not necessarily come from the reading of books – which is seen by the authors as the 'original' or 'traditional' purpose of this building type. To understand how libraries are being transformed, they interviewed a number of professionals related to the construction of recent libraries in Israel and Europe (librarians, architects, sociologists, urban planners, etc.). Their study showed a recent tendency of libraries to expand their educational programmes to include uses that are more collective – such as meetings, events, or courses. The library is a repository of knowledge for an educational content. Aside to the educational purpose of libraries, the authors emphasise the importance for these institutions to represent a public message and convey "prestige": the library "symbolises progress, education and a positive image". It is also a cultural meeting place, 'like a public square', as some of the interviewed professionals explained. Finally, it is a political symbol, a materialisation of knowledge and the expression of the status it holds in society. This representation would be the main message in the construction of a monumental library, for instance. Therefore, it is clear for the authors that the contemporary public library is

being built for a variety of interests, which diverge from the original purpose to provide a place for the organisation of knowledge and focused learning.

Shoham and Yablonka observe that these expanded purposes might contradict the "library's essential content and the profession of librarianship", transforming its space into a "structure that just happen to house a library" (2008). In other words, these expanded purposes are related to the building's space and message it carries to the wide public instead of its programme. However, the authors remind us of the fact that the issues raised by contemporary libraries and the transformations brought to them by digital technology are not simple ones, as new (and enormous) libraries are still being built. In some sense, in spite of the digital access to knowledge, the resources invested by society in these new buildings demonstrate that the physical presence of libraries continues to carry great social value. However, as access to print matter becomes less significant, libraries are undergoing programmatic transformations. This can be best illustrated through the recent discussion on the transformation of the New York Public Library (by Foster and Partners). A great part of this library (consisting of shelves with more or less 3 million books) is currently being transformed into public spaces consisting of areas for studying and meeting. The discussion on this transformation – which featured in many papers of wide circulation[1] – clearly exposed two opposed groups. Those who defend the new project affirmed that the new scheme will make the Library more public, i.e. it will be accessible by a diverse range of users. The group that was contrary to the refurbishment sees that "the real library" is being transformed into a "fancy internet cafe".

What emerges from these discussions is that the social programme and purpose of buildings is often defined abstractly through language and rarely discussed in relation to different types of users, and how activities performed by users take place in space as spatial practices. These different purposes in contemporary libraries – physical access to information, virtual access to information and public gathering – define different groups of users (Figure 1): firstly, the users who visit the library for physically accessing books, information and educational content (Figure 1, letters A – for when the library functions as a lending library; and B – for when it functions as a reference library); secondly, those users who want to use the library for its space and various activities it offers regardless of its specific educational and informational content (Figure 1, letter D); thirdly, the users that come to the library because it provides access to internet (Figure 1, letter C), i.e. to a content that is external to the library as physical space. If visiting a library for the specific purpose of borrowing and reading books defines the traditional programmatic purpose of this building type, the question that arises at this point is: How is this

[1] *The Wall Street Journal, The New York Times, and New York Daily News.*

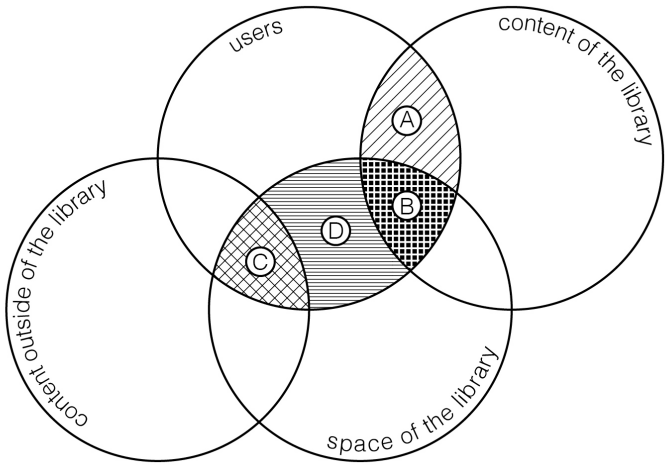


Figure 1. *Diagram exposing the different purposes of the library according to the relation of users with the content housed in the library, the content external to the library, and the space of the library.*

purpose combined with other programmes? What are the spatial dimensions of these conflicting activities, and how do different types of users perform these activities in space?

2. Library as space, programme and use

These questions about the public library refer to three aspects of space, that is, function, programme (or purpose) and use (or activity), all of which are often used interchangeably as though they are about the same thing. This misunderstanding might be explained by the fact that the boundaries of their definitions smoothly fade into one another. Outlining three main scales of space syntax analysis, Hillier (1996) exposes the differences between these three aspects. He explains that this analysis is about "first investigating space as a pattern in itself, then analysing its relationship to the distribution of categories and labels (non-interchangeabilities), then systematically observing its use" (Hillier 1996:194). The first analysis leads to the idea of *Generic Function*, a set of basic functional probabilities that the topological properties of the layout of space already present (1996:247-255). Hillier suggests that, if we disregard our cultural knowledge about architecture to observe how we use space, then we would be able to understand that this physical presence in space is about (or even requires) three generic functions: being able "to occupy space, to move about between spaces and to find buildings intelligible" (1996:258). He explains that spaces in a complex already present a potential or probable generic function according to their topological differences, and even without any programmatic or cultural description related to them (1996:304-305).

The second analysis takes into consideration the distribution of activities and their relationship to the spatial organisation. This analysis leads to the description of the interfaces between users, especially how long this description is (i.e. by specifying a large rule set of activities, interfaces and their spatial realisation) and the extent to which it is embedded in space. This second type of analysis underpins the formulation in space syntax literature (Hillier et al 1984; Hillier 1996) that there are 'strong programme' and 'weak programme buildings'. These terms will be described and discussed in the section that follows in greater detail. The notion of the programme in space syntax terms refers, therefore, not only to the labels of activities in space (which is the conventional definition of programme) but also to the spatial description of social interfaces between people of an organisation. The interface between students and teachers in a school for example, depends on various labels such as "classroom" as well as to the position of the classroom in relation to spaces for circulation and those spaces occupied by teachers. The third and last type of analysis, observes the types of actual activities and the ways in which they take place in space. This type of analysis is fundamental for understanding the influence of the first two variables – the social probabilities and affordances of configurational characteristics of space and the programmatic descriptions of activities and interfaces – on the actual activities.

This methodology in three steps of analysis is largely used by space syntax research. It emphasises the position of spatial patterns in relation to use (e.g. Hillier et al 1996; Penn, Desyllas and Vaughan 1997; Doxa 2001; Koch 2004, Psarra et al 2007; Psarra 2009, Orellana 2012) and in relation to programme (e.g. Amorim 1997; Koch 2004; Orellana 2012; Psarra et al 2007). Some recent works (e.g. Psarra 2009, Psarra et al 2007; Sailer 2007; Koch and Steen 2012; Orellana 2012) contribute to this methodology by focusing on

the relation between programme and use. They focus on how programme influences users' movement by working as an attractor (Sailer 2007); how different patterns of movement create particular spatial practices (Koch and Steen 2012); and how the precise or imprecise definition of activities in time create different patters of use (Orellana 2012). Of particular relevance to the questions raised by this research are both Orellana's and Psarra et al works. The first focused on a detailed study of use patterns as a way to describe strong and weak aspects of programme in St. Pancras Station in London. The contribution of his work to this paper therefore is in using detailed empirical data of user activity to provide precise descriptions of strong and weak programme aspects of a building. Psarra et al (2007) work focuses on understanding how the organisation of the exhibition content of the Museum of Modern Art (MoMA) in New York is mapped in space, and how the public then visits this content. The main contribution of this work to this paper is in understanding the mapping of a programme in space as fundamental aspect to be analysed. Therefore, similarly to these studies, this paper aims to understand firstly, how space, programme and use are manifested through the spatial structuring and social performance of the two libraries. Secondly, it addresses the problem of how weak and strong programme aspects of these buildings combine in their day-to-day functioning.

2.1 Strongly or weakly programmed libraries?

In general, space syntax research considers the notion of programme as constraining the relationships between space and use. This means that, whenever there is no programme, use will probably follow the configurative laws of space (Hillier 1996; Hillier et al 1984). This idea starts with the problem that in buildings, in contrast to public urban spaces (Hillier et al 1993), there is a predefined structure of how activities and interactions should take place, before the very act of inhabitation. This descriptive model can be very detailed or very short, an aspect that influences the extent to which a programme can transform the configurational potential of a building in creating movement and occupation patterns. This suggzests the definition of two opposed building types: strong and weak programme buildings (Hillier 1996). A strong programme building (1996:196-198) is the type that presents a very detailed and long description of interfaces and activities: everything that happens in the building is previously determined and, therefore, this type strongly conserves social practices. A weak programme building (1996:199-201), on the other hand, is the type that presents a non-detailed description of interfaces and activities, where Hillier suggests the idea of "all-play-all interface", whose movements "reflect the pattern of routes from all points to all other points" (1996:201), resembling, therefore, a public urban system. This second type can be considered as generative of social relations and practices as it overlays different social groups and practices, which enables the emergence of spontaneous and unprogrammed interfaces and activities – that is, interfaces that might not exist without this generative capacity of the spatial milieu (1996:201,255).

Hanson (1996) exposes the importance of the relation between programme and space in a study about the English law court building. She analyses the difference of use in the courtrooms and in the "unprogrammed corridors" that lead to them, observing that the latter are often the real spaces of negotiation – as they don't reinforce the strong segregation of interfaces between the actors of a trial. Hansons' main contribution is in showing that the courtrooms are strongly programmed whereas the back of stage part of the building is

weakly programmed. Therefore, the court building is neither strictly strongly nor weakly programmed. Her study also demonstrates that it is not only the length of the descriptive model of interactions and interfaces which is the aspect that informs if use is strongly or weakly programmed. Space plays an important role in the examination of this categorisation, especially if it is reinforcing the separation between sectors of a programme (Hanson 1996; Amorim 1997) or weakening these sectors by overlaying them in the same space.

Therefore, we might suggest that there are two main definitions of programme: firstly, there is "programme" as the description of activities of an organisation. Secondly, we can see programme as the distribution of such description in space. The first definition exposes the transpatial (Hillier 1996) aspect of programme, whereas the second exposes the spatial aspect of it. Therefore, this paper aims to understand how the changes currently happening in the transpatial programmatic descriptions of library buildings are embedded in the spatial structure of the two libraries under examination. Finally, it aims to clarify how the two libraries combine weak and strong aspects of programme (both transpatially and spatially defined) as well as how the spatial definition of strong and weak programme aspects in these buildings can be further clarified through a detailed study of users' activity. A hypothesis is that the internet and the wide range of activities libraries are introducing in their premises tend to turn this building type increasingly into a weak programme building (in the transpatial sense of the term) from the point of view of widening the range of programmes housed in libraries. How these buildings combine strong aspects of the programme (control, security, quiet reading, etc.) with an increasing range of weak public programmes (cafes, meeting spaces, etc.) is, therefore, a key aspect to be evaluated.

3. Methodology and the two libraries

This paper builds a detailed picture of the Swiss Cottage Library (SCL) and Kensington Central Library (KCL) using the following methods: firstly, spatial analysis of the layout using VGA analysis, convex analysis and J-Graphs; secondly, collection of empirical data of user activity (during 3 working days and 2 weekend days). Thirdly, statistical analyses of spatial variables with use rates. The empirical data collected concern snapshot studies of different types of activity and occupation, movement flows at thresholds and entrances and traces of peoples' paths in the library. These methods of analysis were organised in three kinds of comparisons between the two libraries: Space-Programme, Space-Use and Programme-Use.

Both case studies are public libraries in London and coordinated by their Councils (Figure 2). KCL is part of the Royal Borough of Kensington and Chelsea, while the SCL is under the coordination of the London Borough of Camden. Both were built in the same period (1960 and 1964, respectively) and are listed buildings (Grade II). KCL was designed by Vincent Harris and became listed by English Heritage, as a "remarkable and completely surviving example of Harris's post-war work in the classical 'neo Renaissance' idiom" (The National Heritage 1998). SCL was designed by Sir Basil Spence. It is described as "one of Spence's most accomplished civic buildings, and amongst the most ambitious architectural designs for a library found anywhere" (The National Heritage 1997). Although built around the same period, the two buildings present strong differences in terms of architectural ideology and

Figure 2a. *Views of both libraries: Kensington Central on the left (external and first floor view) and Swiss Cottage on the right (external and first and second floors).*

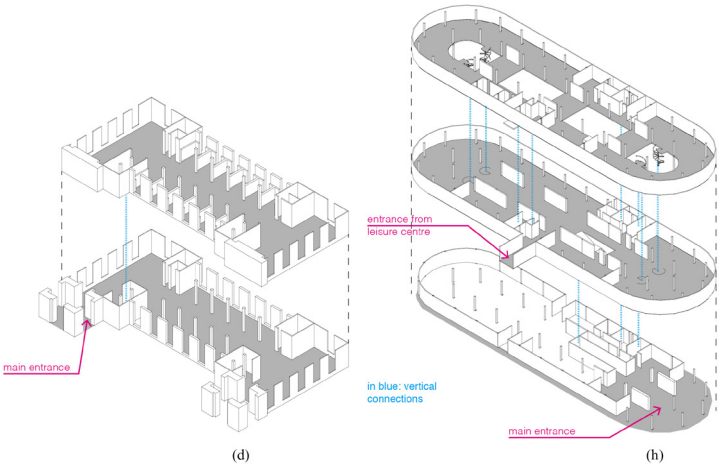


Figure 2b. *Entrances and vertical connections: Kensington Central on the left and Swiss Cottage on the right.*

style. The former is classical in its external shaping and interior configuration consisting of a main hall with a number of alcove spaces on either side. The latter has a complex "cigar-shaped plan" with an elliptical circulation path around a series of atria and bridges, which stretch over the voids. However, in spite of the differences along the classical-modern appearance, layout and style, both can be considered 'classical' in the sense of the long central axis that covers their plan from side to side and symmetrical layout. In Kensington this axis structures not only the geometry of the plan but also a long visual field and movement. In Swiss Cottage, the axis is emptied of occupation on the second floor working only as a geometrical and visual link connecting bridges and voids. The Kensington Central Library is currently being evaluated for an upgrade in its infrastructure, public and operational spaces (The London Borough of Kensington and Chelsea Cabinet, 2012; Wilson, 2010). The Swiss Cottage Library was remodelled in 2000-2003, when a Leisure Centre was built in its neighbouring site (creating a new entrance that connects directly to its first floor atrium). This refurbishment included a considerable transformation of its interior. Although the detailed study of these changes might be of great interest, it is not the focus of this paper, which considered only the actual plan and programme of both libraries (which, for instance, includes the computer rooms that couldn't be designed by the time the libraries were built).

3.1 Space and programme

The first type of analysis focused on understanding how the programmes of the two libraries are distributed in their space (Figures 3 and 4). This was studied through the comparison of the justified graphs of the two libraries (Figure 3b, c). These graphs are coloured firstly according to the programme

of each space (Figures 3b and 4b), and secondly according to their topological type as ‘a’, ‘b’, ‘c’, and ‘d’ spaces[2] (Figures 3c and 4c). The justified graph of the KCL shows that it consists of ‘a’ and ‘b’ types of spaces only, i.e. the graph resembles a tree. Looking at the programmatic labels of these spaces, we see that there is a clear division of the building into two separate floors in terms of content, influencing the purpose and character of the visit. The ground floor houses the lending library and the children’s library, while the first floor accommodates the computer room, the reference library and a section housing material on ‘local studies’. To access any of these programmatic sections, the user necessarily has to pass through one of the two information spaces/ issue desks. The children’s library, reference library, computer room, and local studies area are all dead-end spaces (a-type spaces), which means that these sections function as destinations only. Thus aside to a correspondence model between programmatic labels and floors, there is a hierarchical organisation of access to the various sections of the library.

[3] *Hillier 1996, 247-255.*

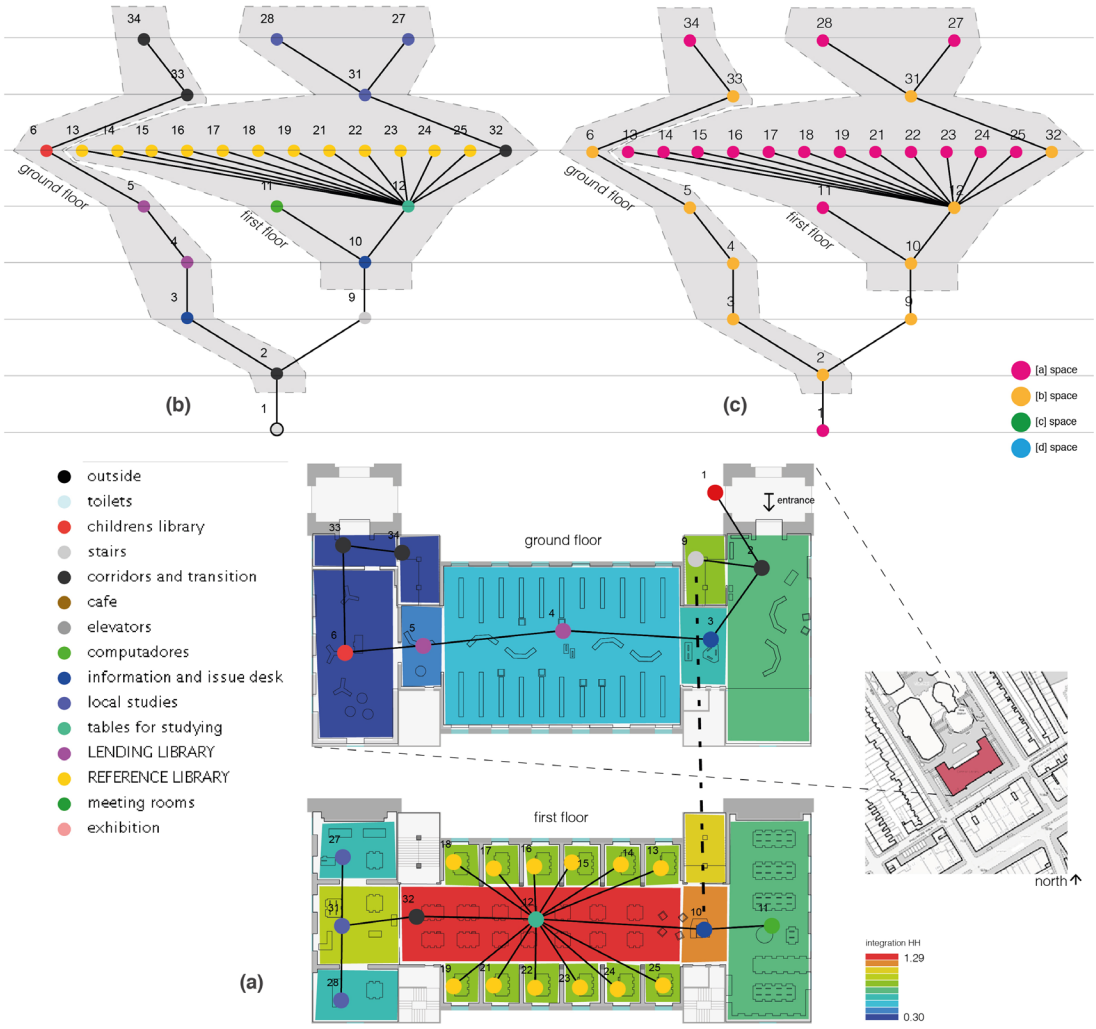


Figure 3. *Kensington Central Library’s (a) convex integration HH with programmes (circles); (b) J-Graph with programmes; (J-Graph with topological spaces (Hillier 1996).*

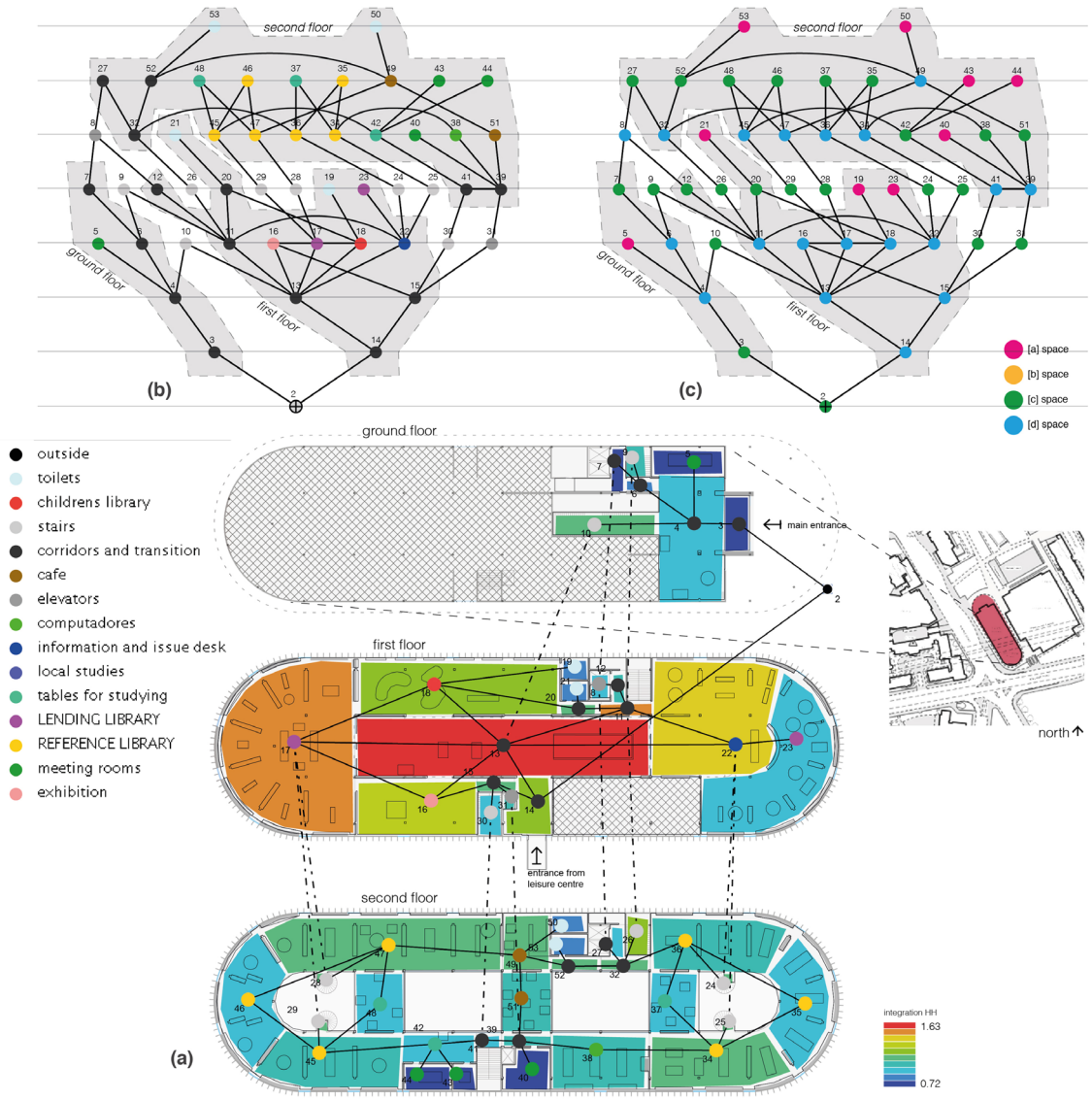


Figure 4. *Swiss Cottage Library's (a) convex integration HH with programmes (circles); (b) J-Graph with programmes; (J-Graph with topological spaces (Hillier 1996).*

The SCL is not divided according to programmatic labels and lending versus reference content, but to thematic organisation of contents: one of the extremities of the building (Figure 4a, left side of first and second floors) contains books in the category of 'Arts', while the other one those under the subject of 'Science'. A significant difference between the two buildings emerges at this point. The KCL uses the vertical division of the building to separate reference from lending books. The SCL on the other hand, uses the horizontal division of the plan to separate science from art, but mixes the other two categories through the visual and acoustic connection of the void between them. The majority of spaces are "c" or "d" types showing that the building is ringy and multi-permeable like an urban street network (Hillier 1996). This means that almost all spaces (82%) allow through movement. The programmatic spaces that in KCL were functioning as to-movement spaces play a completely different function in SCL. In the latter, the children's library is

a d-type space located in a much shallower place in relation to the entrance (3 steps, in contrast with 5 in KCL). This characteristic weakens the boundaries between this programmatic space and the other ones. Visitors who do not go to the children's library are likely to cross its space on their way between different programmes and spaces. In addition, children are likely to play and read in spaces adjacent to their library. The same phenomenon applies to the computer room, which lies on the way between the two sides of the reference library, breaking, therefore, the programmatic divisions between reference library and computer room (Figure 3b-c).

These differences between the two libraries remind us of Robin Evans' study of Renaissance Italian villas and 19th Century English houses (1997). In this study, Evans compares the 19th Century English houses with corridor, where a convenient room had only one door, with the 16th Century Italian villas, where "a convenient room had many doors" (Evans 1997:46). The 19th Century English houses separated two different circulation systems. One system linked the enfilade rooms used by the household owners. The other one connected the global system of movement with these rooms and was used by the servants. On the one hand, this system enhances the sense of concentration and intimacy of each room. On the other, it separates two social categories of people eliminating their accidental encounters (Evans 1997:54-55). Although libraries are different from domestic interiors, we can observe interesting analogies. Like the 19th Century English house, the spatial layout of KCL emphasises the specificity and seclusion of programmes, especially by differentiating them from the spaces of through movement. Like the 16th Century villa, the spatial layout of SCL presents spaces with various connections to other rooms. This pattern weakens the boundaries between different programmes and enhances the idea of gregariousness through all spaces.

Another aspect concerns the distribution of programme in space in relation to the convex integration analysis (Figures 3a and 4a). In KCL, the space with the highest value of integration (1.29) is the main study place, where the furnishing (tables and chairs) suggests a very specific use (Figure 2c). On the other hand, in SCL, the highest value of integration (1.63) is found in a multipurpose atrium space, where no actual activity is spatially programmed. This space houses a range of events (e.g. Tai Chi classes, Figure 2g) which concur with movement of visitors from one space to the other and the exploration activities of children in spaces that are contiguous to the children's library.

3.2 Space and use

The second type of analysis focuses on the patterns of occupation and movement in both libraries. Through the on site observations the following activities were identified: reading, studying, working, playing, searching, relaxing, walking, meeting, and eating (Figures 5, 6)[3]. These activities were analysed through "snapshot", "gate count" and "tracing" observations (Figures 5, 6)[4].

In the KCL, we see that movement based on the tracing study follows four patterns (Figure 5b). Firstly, one group of people (20%)5 enters the building, crosses the lending library and goes to the children's library. Secondly, 36% of visitors go straight to the second floor and either search for a place to sit and study (generally with their own book, computer or other material) or go to the computer room. Thirdly, 17% of visitors enter the building, explore its

[3] Nine types of activity observed: a)'Reading': only with reading material (book, magazine or newspaper); b)'Studying': with reading material and notebook or computer; c)'Working': only with computer; d)'Playing'; e)'Searching': for reading material; f)'Relaxing': without any reading or visible action or interaction; g)'Walking'; h)'Meeting': without reading material and interacting; i)'Eating'.

[4] On average, 106 people were observed per snapshot in KCL. "Working" is the most common activity in this library, representing 30% of all activities. This rate is followed by "studying" (20%), "moving" (18%), "reading" (13%), "searching" (9%), "playing" (4%), "relaxing" (3%) and "meeting" (1%). Regarding SCL, on average, 207 people were observed per snapshot. "Studying" is the most frequent activity (30%), followed by "moving" (18%), "working" (16%), reading (9%), "playing" (7%), "meeting" (7%), "searching" (5%), "eating" (3%) and "relaxing" (3%).

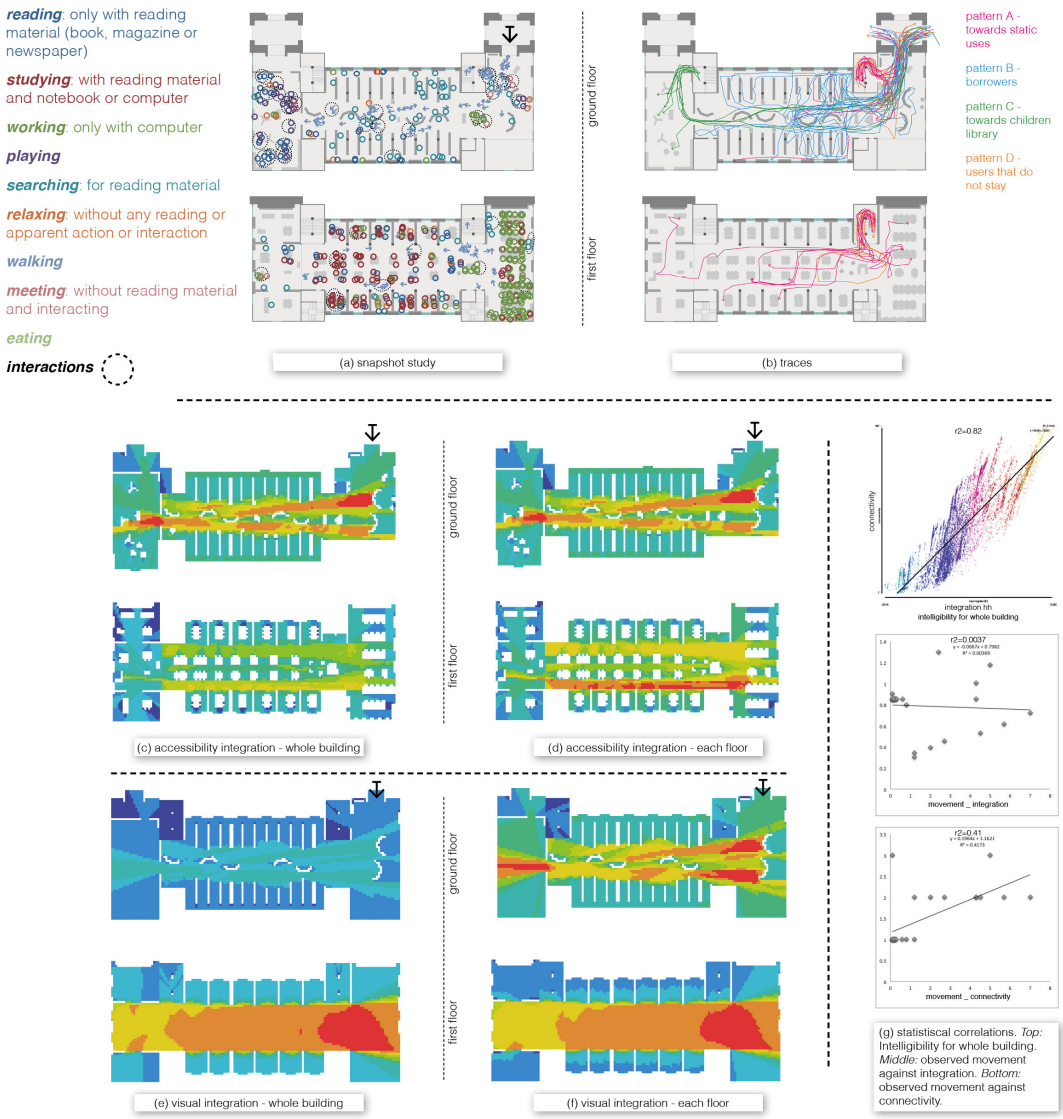


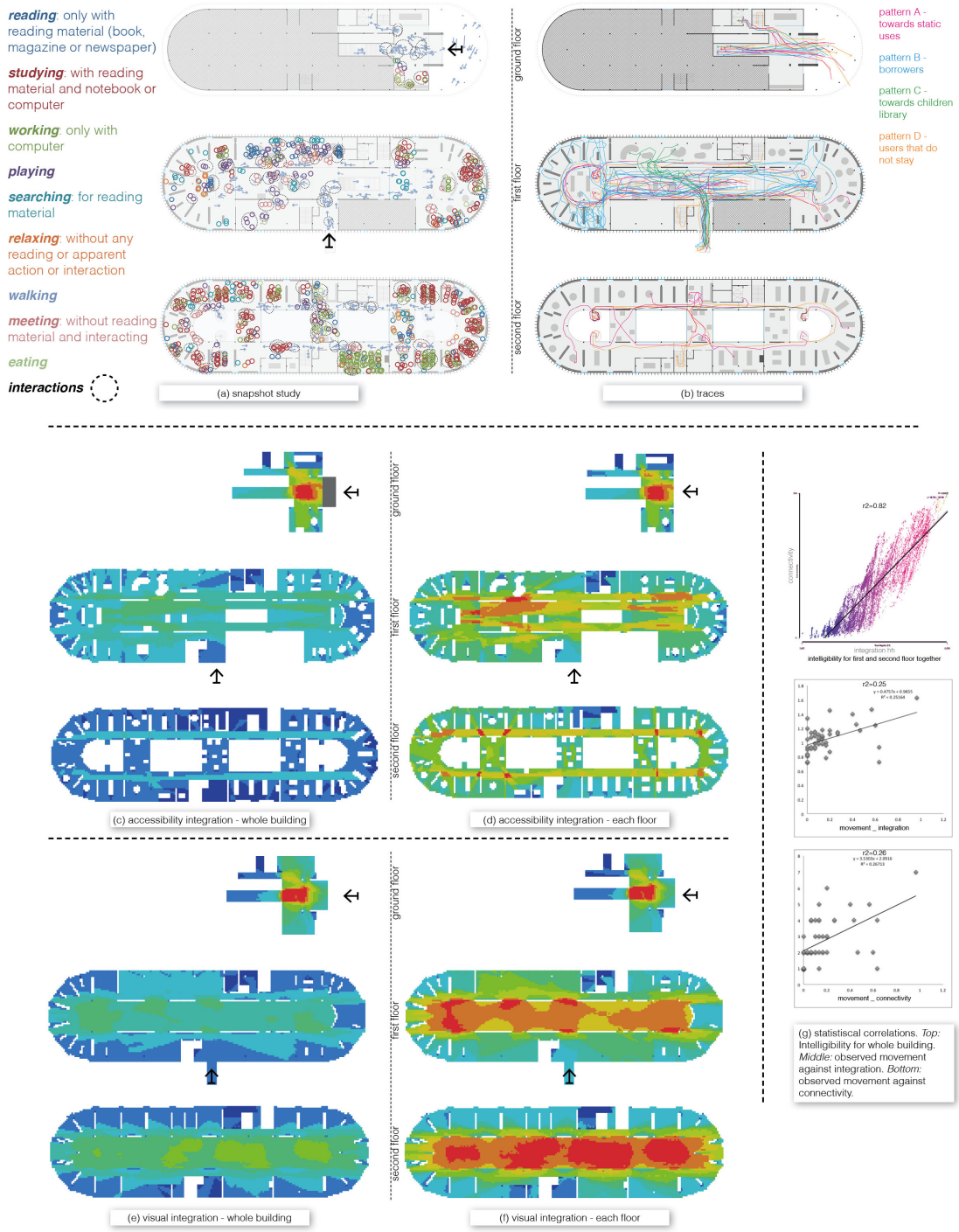
Figure 5. *Space and use analysis of Kensington Central Library.*

space and leave without searching for books or sitting to study. Finally, 27% use mainly the ground floor exploring the space between bookshelves of the lending library. This last pattern refers mainly to the activity of "searching", which has a high rate in the lending library (35% of all people observed "searching"[6]).

[5] *Based on tracing observation of 30 people paths for each library.*

In the SCL, movement traces are concentrated on the first floor, especially in the atrium space, which has connections with both entrances to the Library (Figure 2h)[7]. The four patterns of movement observed in the KCL occur in the SCL as well, but take place in a completely different way (Figure 5b). In SCL, visitors searching for books to borrow (23%) cross the space of the children's library. Those who enter the building in order to study or work (30% - in the computer room, reference library or the cafe) cross with the paths of those who go to the children's library and those who browse in the lending library. Finally, those visitors who enter to explore the library space without searching

[6] *Based on all snapshots observations.*



(g) statistiscal correlations. *Top:* Intelligibility for whole building. *Middle:* observed movement against integration. *Bottom:* observed movement against connectivity.

Figure 6. *Space and use analysis of Swiss Cottage Library.*

for books or performing any static activity (17%) also use the same spaces as the other groups. This intersection and concentration of movement paths might be one of the factors that explain the higher rate of social interaction in SCL in comparison with KCL. In the former, 31% of the people observed in all snapshots were involved in interactions, while the rate of interaction in the

second library was 16%. In the KCL, 40% of interactions take place inside the children's library. These interactions are mainly related to children playing or adults reading with children. If we disregard these types of interaction as not generated by space but as part of the transpatial description of this programme, the percentage of people involved in interaction in the entire building drops to 9.7%. These interactions are much quieter exchanges between people (in comparison with those that happen in the children's library)[8]. This behavioural pattern is highly encouraged by the administration of the library, which uses a sign in each sitting place of the reference library to request users to be quiet. The rates of interactions in the two libraries is also influenced by the average floor area per person. In KCL, the average is 21sqm per person, while in SCL this average is 14sqm. This aspect enhances the sense of concentration and intimacy observed in the use of space of the former.

In the SCL, interactions take place in all spaces forming three main patterns. Firstly, 35% of all interactions happen between sitting people (mainly in the lending and reference libraries, and in the cafe). A second pattern refers to interactions between children playing together (25%), which takes place in more spaces than only the children's library (e.g. lending and reference libraries, and exhibition room). A third pattern of interactions refers to people chatting in the corridors (22%). These interactions spread throughout the Library turning the building to a socially very active environment.

As both buildings are highly intelligible (Figures 5g, 6g), the differences in their movement patterns are not related to difficulties in understanding the location of activities. However, there are fundamental differences in movement patterns between both libraries, which might be influenced by their spatial differences. For instance, if we observe the pattern of movement of those visitors who explore the buildings' spaces for a while and then leave (yellow paths in Figures 5b and 6b) it is possible to observe interesting differences between both buildings. In SCL, this group explores the library by entering in spaces of programmed activities. In KCL, the same group visits only spaces designated as information/issue desk, covering 20% the length covered by the same group in SCL. This might be explained by the fact that in KCL, right from the entrance, one has a panoptic understanding of the whole building plan. This can be seen by the comparison between VGA analyses (Figures 5c, d, e and f), where accessibility integration and visual integration overlay in the same space, i.e. integration picks up the differentiation between circulation and occupation. On the other hand, when entering the SCL, one has to walk through the building to understand how activities take place. This movement occurs in the highly accessible areas (which do not correspond to the highly visible), which penetrates the spaces of specific programmes.

If we organise the types of activities (reading, studying, etc.) according to the four purposes of the library (Figure 7), we might be able to see fundamental differences between how the two buildings are being used. These concern the activities that do not make use of the educational content offered by the library or even from outside of it (represented in Figure 7 as purpose "D", which is associated to the activities "playing", "relaxing", "meeting", and "eating"). These are the weakly programmed activities, in the sense that they transpatially imply an unpredicted use of space. In the KCL, these activities represent together 7% of all activities. On the other hand, in the SCL, they sum 21%. In both libraries, reading and studying represent one third of all activities. However, these activities are distributed in completely different ways

[7] The entrance from the Leisure Centre is responsible for 40% of visitors to the Library. Although this factor might explain why the SCL works like a "library-community centre", it does not explain how it spatially creates such environment.

[8] It is worth noting that the children's library of Kensington Central Library is placed in very segregated space, while in Swiss Cottage Library the children library is directly connected to the integration core of the main floor of the building.

in the two buildings. In the KCL, reading and studying is highly concentrated in the reference library (Figure 5a); whereas in SCL, these activities take place throughout the entire building (Figure 6a).

In summary, these findings indicate that KCL offers a more intimate environment for focused learning than that provided by the SCL. The first library strongly emphasises the “core” and traditional activities of libraries, creating spatial boundaries, establishing behavioural rules and facilitating use patterns that separate core activities from others. On the other hand, the SCL distributes the diverse activities in space in a more homogeneous way, where the probability of finding people reading is almost the same as finding people meeting. The former is a formal library of the traditional kind, keeping social interaction away from the focused activities of studying and reading. The latter is a relaxed and informal library that by blurring the boundaries between formal and informal learning, between learning, children playing, recreational activities and creative practice, it encourages diversity of use and social interaction.

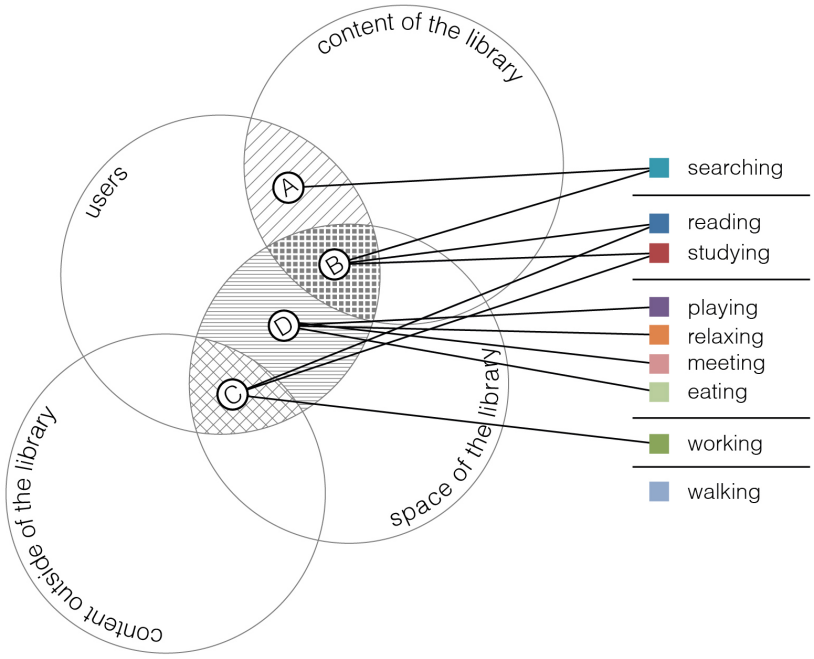


Figure 7. *Diagram representing the association of the types of activities observed in the library and the different purposes of the library (from Diagram 1).*

3.3. Programme and use

In order to understand how the labelling of spaces (spatial programming) is affecting the distribution of activities (reading, studying, etc.) in the libraries, this paper develops a mapping system to see whether there is a correspondence between both aspects. The hypothesis is that if there is a correspondence, i.e. if the spatial distribution of activity varies according to the programmatic labelling of spaces (or programmatic areas), then we might suggest that this is an indication of a strong programme building. On the other hand, if the pattern of activity does not vary according to programmatic labels, i.e. if the rates of distribution of activities remain the same for the entire building, then we might suggest that this is an indication of a weak programme building.

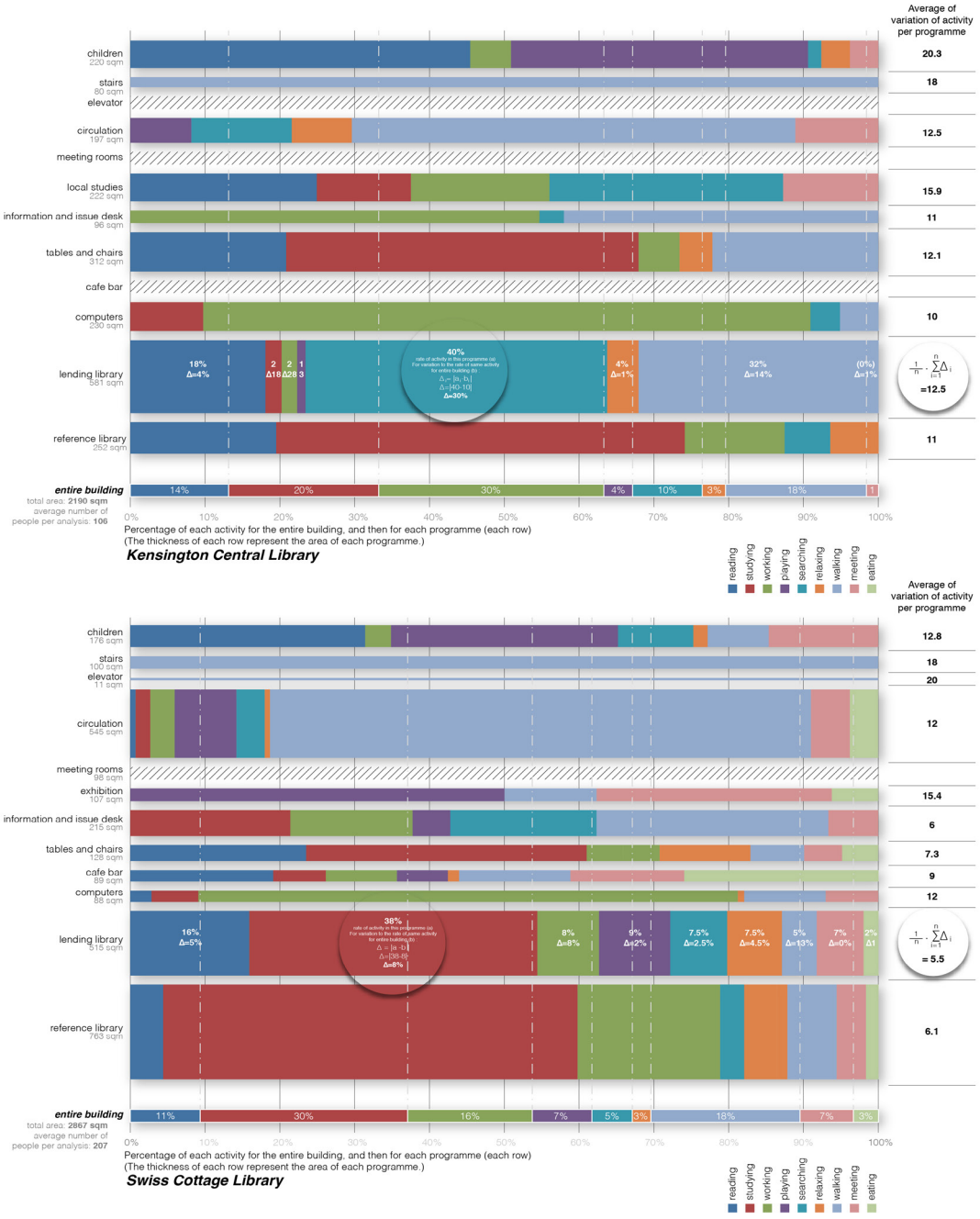


Figure 8. *Programme and use analysis of both libraries.*

This mapping system starts by calculating the average distribution of activities (studying, reading, etc.) in all the snapshot observations, for all spaces of one library. This is represented through the rate of each activity in relation to the total of all activities (Figure 8, bottom row for each library). Secondly, the snapshot plan is divided according to programmes. Then, each programme is analysed separately, following the same logic of the first step, in order to calculate the average distribution of activities according to each programme. This second part is represented by all the other rows. Thirdly, the bottom row

is considered as a reference, i.e. it is in relation to the pattern of distribution of activities in the entire building that we can observe the variations of activity according to programme (Figure 8, the white dotted lines project the rate values of the entire building). Fourthly, the variation of the rate of each activity in each programme is calculated against the rate of the correspondent activity in the entire building. This can be seen by the explanation in Figure 8 (indicated by the large transparent circles), which expresses the simple formula: $\Delta i = |ai - bi|$, where 'i' represents "each activity"; 'a' represents the percentage of that activity in a particular programme; and 'b' represents the percentage of that activity in the entire building. These Δi values are used as a way to measure the variation of distribution of each activity according to programme. In order to see the average variation of rates for all activities in relation to each programme a fifth step is taken, consisting of calculating the average of Δi values for each programme. This can be seen in the explanation in Figure 8, signalised by the smaller transparent circles, which expresses the formula of the average of Δi:

$$(1/n).\sum_{i=1}^{n}\Delta i$$

Where 'n' represents the total number of activities. Finally, these values are used as a way to measure the average variation of activity rates per programme.

This analysis exposed a trend also observed in the other types of analysis: i.e. activities are more concentrated according to programme in the KCL in comparison with the SCL. This is especially seen in relation to the lending libraries. In the KCL, the lending library is mostly used for searching (40%) and walking (32%). In the SCL's lending library, the use pattern follows the distribution of the entire building, with an average of Δi of 5.5 (as opposed to 12.5 in the KCL's lending library). We see similar patterns in relation to each value for all the other programmes (Figure 8, right column).This analysis also exposed that the programmatic labelling of spaces in the KCL has a strong effect on the distribution of activities that have an "informal" aspect in the transpatial description of their interfaces – especially meeting and playing. In this library, these two activities are strongly concentrated in specific programmatic areas. If we define potentiality and the generative dimensions of space as the possibility of space to afford social encounters, activities and co-presence in diversity, rates, types and scales other than those initially intended (by users or organisations), this paper captures the generative potential of space based on the above method. It is proposed that future research should further develop such methods so as to arrive at more precise definitions of strong and weak programme buildings.

4. Conclusion: strong and weak programme as a spatial and transpatial relationship

This paper proposes the notion of programme as a transpatial and spatial manifestation. The transpatial aspect defines purposes, activities and roles for different groups of people. In this sense, programme can be understood as a social script. The spatial dimensions of programme refer to the ways in which this social script is embedded in space through a pattern of distribution, affordances and labelling. Programme can have a strong influence on the

actual use of space through both its spatial and transpatial aspects. However, these two kinds of aspects differ in how they can perform such influence. As previously discussed, transpatially defined programme has a strong influence on use when it has a long definition of roles and activities between groups of people. On the other hand, programme as a spatial manifestation has a strong influence on use through the position of labels and affordances in the spatial configuration.

Therefore, the combinations of these two aspects of programme affect the definition of the categorisation of a building as strongly or weakly programmed. If we consider first the transpatial aspect of each programme in the two libraries, that is, as a script of actions in space, we can see that there are programmes that refer to a static use of space, and others that suggest an "exploratory" spatial utilisation. In a transpatial sense, "children's library" suggests an utilisation of space that is more exploratory than "reference library". Interfaces are not much defined in the first, whereas in the second, they follow a formal sequence. However, the observation of the spatial aspects of programme reveals another layer of understanding. In the SCL the programmes that suggest a "more exploratory" engagement with space are placed in a shallower position in relation to same programmes in the KCL. On the other hand, the programmes with a "more static" utilisation of space are split in the two sides of the building. This aspect requires users to walk through the building in order to reach the stacks and reading areas. This movement overlaps with other types of movement and activity, as the long axes that stretch from side to side intersect with axes along the other direction, forming rings of circulation ('d' spaces) that mix different categories of users along the same circulation system. Therefore, through the spatial positioning of programme, the SCL is weakening the influence of the transpatially strong programmes on the actual use of the building.

In the KCL, the distribution of programmes is completely different. Spaces in the library are connected through two trips (formed by 'a' and 'b' spaces), and the rings of circulation around tables are trivial covering the same programmatic spaces (Figure 3a). In a spatial system formed mainly by 'b' spaces, moving and occupying space have a strong functional sequence (Hillier 1996:254). Therefore, the position of the transpatially-defined programmes in a spatially sequential order characterises a spatially strong programming. In KCL, this sequence is used to conserve the "original" purposes of a library.

Therefore, we might suggest that the categorisation of a building as strongly or weakly programmed depends on how social scripts are embedded in spatial configuration, and this relationship will influence how use, movement and interaction take place in space or otherwise spatial practice. One aspect of spatial practice is social awareness and co-presence, which as the visibility integration shows are strong in both libraries. However, the characteristics of social awareness differ completely from one library to the other. In KCL social awareness is related to groups engaging in similar activity. This characteristic enhances the sense of concentration and seclusion for each space, where learning is a programmed practice. In SCL space mixes different user groups, and through this co-presence emphasises the idea of a more informal type of social awareness. In this library, socialisation is a fundamental form of learning.

In conclusion, we suggest that it is not only the inclusion of programmes that

changes the “traditional” purpose of libraries – as Shoham and Yablonka (2008) suggested – to the planned informality of contemporary public libraries. This phenomenon is also caused by the reorganisation of spatial functions of the traditional programmes of libraries towards a spatially weakly programmed experience, where social awareness is generative rather than conservative. Although reading and studying are different activities from congregating, interacting, playing, they are all forms of socialization. The changes characterising contemporary libraries can be associated with two phenomena: first, the decentralisation of print matter from access to information, and second the shift of pedagogical and learning approaches from the didactic model of learning to collaborative interactive forms of learning, supporting learner-led activities and innovative forms of thinking. As society is transforming from one when knowing ‘what’ is less important than knowing ‘how to’ – through networks and wireless devices – libraries and other learning environments will be increasingly developing in a manner similar to the SCL model. This model is close to what Rem Koolhaas refers to as ‘irrigating a site with potential’ (Lucan 2012), which means creating opportunities for things to happen in space rather than prescribing how things happen and where they should happen. Environments like the SCL show that instead of making physical space and typologies like libraries obsolete, information technology can have the effect of making them central spaces for learning, conferring interacting, all of which are essential factors for innovation through socialisation.

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