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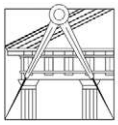

FACULDADE DE ARQUITETURA
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# DESIGN PARADIGMS IN PORTO'S PUBLIC AND COOPERATIVE HOUSING IN AND AROUND THE PORTUGUESE REVOLUTIONARY PERIOD:

## a systemic approach grounded on spatial analysis

TESE DE DOUTORAMENTO EM ARQUITECTURA
(DESENHO E COMPUTAÇÃO)


Doutoranda:
Catarina Ruivo Pereira

Orientadores:
Isabel Ortins de Simões Raposo (FAUL)
Tasos Varoudis (Bartlett, UCL)



Tese especialmente elaborada para a obtenção do grau de doutor
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# ABSTRACT

This dissertation studies a set of public housing estates in Porto developed in the period surrounding the Portuguese revolution, part of which have rarely been examined in architectural research. In doing so, it seeks to provide a global reading of this period that may represent a counterpoint to the criticism large-scale public housing development has been the target for decades, which often points out its urban and architectural characteristics as the root cause of continued patterns of social segregation in their residents.

In this sense, the dissertation first explores the question of how housing is both shaped by society and has the capacity to act back on social relations. It argues that the process through which this happens is twofold: the real estate market acts in class-differentiation, which determines who has access to the city and in which conditions; housing spatially organises socially defined human activity in the system of systems which comprise the house-settlement, as defined by Rapoport. Through a reading of different authors (Harvey, Bourdieu, Lefebvre), it is considered that this interaction most often takes a form favourable for or at least coherent with the reproduction of the relations of production, which have an impact on the ideological apparatus, which will, in turn, be materialised in architectural education, taste and action.

The dissertation relies on the internal duality of space syntax' methods to explore this idea of recursivity in the relationship between built space and society.

Firstly, it seeks to demonstrate that the spatial characteristics of domestic environments do have some impact on how people live. It does so through the systematisation of data available on family dynamics during the studied period and the preliminary exploration of how different patterns of organisation of domestic activities in apartment plans may be reflected in variances in the way people use the space of the house. It further explores how space syntax research has consistently been able to relate spatial attributes with patterns of space-use and articulates these attributes with the hypotheses of residential differentiation developed by Harvey. Through the examination of other authors (Marcuse, Bourdieu, Gros) the socio-spatial concepts of segregation, othering, hierarchisation, domestication and adaptability are developed and analysed in the studied cases. It is argued that it is through these concepts that housing acts as a regulator of patterns of interaction between individuals, groups and social classes in the city, and as such also has an impact on the conformation of different living experiences.

Secondly, syntactic analysis is used to retrieve design patterns from the set of built housing estates, which are then described according to the defined socio-spatial concepts. These are

compared across housing programmes to identify shifting or contrasting design paradigms, and informed by historical knowledge to link them to social and ideological transformations, as well as to understand the role of these housing estates as part of a process of social and urban change. It is shown that while these estates were initially built outside the centre and even purposely segregated, they are often located in what are today well-integrated areas of the city. A paradigm shift is identified as taking place during this period, as a trend can be detected in later housing developments of articulating the estate with its surroundings while maintaining a local community. It is demonstrated that Porto's growth was, to a great extent, articulated with the development of public housing and that this can only be understood globally: Housing - like all human-produced space - it is simultaneously a product of its time that has immediate social consequences; and also a set artefactual elements whose social meaning is transformed by changes that take place around them.

Keywords: Domestic space, Participatory housing, Patterns of house-use, Public housing, Spatial analysis.

# CONTENTS

# 4. PRELIMINARY ANALYSIS: THE SPACE OF THE HOUSE AND FAMILY DYNAMICS

## Introduction

This chapter will examine three documents that are exemplary of the research conducted on housing and ways of life that was mentioned in the previous chapter which, by focusing on intra-family relations and their transformation in its relation to the space of the house, offer different methodologies but one same approach to the question of housing development. 1) Portas' 1956 Social Housing and a Methodology for its Architecture (*A Habitação Social - Proposta para a Metodologia para a sua Arquitectura*), if preliminary, offered a systematisation of the theoretical assumptions that guided much of the National Laboratory of Civil Engineering's (*Laboratório Nacional de Engenharia Civil,* LNEC) work on housing in the following decades. 2) Portas' 1969 Functions and Area Requirements in Housing (*Funções e Exigências de Áreas da Habitação*) was the conclusion of years of research, and condensed in its propositions for minimal and ideal areas in housing much of the empirical and theoretical work conducted up to that point. 3) The completed 1984 version of the Survey on Urban Housing (*Inquérito à Habitação Urbana*) by Pereira and Gago, which assembled a set of questionnaires - and some analysis - that were conducted between 1969 and 1977 with the aim of becoming an empirical back-up to inform future housing development in the country. The latter was unique in its attempt to relate the spatial properties of apartment layouts to the way families perceived, used and appropriated domestic space. It was conducted to aid architects and planners in designing social housing for diverse and constantly-changing ways of life, by making architects' options verifiable through theoretical and empirical research. If this objective remained mostly unaccomplished until today, its analysis provides a set of relevant data to be explored in the scope of this dissertation in two ways:

1. In regards to how societal transformation affected families throughout these years, how they lived and how they were expected to live in the near future.

2. In regards to how institutions saw their role in designing not only for these families but in designing for their future. Designing for the future meant, in the immediate, designing for the emancipation of women at home, for a house whose leisure potential grew, and always providing more than the minimum deemed acceptable at each specific moment, by being aware of the

fleeting nature of conceptions of human dignity in constant transformation.

As such, the objectives of this chapter are threefold: 1) to systematise the framework through which institutional research that was deeply connected with housing production (particularly from 1969 with the creation of a State Department for Public Housing) saw the ongoing transformation of family and society and the role of housing in adapting or contributing to it. 2) To inform this work with sociological knowledge that may relate to the families who inhabited these estates, as well as how they lived and behaved in the space of the house. 3) To provide a preliminary exploration of the extent to which the domestic environment acts as a facilitator or inhibitor of patterns of behaviour and interaction that are relevant to this dissertation.

## 4.1. THE TRANSFORMING FAMILY AND HOME OF THE 1960s AND 1970s

### 4.1.1. THE EVER-CHANGING WORLD

The surveys that composed the Survey on Urban Housing were conducted in 1971, in the context of a perceived rapid alteration of life models "which recreates habits and needs, which implies a constant readjustment of ways of life."[11] (Pereira & Gago, 1984, p.3)

As the country furthered its industrialisation, research was concerned with the material questions that greatly influenced the use of architecture and the city: new technologies were altering techniques that were centuries old, new urban equipment changed the way of using the city and the house and, as mobility and transportation changed, accessibility itself was altered, and so were the relations and appropriation of "places and things".

A focus on societal transformation was reflected in the criticism of Le Corbusian-machine-à-habiter models, which arguably tried to, based on purely theoretical models, have the pedagogical function of "teaching families to live" (Pereira & Gago, 1984, p.9); teaching them how to abandon "old prejudice" and "bourgeois habits". Arguing that these pedagogical models had not worked - the overcrowding of houses did not allow for its proper utilisation, families carried rural habits with them as they were placed in new houses and used them accordingly - the authors proposed instead the production of empirical knowledge on how people lived, so that "the house does not

15 "(...) recriando hábitos e necessidades, o que implica um reajustamento constante das maneiras de viver." Translated from Portuguese to English by the author of this Dissertation.

translate anymore a schema defined by technicians, but the way of life detected through direct inquiry of the population and taking into account requirements and averages by class."[12] (Pereira & Gago, 1984, p.9)

Merely knowing how people live would not solve the points raised against modernist models and, while this does not become explicitly resolved in the text, Pereira and Gago seem to lean towards the idea of programming for the future, not the present, that was better explored by Portas. This idea was expressed in the proposition that architects should "programme for diversity", that they should search for typologies which could support, economically and in the best possible conditions, different ways of life, and also in the argument that surveys with such an objective "[…] should aim to be a reflection of the variety and richness of everyday life instead of reducing it to layouts inferred from the average, they should not be content with knowing what happens in the house, but try to understand what it means to 'live the city'":

> (...) We need data to reinvent man's home and to reinvent it we need to re-learn its meaning, understand its use, acknowledge its symbolism.[13] (Pereira & Gago, 1984, p.9)

This is also hinted at in a set of three questions that were proposed at the beginning of the text as something architects ask themselves: design what?, design for whom?, design how?, for which possible responses always presented ideas of growing flexibility and preparation for the future. Design what? Defined programmes or polyvalent city-buildings? Design for whom? For the population one knows, for the population one guesses will exist or for the population one wants, "resultant of the conjugated effort of integrated planning including education, economical, social and physical development, oriented towards a type of population defined as that we wish to reach"[14]? (Pereira & Gago, 1984, p.4) Design how? Determined forms for determined programmes where spaces have assigned functions, evolutive architecture exploring new technical resources, construction without assigned functions, thus elastic and polyvalent, or "building in a way so uncharacteristic, so disconnected from one sole programme that [space] can be used in all

**12** "A casa traduz já não um esquema decidido pelos técnicos, mas o modo de viver detectado através de inquéritos directos à população e considerado em termos de exigências e modos de vida médios por escalões de população." Translated from Portuguese to English by the author of this Dissertation.

**13** "Precisamos de dados para reinventar a morada do homem e para a reinventarmos temos de reaprender-le o significado, entender-çhe o uso, reconhecer-lhe a simbologia." Translated from Portuguese to English by the author of this Dissertation.

**14** "(...) resultante dos esforços conjugados de um planeamento integrado incluindo educação, desenvolvimento económico, social e físico, orientado por um tipo de civilização que seria definido como o que interessa alcançar" Translated from Portuguese to English by the author of this Dissertation.

"Underlying the study and the decisions it implied is the idea that there exists a significant correlation between the spatial characteristics of housing and the behaviour of individuals and groups within it, either because it hinders or prevents certain activities, or because it foments and encourages others.

That is why it is possible to define a contemporary notion of minimum as the group of conditions underneath which housing would, with significant probability, restrict the level of individual or group development allowed by society in a given point of its evolution.

It is easy to conclude that the severity of not satisfying minimum requirements set with this criterium is in the likeliness that it will induct an attrition element in a possible evolution, a fact that is well documented in large part of recent economic housing development that, irredeemably skimpy due to small budgets, are now partially obsolete, incapable of keeping up with growing requirements mostly due, as we will see, to the transformation of women's role, the increased schooling and independence in young people and the introduction of new motivations for group recreation inside the home."

**Nuno Portas, Functions and Area Requirements in Housing, 1969, p.8**[15]

different circumstances without it imposing or hindering?"[15](Pereira & Gago, 1984, p.4)

This idea was developed further in Portas. In Functions and Area Requirements in Housing, housing areas are seen as reflections of the social struggles of each historical moment. The necessary minimal areas for each given function, as functions themselves, are not an absolute given, but something that changes according to culture and societal evolution that have an impact on how families function:

> The family reflects and is the confluence point of the solicitations and contradictions of every historical moment. It might be the last stronghold to suffer the clash, but it also is, surely, the one which suffers the most its consequences - positive or negative. What has been called the family crisis (based on the crisis of youth, for example) is not more than the slow and tardy reflection of a powerful and yet undetermined historical transition.[17] (Portas 1956, p.21)

As society evolves, aspirational-needs quickly become necessary-needs, and for that reason, housing must be thought by taking into account the needs of the future, and not the aspirations of the past. When not possible, and so that at least the developed housing was adequate for the first families living in it, areas should be "(...) the best that can be achieved through maximum

**15** "(...) construindo de um modo tão incaracterístico, tão desvinculado a um único programa que se possa usar dela nas mais variadas circunstâncias sem que ela se imponha e o impeça?" Translated from Portuguese to English by the author of this dissertation.

**16** "Subjacente ao estudo e às opções que nele se tomaram está a ideia de que existe alguma correlação significativa entre caracteristicas especiais da casa e comportamento dos individuos e grupos que a ocupam, seja no sentido de constrangimento ou impedimento de certas actividades, seja como fomentador ou propiciador de outras. Daí que se possa definir uma noção actual de mínimo como o conjunto das condições abaixo das quais a habitação concorreria, com probabilidade significativa, para restringir o grau de desenvolvimento individual ou o grupo que a sociedade já permitiria uma dada fase da sua evolução.
É facil de concluir que a gravidade da não satisfação de uma exigência mínima fixada com este critério está na probabilidade com que se introduz um elemento de atrito numa evolução possível, facto bem evidenciado em larga parte das realizações de habitação do tipo económico dos útlimos lustros as quais, irremediavelmente acanhadas devido às pequenas economias pretendidas, estão agora parcialmente obsoletas, sem possibilidade de acompanhar um acréscimo de exigencias real, devido sobretudo, como se verá, à alteração do papel da mulher, ao acrescimo da escolaridade e de independencia dos jovens e ao aparecimento de novas motivações para o lazer em grupo dentro da habitação." Translated from Portuguese to English by the author of this dissertation.

**17** "A família reflecte e é o ponto de confluência, das solicitações e contradições de cada momento histórico. Poderá ser o último reduto a sofrer tal embate, mas é, também, com certeza, o que sofre mais as suas consequências - positivas ou negativas. O que tem vindo a chamar-se a crise da família (na base da crise da juventude, por exemplo) não será, assim, mais do que o reflexo moroso e retardado de uma poderosa e ainda indeterminada transição histórica." Translated from Portuguese to English by the author of this dissertation.

economical use of existing resources at a given time."[18] (Portas, 1969) The belief that housing developments would quickly go obsolete due to the permanent raising of housing standards through social struggle was explored in two ways in LNEC's research. On the one side, effort was put into the exploration and development of evolutive housing (and preliminary evolutive urban space) models, as well as different types of flexibility and polyvalence of the habitat; on the other, research on how people lived, on family dynamics, on their needs and aspirations, was often conducted with an eye not on what was stable, but on what was transforming.

### 4.1.2. WOMAN'S EMANCIPATION AND HER ROLE IN THE FAMILY

This underlying concern brought particular importance to the studying and understanding of the transforming role of women in society and its reflection within the house and the family. If, as seen above, Pereira and Gago did not believe that architects had a "pedagogical role" or that it was up to architecture to decide that women should be emancipated within the family, their work still had a significant focus on women, how they lived and what role they had in the family. As such, the authors argued that "it would be important to search for solutions which solved the isolation of the housewife"[19] (Pereira & Gago, 1984, p.39), and which valued the mutual presence of family members when at home, and in particular of women when occupied with domestic chores.

Portas (1959/2004, p.27) assigned to the awareness of the social evolution of women's role in the family the basis of "the revision of the concept of housing organisation undertaken in the last few years"[20]. Women were starting to work outside the house, they had better access to education and jobs, and so their role as mothers and housewives was quickly transforming. Children were now put in kindergartens, and domestic chores were starting to be shared, not only between women but also including sons and husbands. Women, now with their own jobs and financial independence, were seen as starting to feel a *de facto* equality:

> Women (who slowly become equal to men when it comes to access to education, even frequently superseding them in the struggle for life and the conquest of financial independence) transform traditional domestic roles, participating or administrating the

**18** "(...) as melhores forneciveis para um aproveitamento económico máximo dos recursos existentes num dado momento" Translated from Portuguese to English by the author of this dissertation.

**19** "Teria o maior interesse procurar soluções que resolvessem por um lado o isolamento da mulher doméstica (…)" Translated from Portuguese to English by the author of this dissertation.

**20** "O aspecto porventura mais revolucionário da moderna descoberta da família é o que respeita ao papel que nela a mulher desempenha. Ver-se-á que esta transformação e a sua tomada de consciência estão precisamente na base da revisão do conceito de organização da casa a que se tem procedido nos últimos anos." Translated from Portuguese to English by the author of this dissertation.

> couple's income, keeping up more with their husbands (who will little by little lose the privilege of a life aside or even hidden from the family), participating in political and union roles or in neighbourhood life.[21] (Portas 1959/2004 p.29)

Nevertheless, empirical research reported that women were still the ones almost exclusively in charge of domestic chores and taking care of children, and that was the primary reason why it was considered essential to make women "the protagonists of the space of the house: because we will insist against solitude, in the urgency of unhesitatingly treating space's organisation for the promotion of encounter, of cooperation and friendship; in the essential importance of placing at the centre of domestic life the woman who works hard and the few but precious moments in which family comes together at home."[22] (Portas 1959/2004, p.32)

If it is referred by Portas (1959/2004) that young couples, displaced, unstable and precarious, display closer, more honest and equal relationships, women are barely ever considered as the half of a couple. In Pereira and Gago's surveys, no questions were asked regarding the relationship between men and women, and Portas developed no hypothesis of spatial arrangements to favour life as a couple. Instead, even though it was acknowledged that household chores were rapidly transforming due to technological advancements and precooked meals, and that men and children were becoming more and more participative, it was also recognised that making the woman the centre of domestic life meant paying much attention to the kitchen. It was when treating the kitchen, its organisation, its relation to other spaces and its area, that women were mentioned the most.

To counter women's segregation in their own homes, Portas (1969) proposed three main guidelines for the house's spatial arrangement: 1) Kitchens should always be designed in order to accommodate more than one function and allow for a variety of activities, or be linked to alcoves or balconies that might be used for informal, social activities. 2) Kitchens should be linked to the living room, in order to guarantee women's participation in social activities, in particular because the appearance of televisions in households seemed to be moving to the living room family-gathering activities that used to take place in the kitchen. How this link should be developed was

**21** "A mulher (que lentamente se iguala ao homem no acesso a numerosos sectores da educação e do ensino, suplantando-o mesmo com frequência, na luta pela vida e a conquista da sua independência económica) transforma os papeis tradicionais no lar, participando ou admnistrando os rendimentos do casal, acompanhando mais o marido (que deixará pouco a pouco a regalia de uma vida à parte senão oculta da família) participando em tarefas políticas, sindicais ou da vida comunitária do bairro." Translated from Portuguese to English by the author of this dissertation.

**22** "Compreender-se-à agora por que a mulher vai assumir um papel de protagonista do espaço do habitat: porque insistiremos contra a solidão, na urgência em tratar o agrupamento resolutamente, como fomento do encontro, da cooperação e da amizade; na importância essencial em colocar no centro da vida caseira a mulher que trabalha duramente e os poucos mas preciosos momentos em que a família se encontra junta no lar." Translated from Portuguese to English by the author of this dissertation.

a complex question, to which Portas presented a variety of solutions taking into account the smells and disarray that, existing in the kitchen, should not interfere with common areas, taking into account the existence of guests, or the possibility of creating a separate space for meals, often accompanied with a careful exposure of possible social consequences of each solution. 3) Kitchens should ideally be not only located near the entrance - in order to facilitate the transportation of groceries - but also enable visual communication with the exterior of the apartment so that women may talk to neighbours, look after their children and take advantage of urban movement.

### 4.1.3. FREE TIME, A NEW MEANING OF HOME AND CHILDREN

A concern with how the increase of time spent at home verified at the time had implications in the collective life of the family and the relationship developed between children and parents was a concern of both Portas and Pereira and Gago. Growing consumption of mass media was considered likely to reflect on a more substantial amount of leisure time spent at home instead of outside, visiting neighbours or local commerce and services: "(…) the development of collective equipment in the neighbourhood or city does not seem to prevent, despite its importance and attractiveness, a tendency for this increase of free time at home."[23] (Portas 1969, p.47) However, while it appeared that neighbourhood relations were declining, it was also suggested that family life was becoming more collective. Simultaneously, there was also an increase in extra-spatial solidarities. The house was becoming the locus of social life not only in the relationships established between household members but also as a place for social gatherings with friends. Portas (1969) argued that with this came the need for creating a greater separation from the exterior of the house, related to the transition of social life to more elective relationships that may have the house as its locus. Confirming the growing desire for privacy, families systematically showed to prefer houses with a clear interface between exterior and interior (Portas 1969, Pereira & Gago, 1984).

A reduction in birth rate altered the relations parents established with their children. There was now a more significant focus on education at home, and a generally closer relationship between the two groups as parents wanted to spend more time with their children at home. This was accompanied with an increase in privacy requirements between children (in particular teenagers) and parents, which resulted both in the spatial separation of social activities like hosting, children's play, teenagers' activities and adults' work - increasing area requirements - and in the search of spaces that might be used to bring different groups together. Portas, in particular, expressed a particular concern with how the form of the house might have an impact on children's development:

**23** "(…) o desenvolvimento de equipamentos colectivos à escala do bairro ou da cidade não parece impedir, apesar da sua importância e atractivo, a tendência para este aumento do tempo livre no lar." Translated from Portuguese to English by the author of this dissertation.

> According to its spaciousness and organisation, the house might be, for a child, an open world or, contrarily, closed and full of interdictions. The lack of space prevents them from expanding, puts them at the mercy of adults humour, provoked by tiredness or stress, which translate in excesses of affection or severity.[24] (Portas 1969, p.54)

How the relationship of parents with their children was associated with the space of the house was a particular concern of Portas, who believed it might have broader social implications: "A decrease in youth delinquency symptomatically follows places were these concerns are felt, particularly when housing was thought to educate them."[25] (Portas 1969, p.27)

In Pereira and Gago, this was reflected in the categorisation of families according to their values: traditional, modern or in transition. Amongst the variables for this categorisation was whether or not women worked outside the house, but also how much independence was given to children, the role assumed by parents in their education, the time and characteristics of the time spent together at home.

If the concern for the woman's role in the family was reflected in particular focus on the space of the kitchen and its articulation with the rest of the house, the question of the family as a collectivity resulted in the specific study of the living room as one of the spaces of the house "most vulnerable to the evolution of habits, to the family's social mobility and to the contradictory requirements observed in its phases of transition."[26] (Portas 1969, p.47) The living room was the space which hosted both intra-familiar communication and its relation to the exterior world, and one which importance in the house seemed to be connected to social mobility, the increase in free time and in resources to invest in the home (Portas 1969).

Therefore, these studies registered several different approaches to the living room and made suggestions focused on the flexibility and polyvalence of social spaces that should be capable of accomodating all steps of the family's transformation. Instead of focusing on minimal areas, Portas argued that when it came to spatial organisation, planning for future requirements often

**24** "Ora conforme o seu desafogo e concepção a casa pode ser para a criança um mundo aberto ou, ao contrário, fechado e cheio de interdições. A falta de sítio impede-a de se expandir, põe-na mais à mercê dos humores dos adultos provocados por fadiga ou enervamento, que se traduzem em excessos de ternura ou de severdade." Translated from Portuguese to English by the author of this dissertation.

**25** "A redução da delinquência juvenil acompanha sintomaticamente os meios onde se respiram estas preocupações, sobretudo se o habitat foi pensado para as educar."Translated from Portuguese to English by the author of this dissertation.

**26** "(...) das mais vulneraveis à evolução dos costumes, à mobilidade social das familias e às exigencias contraditorias que se observam nas suas fases de transição." Translated from Portuguese to English by the author of this dissertation.

proved counterproductive. For example, even though he showed a preference for an open articulation of social spaces and was against, in particular, the creation of independent dining rooms - which would have consequences in the area of the house, and often put women in a more clear position of serving the family - he pointed out that "the solution was defended in experimental projects when some surveys verified that families wanted a sheltered and tidy room for their "dining furniture" so much that they wouldn't hesitate to sacrify a bedroom, even when necessary, to transform it into a dining-room."[27] (Portas 1969, p.51)

### 4.1.4. DOMESTICATION AND THE NECESSITY OF COMMUNITY

While, as we have just seen, the evolution of the family seemed to be in the direction of the prevalence of extra-spatial relations, both Portas and Pereira and Gago assigned significant importance to the promotion of neighbourhood relations. This is clear in Pereira and Gago (1986, p.28):

> (…) it is suggested as a fundamental cause of individual isolation, of lack of satisfaction in relations (…) of mental disorders and of the violence which characterises highly industrialised societies, the loss of intimate social relations with a sufficient number of people. This loss can only be repaired by the reconstitution of primary groups (familiar or others) that are sufficiently broad. As physical proximity is considered a base condition for the existence of a primary group, the entire housing-neighbourhood programme is put into question: how do we develop and organize housing, which primary groups of cohabitation will be formed, which cohabitation rules will they adopt?[28]

And in Portas (1959/2004, p.20):

> The defence of the private world - the creation of a humane space of retreat and serenity against the exhaustion of public life - cannot be, however, confused by or turned into individualism. An isolated home, enclosed, is not the one that most zealously preserves

**27** "A solução foi no entanto defendida em projectos experimentais quando se verificou nalguns inqueritos que as familias desejavam de tal modo um compartimento resguardado e arrumado para a sua "mobilia de jantar" que não hesitavam em sacrificar um quarto de dormir, ainda que necessário, para o transofrmar em sala fechado." Translated from Portuguese to English by the author of this dissertation.

**28** "(…) aponta-se como causa fundamental dos problemas de isolamento dos indivíduos, da insatisfação nas relações (…) dos distúrbios mentais e da violência que caracteriza as sociedades altamente industrializadas, a perda de convívio íntimo com um número suficiente de pessoas. Essa perda só é reparável com a reconstituição de grupos primários (familiares ou outros) suficientemente amplos. Como considera condição base para a existência de um grupo primário a proximidade física dos seus membros, é todo o programa habitação-vizinhança que se põe em causa: como realizar e agrupar a habitação, qual ou quais os grupos primários de coabitação que se irão formar, que regras de coabitação adoptarão eles?"Translated from Portuguese to English by the author of this dissertation.

> the virtuality of the institution [of the family] - but what caused it to degrade.[29]

Portas, in particular, related the loss of neighbourhood relationships - in spite of other extra-spatial relations - to greater domestication and individualisation of the family, which would be reflected in more traditional values:

> It happens sometimes, unfortunately, that the unilateral defence of the values of family isolation, against solutions which intensify the 'probability' of social life, even though the problem is faced in these two terms, presents itself more as an alibi of a certain social through which aims at atomizing and assigning bourgeois values to popular social classes, as a technique of neutralisation of their capacity for solidarity and defence.[30] (1959/2004, p.109)

To which he counters:

> It is established here one of the principles of personalism: that of the existence of a dialectic, a balance that is always to be finished, between the need of the 'other' in the development of individual personality (man personalises himself as he participates in community life) and the need to return to oneself, of one's own breathing and interior growth, and a condition of authenticity in this encounter with the 'other'.[31] (Portas 1959/2004, p.20)

For Portas, a successful family, engaged in community life, is a family who is simultaneously in charge of its own space, with the required privacy for the individual growth of each of its members, and a family which has its extra-familiar social life promoted by the environment in which it lives.

In this sense, Portas relates three stages of the social life of families with types of housing. The

**29** "A defesa do mundo privado - criação de um espaço humano de recolhimento e serenidade diante do esgotamento da actual vida pública - não pode ser, no entanto, confundida ou tornada em individualismo. Um lar isolado, fechado, não é o que aguarda com mais zêlo esta virtualidade da instituição - mas o que a degradou." Translated by the author.

**30** "Sucede às vezes, infelizmente, que a defesa unilateral dos valores de isolamento da família, contra as soluções que intensificam as "chances" da vida de relação, embora encarem o problema nos seus dois termos, se apresenta mais como um alibi de certo pensamento social que procura atomizar e emburguesar as classes sociais populares, como técnica de neutralização das suas capacidades de solidariedade e defesa." Translated from Portuguese to English by the author of this dissertation..

**31** "Radica aqui um dos princípios ao personalismo: o da existência de uma dialéctica, um equilibrio sempre por acabar, entre a necessidade do "outro" para o desenvolvimento da personalidade individual (o homem personaliza-se na medida em que participa na via comunitária) e a necessidade do regresso a si, da própria respiração e crescimento interior, como condição de autenticidade nesse encontro do "outro"." Translated from Portuguese to English by the author of this dissertation.

first, made up of direct relations of encounter and cooperation, needs a housing group articulated with social equipment, as

> an inorganic and individualist urbanism cannot centre these potentialities in the estate: the absence of spaces of common interest and of associations for their management, of spaces of reunion and entertainment of a familiar character, will serve the maintenance of the separation of family members by gender or age, and as such, the club and bar for men and the house for women.[32] (Portas 1956, p.33)

The second, consisting of organized families that are capable of reclaiming and solving their own problems, requires a spatial connection between an associative structure and social life: families that take care of the maintenance of order and cleanness in the neighbourhood, manage collective equipment, and establish relationships between inhabitants which are useful for the community. The third includes the family in local politics through its organisation in organisms which have the residential community as its basis.

In this same line, Pereira and Gago put the focus on the distance between the house and the other activities of the family. When large, this distance would cause dispersion of family members and a reduction of activities performed together at home - both due to other interests and to the decrease of free time in favour of longer commutes - creating more independence but also distance within the family. In the estate, this would result in less frequently used exterior and collective spaces, turning the neighbourhood into a dormitory often void of movement and sometimes with a threatening appearance, and weakening neighbourhood relationships. However, with no empirical basis on which to found possible solutions, Pereira and Gago (1984) did not approach the question of neighbourhood relationships and mutual-aid systems further at this time.

This idea of domestication as defined by both what happens at home and what happens outside of it demanded a transformation that transcended the scope of architecture and urbanism, and put further pressure in a long-felt contradiction by progressive technicians between a willingness to create socially useful housing programmes and accepting the logic of urban land speculation, which resulted in the "inhumanity of imposing brutal cost reductions to a housing programme that impact areas, equipment, finishings or result in the amputation of collective equipment."[33]

**32** "Mas um urbanismo inorgânico e individualista não permite centrar no bairro estas virtualidades: a ausência de lugares de interesse comum e associações para a sua gestão, de reuniões e divertimentos de carácter familiar, manterá a divisão dos membros por sexos ou idades e, com ela, o clube e o café-para-homens e a casa para as mulheres" Translated from Portuguese to English by the author of this dissertation.

**33** "Desumanidade de acabar por se impor a um programa habitacoal rduções brtais de custo, incidindo nas áreas habitaveis, no equipamento e acabamento do fogo, ou na amputação do equipamento colectivo." Translated from Portuguese to English by the author of this dissertation.

(Portas 1956, p.55) As an alternative, Portas (1956, p.56) proposed:

> […] to build houses, but houses […] that nurture instead of strangulating; the need to create collective equipment that is so far an exclusive of the privileged classes (ex: kindergartens), that implies, first of all, a legislative apparatus and a specialized organization that we lack. But that also requires the qualitative management of urbanism and housing: a division of the localization criteria of jobs, entertainment and housing, today almost always […] disintegrator elements of family reunion […][34]

## 4.2. LEARNING FROM THE SURVEY ON URBAN HOUSING

### 4.2.1. DESCRIPTION OF THE SURVEY

The Survey to Urban Housing (Pereira and Gago, 1984) was the final report of a long-running research project whose main goal was that of providing a better understanding of family dynamics and ways of life at home, while also articulating with the field of research which was starting to explore how these were affected by architectural action. Using contemporary sociological studies as a point of departure, the research project combined the development of theoretical thought with empirical data on how families lived and used the domestic environment gathered through the realization of questionnaires. The principles and concerns transversal to the period that were summarised in the previous chapter of this dissertation were expressed in the three main objectives of the research:

1. To gain knowledge on societal evolution both in its global trends and particular aspects which affect housing, in the sense of defining a theory of housing which should consider the totality of everyday life with the house as its basis, and which should define the meaning of habitat through the understanding of how people live in the spaces they inhabit.

2. To gather and select data on how families use the space of the house that might be useful in the definition of housing programmes, and whose explanatory character might enlighten

**34** "[...] construir fogos, mas fogos que [...] estimulem em vez de estrangular; necessidade de levar por diante a dotação de equipamento colectivo agora ainda exclusivo das classes privilegiadas (ex: os jardins de infancia), o que implica, antes de mais, um instrumento legislativo e uma organização especializada que nos falta. Mas atinge também o tratamento qualitativo do urbanismo e da habitação: exige uma divisão dos critérios de localização dos centros de trabalho, recreio e habitat, que são agora quase sempre [...] elementos desintegradores da reunião familiar [...]" Translated from Portuguese to English by the author of this dissertation.

architects about the meaning of the spaces they create.

3. To determine "values-spaces" that express both requirements and images of housing, utility and poetics. Housing should be a reflection of these through the active search for their knowledge and through a flexibilization of forms:

> The hierarchic values of housing are not necessarily expressible in space, there might not be direct correspondence, but the built environment must allow, and if possible favour, their expression. We search to know the formal language and the physical values that without conditioning, give the user freedom of expression and possibilities of appropriation.[35] (Pereira & Gago, 1984)

| SPATIAL CRITERIA FOR SAMPLING | | | | | |
|---|---|---|---|---|---|
| relationship between the house and it's immediate surroundings | privacy and socialisation | privacy | design solutions with and without living or bedrooms open to public or semi-public spaces | single family housing | living room on ground floor, entrance side<br>bedroom on ground floor, entrance side<br>no living room or bedroom on ground floor, entrance side |
| | | | | central or side corridor | living room over corridor<br>bedroom over corridor<br>no living room or bedroom on entrance side |
| | | | | central access | living room on entrance side<br>bedroom on entrance side<br>no living room or bedroom on entrance side |
| | | socialization between neighbours | design solutions with different types of house distribution | aggregation scheme with up to 4 houses | narrow access hall |
| | | | | aggregation scheme with more than 4 houses | single family houses<br>corridor<br>large access hall |

Table 4.1
Spatial criteria for sampling used in the research conducive to the Survey to Urban Housing (Pereira & Gago, 1984)

**35** "Os valores hierarquizados próprios do habitar não são necessáriamente exprimíveis em espaço, pode não existir uma correspondencia directa, mas o espaço construído terá de permitir, e se possível favorecer, a sua expressão. Procura-se entao conhecer a linguagem formal e os valores fisicos que sem condicionar, deixam ao utilizados liberdade de expressão e possibilidades de apropriação." Translated from Portuguese to English by the author of this dissertation.

| SPATIAL CRITERIA FOR SAMPLING | | | | |
|---|---|---|---|---|
| living room-kitchen sector | relationship between area and use | dimension | kitchen | small <6m² (cannot accomodate meals)<br>6m²<medium<8m² (can accomodate meals)<br>large >8m² (permite refeições, lavagem de roupa, etc) |
| | | | living room | <16m2<br>> 16,2m²<br>< 20m² |
| | | | living room-kitchen sector | > 26m² < 30m²<br>> 30m² |
| | flexibility of design solutions for sets of activities | formal solution | single living and dining room<br>living and dining room in two permeable spaces<br>additional small living room<br>additional small room for domestic tasks | |
| | problems coming from the type of permeability between the kichen and the living-dining room | independence kicthen-living room | non-separable kitchen and living-dining room<br>separable kitchen and lliving-dining room<br>independent kichten and living-dining room | |
| | | living-dining room privacy (or lack of) | no crossing<br>crossing for kitchen service only<br>different circulations | |
| | | house dimension | T1 (18%)<br>T2 (6%)<br>T3 (35%)<br>T4 (19%)<br>T5 (15%)<br>T6 (7%) | |

The objective of the research project was then not only to gain knowledge on how families used the space of the house but also to use this knowledge to understand the values attributed to the house in everyday life and inform a future architectural decision process that was equipped to reflect them adequately. These values and societal concerns were focused on three main aspects regarding the transforming family and home of the 1960s and 1970s, which had mainly to do with a) a search for design solutions that might reflect a shift in the understanding of the woman's role in the household; b) how housing development might take into a growing intensification of the time spent at home and simultaneously; c) how design might counter the consequent decline of neighbourhood relations.

The Survey searched to answer these questions through a series of interpretative and quantitative questionnaires that were conducted on 300 families living in four areas within the municipality of Lisbon (figure 4.1.) and distributed across 50 different apartment schemes. These areas were

selected because architectural drawings were easily accessible, while simultaneously representing a wide range of families of different socioeconomic classes, apartment layouts and urban morphology, integration in the city and rent layouts. Based on the formulation of the social and spatial hypothesis explored in section 4.1., criteria for sampling based on spatial attributes were established (table 4.1.), to which these housing developments mostly corresponded.

Benfica (B), is an area in the west of Lisbon composed by single-family houses. It was developed in the late 1940s in what was at the time a mostly unurbanised area of the city, disconnected from secondary urban centres, as well as local infrastructures and services. Alvalade (A) was one of the first experiences of large scale collective housing in the country. It was developed around 1950 in a central area of Lisbon in the scope of an affordable housing programme conducted by social security institutions which, working with some of the better-known architects in the country, became known by the architectural quality of its enterprises. Olivais Norte (ON) and Olivais Sul (OS) are two large, adjacent, social housing estates built in the 1960s in the scope of the same programme. They are made up of large housing blocks and wide-open spaces and, located in the north of Lisbon, away from secondary urban centres, they have few and concentrated local services and infrastructures.


Figure 4.1.
Map of Lisbon with localization of the four neighbourhoods. Google Earth, 2019.

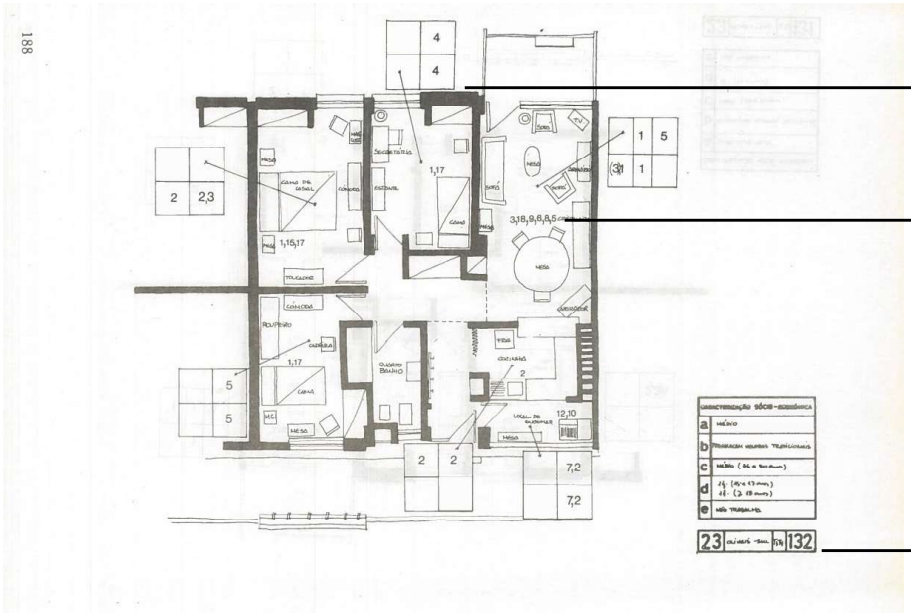
The selected families were categorised by their social, economic and professional status, and according to the dominant type of social values demonstrated. The first categories depended solely on the condition of the "head of the house" - the husband, father to the children in a traditional family, and the woman when single or widowed - and took into account level of instruction, profession, position in his career, monthly income and income per capita. These variables were then aggregated to define the family's socioeconomic level. The second category divided families into those with traditional values, those transitioning from traditional values to modern values, and finally, modern families. This classification took into account the criteria shown in table 4.2.:

the role of the woman, both in the house and outside of it, the role of the "head of the house" at home, their attitude towards sexual life, their aspirations regarding their children's professional success, the type of authority exerted over children and both the type of relationships established within the family and its openness to the outside world. Additionally, families were characterised according to the ages of the couple, the number and ages of children.

| | | |
|---|---|---|
| **ATTITUDE TOWARDS WOMEN** | women | occupation |
| | | reasons why she works, or not, outside the house |
| | | individualization, or not, of domestic tasks |
| | men | responsability for household income - occupation |
| | | participation in domestic activities |
| | couple | attitude towards sexual life |
| **ATTITUDE TOWARDS CHILDREN** | aspirations regarding children's professional success | differences between genders |
| | | distinction, or not, of aspirations according to gender |
| | parents' authority over their children | freedom in the personnal organization of bedrooms |
| | | appreciation of the education children have in school |
| | | necessary condition to leave children unwatched |
| **FAMILY LIFE** | | frequency and type of conviviality between family members |
| **AWARENESS OF THE EXTERIOR WORLD** | | type and regularity of reading |

Table 4.2.
Variables for the definition of the families' socioeconomic level.

The process of inquiry included pre-defined questionnaires with room for different answers than those proposed. The results were presented in a collection of apartment plans, each representing one of the 300 families. The interior space was divided into rooms labelled according to a general function, such as kitchen, living room and bedrooms. For each family, the arrangement and disposition of furniture were registered. In each labelled room, it was represented which domestic activities took place, and which family members were usually present at the different times of day (defined as morning, lunch time, afternoon, evening and night), as seen in figure 4.2..



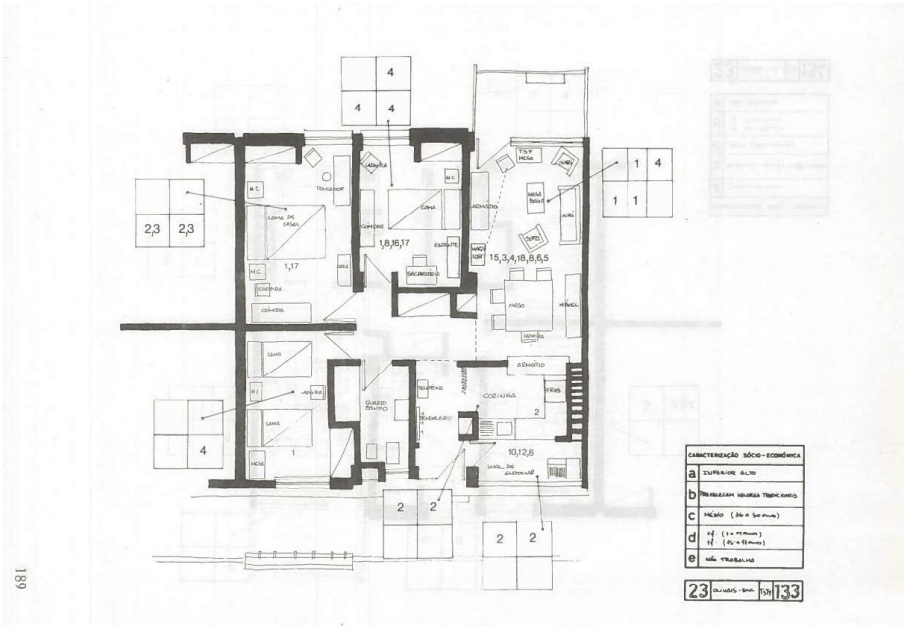




Figure 4.2.
Survey data for two families in the same apartment scheme.
*Luz Valente Pereira and Maria Amélia Gago, Survey on Urban Housing, 1984, p.188-189*

Additionally, each family was characterised according to socioeconomic variables, such as income level, traditional or progressive values, parents age, children's age and the employment status of the woman, as defined in table 4.3:

| FAMILY MEMBERS | TIME SLOTS | LABELLED SPACES |
|---|---|---|
| woman | morning | bedroom |
| man | lunch time | kitchen |
| children (female) | afternoon | livingroom |
| children (male) | evening | diningroom |
| other relative | dinner time | exterior space |
| housekeeper | night | other space |
| all members | | |

Table 4.3.
Labels contained in each plan in the Survey on Urban Housing

The plans published in the Survey's reports provide information on where domestic activities take place, and where and when household members are usually located in the house. Domestic activities are defined in the Survey according to previous research (Portas 1969) on essential domestic functions. These were considered to be: *sleeping, prepare meals, regular meals, weekend meals, special meals, general permanence, adult guests, children's play, studying, professional activity, young guests, ironing, washing clothes, drying clothes, sewing, particular permanence, adults studying.*

The questionnaires included a variety of questions whose information is not fully available in the reports. For example, data on for how long the inquired families had resided in Lisbon and where they resided before, or on how satisfied they are with their houses and what they would change about it, are available only as aggregated information on the globality of the sample, and not regarding each specific family. Similarly, data regarding which members of the household performed which tasks and when were gathered during the questionnaire process, but not published alongside the plan-household sets. Similarly, the research process that lead to the decisions made regarding the definition of social attributes of families are not described or supported - empirically or theoretically - in the document.

This Survey was designed to shed light on some questions regarding the transformation of society, the ways of life of families and the use of the domestic space. So that the research was practicable with the existing resources, the sample used was defined in order to "present a series of characteristics that allowed for the analysis of the proposed problem, and it was not attempted to make it representative of any determined population"[36] (Pereira and Gago, 1984, p.11).

36 "A amostra a utilizar deveria portanto apresentar um conjunto de caracteristicas que propiciasse a análise do

The selected cases are not distributed evenly throughout the different areas, nor dimensioned in order to be representative of them. Representing 6% of the universe of the four chosen areas, the results of the Survey are not representative of that population. Less so are they representative of the population of Lisbon, and even less so of that of the whole country, reaching up to Porto. Due to the limited amount of data gathered and the variety of apartment schemes included in the study, any conclusions regarding different forms of use for different apartment schemes are limited. If the families were equally distributed across apartment layouts, each layout would have information on its use by only six families. Because families are not equally distributed across layouts, some gather even fewer data.

Additionally, as we have just seen, some of the information collected throughout the study was not made fully available. As such, the analysis and subsequent interpretation took into account three critical limitations of the dataset:

1. It is not clear what the identification of family members in spaces in time-slots means regarding the regularity of that occurrence. It is not possible to know if the convergence of family members in the same labelled spaces and in the same time-slots is an indicator of co-presence.

2. It is also not explicit whether the "all" category is a representation of all family members at the same time or a substitute for signalling all individual family members.

3. An essential amount of social data regarding each family, as well as most non-spatial information from the inquiries – notably who performs which activities - was never fully published. As a consequence, it is possible that potentially interesting interpretations are being missed, or can only be advanced as hypotheses.

Therefore, the inquiry was considered to be an interesting source of empirical information both on the relationship between domestic activities and the space of the house, and on family life in urban areas in the 1970s that would be otherwise unavailable. However, it was sought that the approach to its analysis focused on general rather than minute aspects of these so that it would be possible, in articulation with the theoretical framework, other studies, and the information available on the case study, to add - without too much guesswork - to the understanding of housing in Porto between 1969 and 1982, not only in how it was designed but also in how it might have provided a basis for family life.

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problema proposto e não se procurou torná-la representativa de um qualquer conjunto determinado de população." Translated from Portuguese to English by the author of this dissertation.

## 4.2.2. METHODOLOGY

The steps taken for the analysis of the Survey on Urban Housing that had as its primary objective informing the posterior analysis of apartment layouts developed in Porto in between 1969 and 1982 are illustrated in figure 4.3. (see next page), and described throughout the following points.

**1. Definition of a preliminary analytical framework**

The analysis conducted on the Survey was based on the set of concerns put forth by researchers at the time, as well as on the hypotheses they identified regarding both how social transformations may have an impact on family life, and how these may be encouraged or hindered by the organisation of the space of the house. These ideas were then articulated within the theoretical and methodological framework presented so far. It is part of the theoretical premise developed in chapter 2 that one central role of architecture is that of organising socially defined actvities in space. In this context, the Survey on Urban Housing was an empirical step towards an understanding of how and to what extent patterns of domestic activities and interaction may be organised, encouraged or hindered by the spatial characteristics of the domestic environment.

In this sense, two of the four main social and familiar transformations identified in the studied documents where chosen to be further examined, due to being related to relations established inside the house: a) how the emancipation of women reflected or not in the domestic environment and b) how an expected increase of time spent at home impacted the relations established between family members. An initial, pre-spatial analysis looked at how these translated in patterns of human activity in the house or, more specifically, how these could be observed in the distribution of family members and activities in the space of the house during different times of the day. The subsequent spatial analysis took into account the hypotheses posed in the examined documents in regards to which spatial mechanisms may encourage these transformations, as well as space syntax theory and methodology.

An understanding of women's role in the family was limited to the observation of whether patterns of co-presence between women and other family members existed or not, whether traditionally feminine domestic activities were performed in spaces where social activities also took place, and, additionally, whether these patterns changed in the few cases where women held full-time jobs. It implied a closer examination of the space of the kitchen, its area and syntactic attributes, as well as its relation to other spaces of the house. If these spatial attributes were shown to have some relation to women's integration at home, then they might be said to provide spaces with an emancipator potential.

How an increased time spent at home impacted family relations was examined in regards to two opposing, but not excluding, types of relations. It was observed whether or not family

Figure 4.3.
Preliminary steps for analysis

members seemed to spend time in the same rooms during the same time-slots, whether there was a strong or weak preponderance of activities with active or passive social potential, but also whether there were spaces where only one family member was registered at a time, or where individual activities were predominant. This implied a closer examination of the living room and bedrooms, their area and syntactic attributes, as well as their relation to other spaces of the house, number of rooms, non-labelled spaces and the overall area of the house. If these spatial attributes were shown to have some relation to patterns of co-presence between family members and social activities, then they might be said to provide spaces with social potential. Contrarily, if these spatial attributes could be shown to allow for privacy between family members for the realisation of certain individual activities, then they might be said to provide spaces with potential for individual development.

This preliminary framework for analysis is synthesised in figure 4.3.

How activities were classified according to types is synthesised in the following table 4.5.:

| | |
|---|---|
| private needs | 1) sleeping |
| extended chores | 9) professional activity |
| | 19) adults studying |
| passive leisure | 8) studying |
| | 17) particular permanence |
| interactive/collective leisure | 7) children's play |
| | 5) general permanence |
| | 16) young guests |
| | 6) adult guests |
| communal needs | 3) regular meals |
| | 18) weekend meals |
| | 19) special meals |
| household chores | 10) ironing |
| | 15) sewing |
| | 12) drying clothes |
| | 12) washing clothes |
| | 2) preparing meals |

Table 4.5.
Classification of activities according to types

**2. Data extraction from plans**

The apartment plans published in the Survey's report were first redrawn in CAD, and their corresponding accessibility graphs were then modelled in Rhinoceros. Utilising Grasshopper's plugin Syntactic, developed by Pirouz Nourian and Samaneh Rezvani at TU Delft, the syntactic measures of integration, difference factor, control, links-nodes ratio, total depth, mean depth and depth between each space to all other spaces were extracted from the graph. Additionally, Grasshopper was used to extract the total area of apartments and the total and relative area of spaces, the depth of each space from the exterior of the apartment, and the type and functional type of spaces. Data regarding the way different families used the house - which activities were performed in each space of the house, which family members registered in each space of the house in each time-slot - were encoded into the CAD drawings and extracted with resource to Processing[37] so that they could be associated to the corresponding housing layouts and spaces.

Accessibility graphs were constructed at the height of 1.50m, not taking into account non-functional spaces, such as closets, and divided according to labelled spaces, regardless of their shape. As seen in chapter 3, It is argued that this type of partitioning relates more clearly with the way the space of the house is understood by its inhabitants (Amorim 1999, Monteiro 1997, Bafna 2013). Additionally, this type of partitioning is necessary for grouping of spaces according to the type of activity that is likely to take place inside them. Griz & Amorim (2015,p.6, p.5) argue that "the most efficient way to analyse the relationship between the domestic space organisation and its social meanings (…) is by observing the emerging spatial patterns of inequality genotypes (…) related to a set of domestic activities", both by looking at them through the convex spaces that house these activities and through the three main domestic sectors: social, private and service. Similarly, Bafna (2001) defends that clusters add a new layer of meaning to nodes in the hierarchically organised graph, depending on which cluster it belongs to, and what structural role it plays within it, and that it is the structure of clusters that represent the essential genotype.

**3. Data encoding and organisation**

This process produced three datasets. One is made up of categorical variables, containing the identifying labels of the apartment schemes and spaces to be analysed: a label for each neighbourhood, an ID for each apartment scheme, and a label for each type of space. Other gathers data regarding spatial attributes, and contains numerical data, both continuous and discrete. Finally, the third dataset contains categorical data encoded as nominal dichotomy variable types, describing what activities are performed in which spaces of the house, and what household members are registered in which spaces at which times. The latter also adds an extra level of analysis. While the

**37** Code developed by Petros Koutsolampros, PhD researcher at the Bartlett School of Architecture in 2018.

in the first and second datasets, each variable had only one value for each labelled space, the third dataset provides a variety of different values, according to how many households share the same apartment scheme.

Spatial and social data were encoded following a combinatory strategy. All variables were included in one same dataset where each row corresponds to one labelled space that belongs to one household. The redundancies created through this process - as spaces organised in similar apartment schemes and so sharing the same spatial attributes are repeated as they are attributed to different households - had to be taken into account during the analysis. In order to explore the main questions of this research, spatial variables were considered the independent variables, and variables regarding house use were considered dependent variables.

**4. Description of the gathered data and visualisation**

While the aim of that study was explicitly to relate spatial attributes with the way domestic activities are carried in the apartment, this was not fully achieved at the time. Most conclusions pertain to the modes of aggregation of different activities, with some, not thoroughly systematised, information on the relationship between different activities and the area of kitchens. The analysis published in the book is informative of the way of life of the sampled families, providing some sociological results of the inquiries that cannot be learned by studying the plans. The knowledge provided by this information was incorporated in the exploratory analysis conducted on the gathered data.

The data were organised, described and subjected to a preliminary analysis through exploratory data visualisation. In the first moment, the data was explored through its description, in order to provide an understanding of the information present in the dataset. Here, particular attention was given to social variables such as social class, type of family or age of parents, in order to search for significant differences in the type of spaces corresponding to different values that might invalidate using spatial attributes as the independent variables. In a second moment, the data were explored through a variety of graphs and tables in order to visually detect possible patterns of the types of activities (individual, services and collective) that more often take place in different types of labelled spaces, the amount of time spent in the house and type of room by each family member, the most common spatial attributes of each type of activity and, finally, some spatial attributes relating to different types of use of the domestic space.

The preliminary findings from these two steps are organised and presented throughout the following sub-chapters as follows:

1. First, a statistical description of the dataset is provided.

2. Then, the integration values of different activities are explored in order to detect

patterns that can be compared to those of previous syntactic studies.

3. Finally, for each of the three defined aspects of family dynamics to be explored in space (i) the patterns of collective use of the house, ii) the organisation of women's life at home and iii) the private appropriation of spaces), data will be explored around three points:

a) Ways of life and family dynamics,

b) General patterns of room use by household members,

c) potential differences in patterns or room use according to spatial attributes.

## 4.2.3. ANALYSIS

### 4.2.3.1. Description of the dataset

The dataset resulting from the process of digitation, data extraction and combination described in 4.2.2. contains information on 60 apartment schemes and 281 households, disposed throughout 1651 rows. It examines a total of 5 categorical independent variables for labelling spaces; 9 nominal polytomy independent variables regarding the socioeconomic character of households; 10 continuous independent variables regarding spatial attributes; 4 discrete independent variables of spatial depth; 3 independent dichotomy variables regarding space categories; 17 dependent nominal dichotomy variables regarding types of activities; and 42 dependent nominal dichotomy variables regarding household members in time-slots.

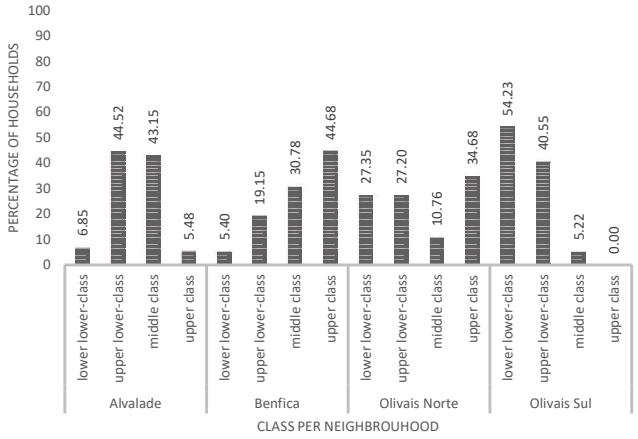
| | |
|---|---|
| **LABELS** | neighbourhood, household, typology, type of room, ID of room |
| **SOCIOECONOMIC ATTRIBUTES** | social class, family values, age of couple, children 3-6yo, children 7-14yo, children 15-17yo, children 18+, professional status of woman |
| **SYNTACTIC MEASURES AND AREA** | integration, control, difference factor, links-nodes, mean depth, total useful area, area, relative area, integration of transition spaces |
| **SPATIAL DEPTH** | depth to exterior, depth to livingroom, depth to kitchen, total depth |
| **SPACE CATEGORIES** | space-type, functional space-type, centrality type |
| **TYPE OF ACTIVITIES** | sleep, prepare meals, eat meals, eat special meals, eat weekend meals, general permanence, adult guests, child's play, studying, professional activity, clothes related, permancence in exterior, sewing, young guests, personal permanence, studying adults |
| **HOUSEHOLD MEMBERS IN TIME SLOTS** | all, woman, man, sons, daughters, relatives, employee, morning, lunch, afternoon, evening, dinner, night |

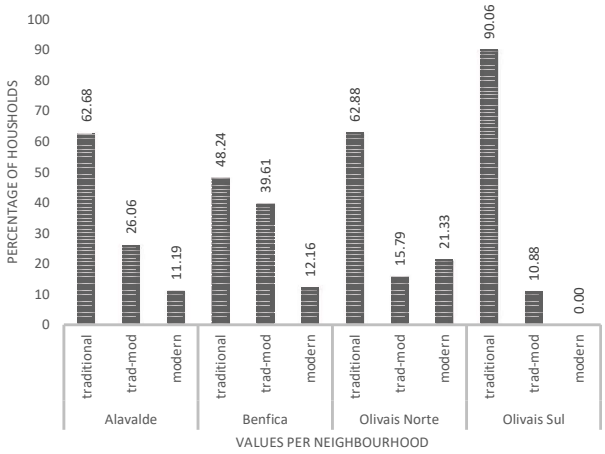
Table 4.6. Variables in the dataset constructed for the analysis of the Survey on Urban Housing Pereira & Gago, 1984

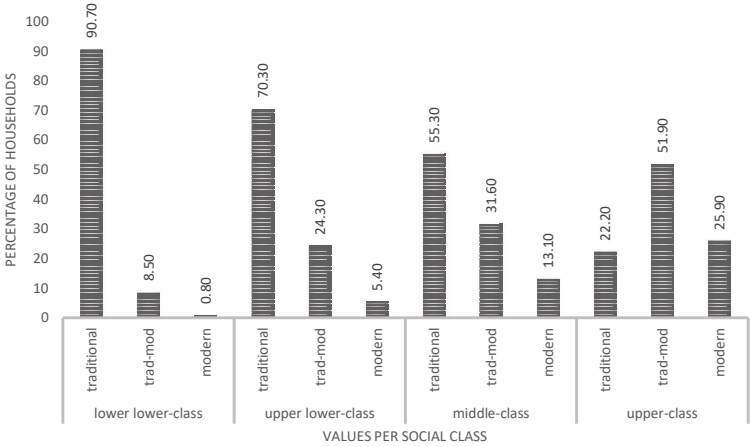
The published reports (Pereira and Gago, 1984) reported information on 300 families living in 50 apartment schemes, distributed across 4 different areas in Lisbon. However, during the process of plan redrawing in CAD, it was made evident that, due to slight differences in the plan - either the result of variations of the same type or of alterations done to the apartments by their residents - the survey presented 79, rather than 50, layouts with different configurations. Some of these included as little as 1 case of household-occupation, while others reached a maximum of 9 cases of household-occupation. In this sense, a total of 19 cases where minor variations in the apartment layout resulted in configurational changes and which corresponded to only one case of household-occupation, were excluded from the analysis. However, the disparity of households per apartment scheme remained, as some apartment schemes are repeated in as little as 2 families and some in as many as 10. This raised the problem of finding appropriate ways of aggregating data other than apartment typologies, which was approached through exploratory analysis and visualisation of the data.

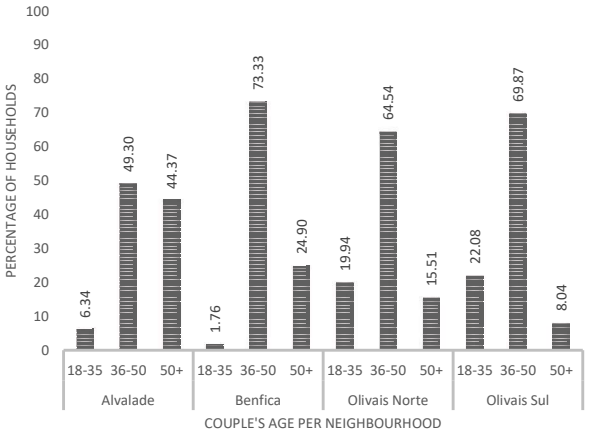
Similarly, the sample is unevenly distributed through the four neighbourhoods, both in the amount of inquired families and in their socioeconomic characterization. While 76% of the sampled families belong to the lower classes, figure 4.4. shows that these are heavily concentrated in Olivais Sul, which contains roughly ¾ of this class, and low numbers of middle and upper-class families. The latter are better represented in Benfica, which has a much more balanced sample. Family values (ranging from traditional to modern) also seem to vary across neighbourhoods. If it is clear that what werre considered traditional family values are dominant across the sample, Olivais Norte has a more significant percentage of families with more modern values. The majority of households in the sample consists of couples within the age range of 36 to 50 years old, but Olivais Norte and Olivais Sul have generally younger residents, and Alvalade and Benfica generally older residents. The vast majority of inquired women did not perform any professional activity. The proportions of working and non-working women across neighbourhoods are reasonably similar. If it is noteworthy that families in the lower classes have the largest percentage of non-working women, the strata of the population represented in these categories must also be taken into consideration. The surveys were conducted in the early 1970s and concerned families living in public housing. As will be explored further in chapter 7, public housing during the Portuguese dictatorship was most often not directed at the most impoverished of working class families but at families with stable, if low, income.

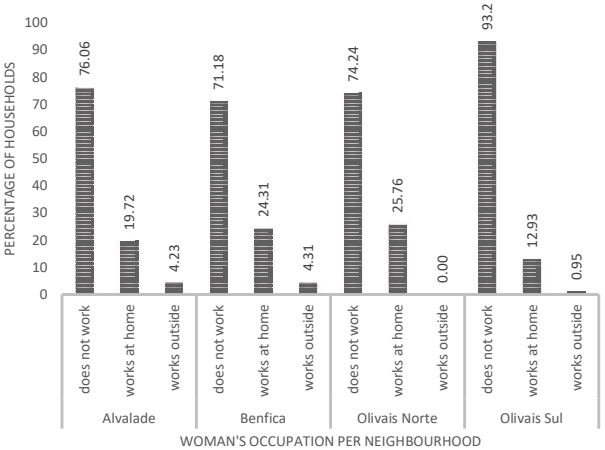
In light of these differences, it appeared important to check for variables that might be influenced by class and show similarities across the sample, or influenced by neighbourhood and break the sample is considerably different sets. Regarding socioeconomic characteristics, figure 4.5. shows that class differences translate in a growth of the total useful area of apartment layouts. In particular, layouts assigned to middle and upper-class households in Olivais Norte are larger than other cases. The average area of labelled rooms follows a similar growth pattern to that of total useful floor area, which seems to indicate that larger aparments are not simply composed by a larger number of spaces.



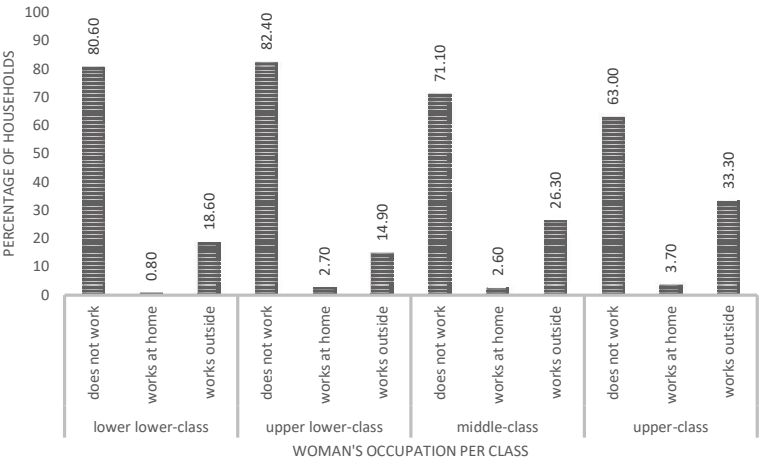




**Figure 4.4.**
Descriptive graphs: a) class per neighbourhood b) values per neighbourhood and per class, c) couples' age perneighbourhood, d) woman's occupation per neighbourhood and per class

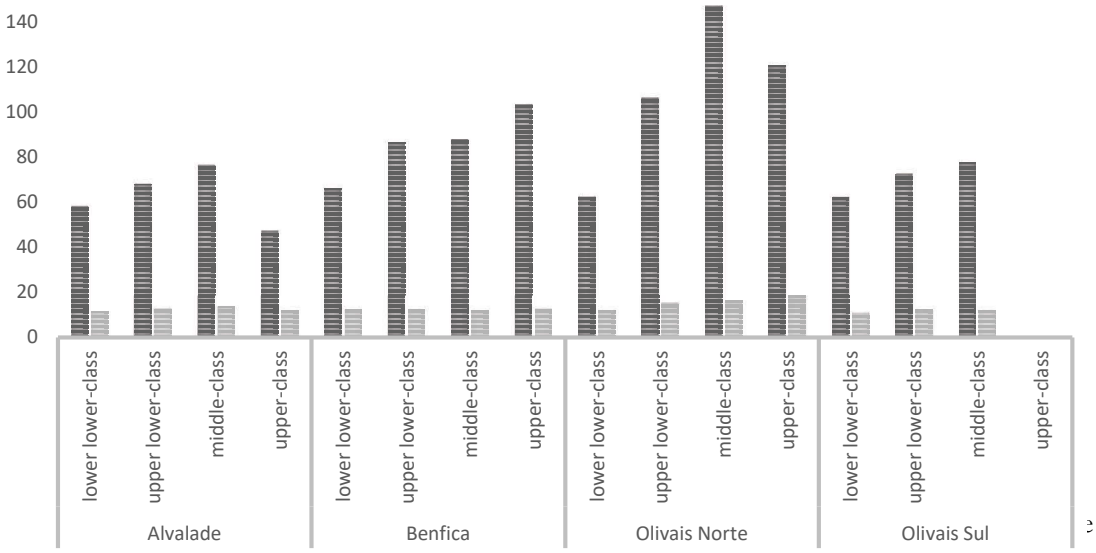



Figure 4.5.
Mean total useful floor area and average area of labelled rooms per class, per neighbourhood.

more significant. Benfica, where most of the layouts are for two-story apartments, has much lower average values of integration and larger values of total depth than any of the other neighbourhoods.

If there do not seem to exist stable patterns of spatial differences across class or neighbourhood, substantial variations in the means of integration, total useful floor area, control, depth and difference factor (table 4.7.) can be verified across the dataset and were taken into account during the analysis.

| | TUFA | INTEGRATION | CONTROL | TOTAL DEPTH | MEAN DEPTH | DIFFERENCE FACTOR |
|---|---|---|---|---|---|---|
| **mean** | 81.60 | 0.87 | 0.69 | 38.95 | 2.76 | 0.78 |
| **std** | 31.21 | 0.36 | 0.61 | 20.30 | 0.80 | 0.08 |
| **min** | 50 | 0.40 | 0.17 | 0.65 | 0.37 | 0.55 |
| **25%** | 59.4 | 0.65 | 0.25 | 22 | 2.18 | 0.72 |
| **50%** | 74.1 | 0.81 | 0.5 | 32 | 2.53 | 0.79 |
| **75%** | 97.3 | 0.95 | 0.83 | 56 | 3.45 | 0.87 |
| **max** | 176.5 | 2.65 | 3.67 | 105 | 5.26 | 1.24 |

Table 4.7.
Description of the dataset.

### 4.2.3.2. Patterns of integration of activities

When ordered by integration, activities show a pattern consistent with previous research conducted by Monteiro (1997), on the ordering of domestic activities by integration in Brazilian houses. In her study, Monteiro gathered space use data on 101 houses from 3 neighbourhoods in order to understand how different groups of activities reflected social and cultural concepts of spatial distribution within a dwelling. The neighbourhoods represented different spatial attributes

and social classes. The activities considered were defined based on a different set of studies, but a parallel can be drawn with those from the Survey to Urban Housing, as indicated in table 4.7. No correspondence exists for dating, washing the face, taking baths, making love, going for a stroll, drinking beer, shopping, doing special tasks. While playing with children was initially considered by Monteiro as an extended chore and watching tv as passive leisure, empirical data showed these were more often considered as interactive leisure.

| | Survey on Urban Housing | Monteiro (1997) |
|---|---|---|
| **private needs** | 1) sleeping | sleeping |
| **extended chores** | 9) professional activity | working |
| | 19) adults studying | |
| **passive leisure** | 8) studying | studying |
| | | reading |
| | 17) particular permanence | listening to music |
| | | watching tv |
| **interactive/collective leisure** | 7) children's play | playing with children |
| | 5) general permanence | chatting/watching tv |
| | 16) young guests | |
| **communal needs** | 6) adult guests | meeting with friends |
| | 3) regular meals | having lunch |
| | 18) weekend meals | dining |
| | 19) special meals | |
| **household chores** | 10) ironing | ironing |
| | 15) sewing | |
| | 12) drying clothes | washing clothes |
| | 12) washing clothes | |
| | 2) preparing meals | cooking/washing up |

Table 4.8. Correspondence with activities identified by Monteiro (1997)

While differences are to be expected for studies carried out with different methodologies and

on different demographics, the results of the two, as shown in figure 4.6. and figure 4.7., present consistent similarities.

As in Monteiro, meals are the activities which take place in rooms with the highest average levels of integration. They are followed by general permanence, which takes place in the same relatively integrated rooms as the activities in Monteiro's study that would be encompassed by this more general term, such as watching tv, chatting and listening to music. Sleeping appears at the end of both charts, around the 0.8 integration mark.

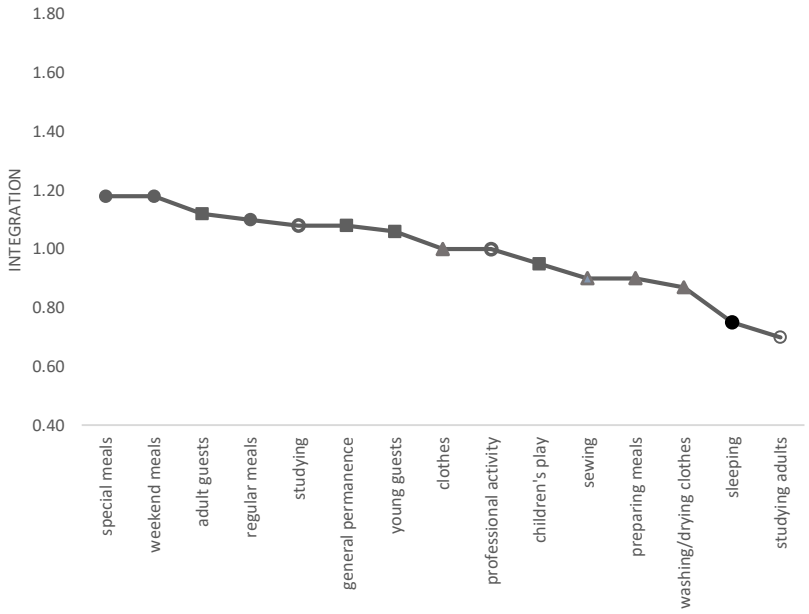



Figure 4.6. Activities ordered by mean integration values (Survey on Urban Housing)

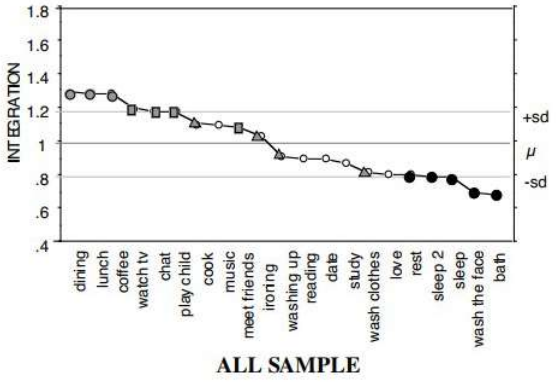



Figure 4.7. Activities ordered by mean integration values Circe Monteiro, Activity Analysis in Houses of Recife, Brazil, in Proceedings of the First Space Syntax Symposium, 1997, p.20.8, London

There is, however, a notable difference in the integration of cooking. Because cooking is a fixed activity, meaning it has to take place in a determined pre-equipped room, this seems to point more towards a difference between the Portuguese and Brazilian apartment layouts than it does to a question of choice of use. Another notable difference can be verified in the integration levels

of studying, which while one of the better-integrated activities in the Survey on Urban Housing, is at the lower end of Monteiro's integration chart. However, as Monteiro does not differentiate between studying and adults studying it is not possible to know the significance of this difference.

It is also worthy of note that while similarities between the Survey on Urban Housing data and Monteiro's research appear to be clear when the two samples are considered in their entirety, these do not hold up when the samples are divided according to socioeconomic class. While these correspond to different types of housing layouts in Monteiro, it has been shown in the previous chapter that no consistent spatial differences in lower, middle and upper-class apartments seem to exist in the Survey on Urban Housing apartment layouts. Without access to more detailed information than that provided by Monteiro (1997) regarding the socio-economic characteristics of the families in public housing, middle-class flats and middle-class housing, it is not possible to attempt an exact correspondence.

However, class differences do exist in the data that suggest that some of the variation in the way activities are distributed in apartments across samples may surpass spatial differences. An example of this is that while kitchens are not larger or more integrated in lower-class apartment schemes (cooking is one of the less integrated activities for this class), a larger variety of activities seem to be distributed between the living room and the kitchen (figure 4.9. on page 124). On the contrary, while kitchens are one of the most integrated labelled spaces in middle-class apartment layouts, these families seem to mostly use these spaces for those fixed activities that cannot take place anywhere else in the house. Instead, and similarly to upper-class families, activities with varying degrees of socialisation take place in less integrated living rooms and the bedrooms.

An ordering of average integration values may or may not translate into a consistent ordering of activities in each type of apartment. Table 4.9. suggests that a pattern exists for the activities of eating, sleeping and general and particular permanence. Sleeping shows consistently low values of integration, consistent with those verified for bedrooms, and tend to concentrate in the first quartile of integration in each apartment scheme. Meals and general permanence, which both often take place in living rooms, most often take place in the better integrated areas of the house.

| | <1st quartile | 1st-2nd quartile | 2nd-3rd quartile | >3rd quartile | |
|---|---|---|---|---|---|
| **sleep** | 66% | 24% | 9% | 1% | 100% |
| **general permanence** | 23% | 14% | 15% | 48% | 100% |
| **meals** | 26% | 12% | 9% | 53% | 100% |
| **particular permanence** | 60% | 24% | 6% | 10% | 100% |

Table 4.9. Percentage of activity counts per quartile of integration.

In parallel, there is a lack of correspondence between the average integration values of

labelled rooms and activities that is demonstrated in table 4.11.. While an activity like sleeping, which occurs with few exceptions in one type of labelled space, the values of integration associated with other activities seem to be independent of any particular type of room. This may be an indication that spatial characteristics are favoured over any specific label for the exercise of certain types of activities.

### 4.2.3.3. Patterns of Collective Use

**a) Ways of Life**

Regarding collective life, the reports published in 1984 (Pereira and Gago) indicate, as we have seen, an increase of the time spent at home at the expense of neighbourhood relations. In fact, according to results published in the book but not made available as workable data, only 30% of inquired families reported having mutual aid relationships with neighbours, and most indicated family and friends as their major extra-household relationships. House-guests were reported as being mainly family members, while the inquired families reported receiving friends at home "frequently" in 16% of cases, or "seldom" in 46% of cases.

At home, the growth of media like the television was expected to have an impact on family relations. If mass media was indeed gaining importance during the 1970s, only 55% of the inquired families regularly watched TV, while 87% listened to the radio. As these activities are not discretised in the Survey and fall under the umbrella of general permanence, it is not possible to evaluate their impact in the collective life of the family, or relate these results to differences in social class.

It was also indicated in the published book that the increase of free time spent at home might have an impact on the relationships established between parents and children. The published reports informed that children were often unsupervised at home. Only 53% of families reported surveillance at home, in which cases it is mainly performed by women. However, when performing activities outside of the house, this number rises to 82%. In these cases, surveillance is performed not only by women, but also by older siblings. Women remain the ones most in charge of children supervision, confirming the idea put forth by Portas (1969) that a visual connection between the kitchen - where women, as we will see, spend most of their time at home - and the exterior space of the neighbourhood, may facilitate this task, while simultaneously putting women in closer contact with their children.

**b) General patterns of room use**

In order to provide a first understanding of how household members use the spaces of the house, the mean percentage of total amount of times each household member is registered at home by type of labeled space was plotted in table 4.10..

| ALL | WOMAN | MAN | SON | DAUGHTER | RELATIVE | EMPLOYEE |
|---|---|---|---|---|---|---|

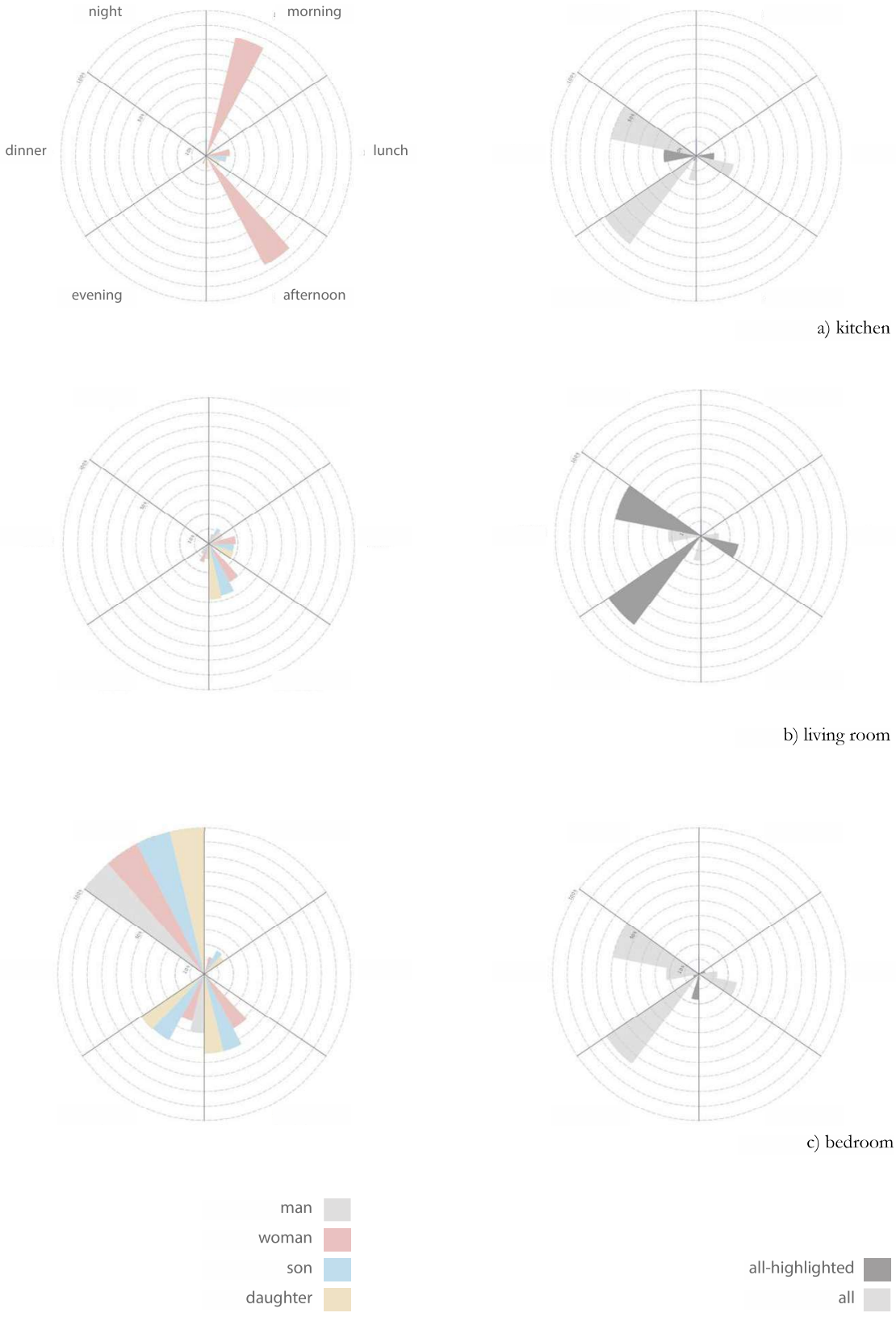



Figure 4.8.
Distribution of family members throughout the day for the three most common types of labeled spaces:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **bedroom** | 11.74% | 37.20% | 78.65% | 66.77% | 67.56% | 43.36% | 28.39% |
| **kitchen** | 15.76% | 37.59% | 3.27% | 5.39% | 6.87% | 26.55% | 48.39% |
| **living room** | 67.85% | 13.86% | 16.34% | 20.71% | 20.41% | 17.70% | 2.58% |
| **other space** | 4.50% | 5.95% | 1.31% | 4.10% | 2.58% | 7.08% | 19.35% |
| **exterior space** | 0.16% | 5.40% | 0.44% | 3.02% | 2.58% | 5.31% | 1.29% |
| | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Table 4.10. percentage of total counts of each household member in each type labeled room

Here, it seems possible to identify three different categories of household use patterns: The first groups men and children, who are registed in bedrooms an average of two thirds to three-quarters of the time-slots when they are at home in, and less than one-fourth of it in living rooms. The second pertains to women, who follow a different pattern of household use from men and children. They divide their time at home mostly between bedrooms and kitchens, spending only a small amount of their time at home in the living room. It is also of note that only living-in relatives spend a considerate percentage of their time at home in kitchens apart from women. Similarly, it seems to have some social meaning that the difference of time-slots registed in the kitchen between sons and daughters is minor. The third group relates to when all household members are registered as being in the same labelled space in the same time slot, through the use of the "all" category. When families are registered as gathering together, two-thirds of occurences take place in living rooms, confirming the common-sense intuition that living rooms are the spaces of the house with the most potential for collective use. Kitchens, where meals may take place, and bedrooms, which may be seen as more private spaces, show similar results to each other.

A finer reading of the ways different household members use the spaces of the house is provided in figures 4.8..a, b and c, to which the element of time was added. These represent the distribution of family members throughout the day for the three most common types of labelled spaces: living rooms, bedrooms and kitchens. The grey charts, representing the mean percentage of the total amount of times the category "all" is counted in a living room by time-slot, further confirm this type of space's potential for collective use. It indicates that household members are most likely to gather collectively in living rooms than in any other type of space, and particularly during the evening and dinner-time. In smaller percentages, the "all" category is also registered in kitchens during meal-times, and in bedrooms during the evening. While the other categories of household members are not capable of providing information on co-presence due to the limitations explained in 4.2.1., it seems nonetheless noteworthy that when family members are registered individually, they are registered in bedrooms the majority of times (independently of time-slot), and less so in living rooms. Children are those who are more often registered individually in living rooms, as opposed to men, most registered in bedrooms, and women, who seem to spend most of their time at home in the kitchen. In this sense, while children and men appeared to have a similar pattern of room occupation when time-slots were not taken into account, this added layer of data


Figure 4.9.
Percentage of counts of activities in type of room for lower and upper lower-class (top), middle-class (middle) and upper-class families (bottom)

introduces apparent differences in the way these family members use the house.

A similar table to 4.10. was plotted in order to provide a first understanding of how activities are distributed across types of rooms: the percentage of total counts of each activity is registered in each type labelled room was plotted in table 4.11.. Here, again, different patterns could be identified according to the type of activity and type of room. Regarding activities or rooms with the most collective potential, two groups have been identified:

| | SLEEP | PROFESSIONAL ACTIVITY | STUDYING ADULTS | STUDYING | ADULT GUESTS | YOUNG GUESTS | PARTICULAR PERMANENCE | GENERAL PERMANENCE | CHILDREN'S PLAY | REGULAR MEALS | WEEKEND MALS | SPECIAL MEALS | PREPARE MEALS | CLOTHES | WASH/DRY CLOTHES | SEWING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **bedroom** | 93% | 45% | 50% | 37% | 20% | 37% | 81% | 33% | 55% | 5% | 9% | 3% | 0% | 40% | 2% | 53% |
| **kitchen** | 0% | 0% | 0% | 8% | 2% | 1% | 5% | 5% | 7% | 27% | 15% | 1% | 100% | 17% | 77% | 6% |
| **living room** | 4% | 45% | 50% | 49% | 75% | 56% | 12% | 58% | 26% | 62% | 70% | 94% | 0% | 28% | 3% | 32% |
| **other space** | 3% | 0% | 0% | 5% | 4% | 5% | 2% | 5% | 4% | 6% | 6% | 2% | 0% | 14% | 11% | 9% |
| **others** | 0% | 10% | 0% | 1% | 0% | 0% | 0% | 0% | 8% | 0% | 0% | 0% | 0% | 1% | 8% | 0% |
| | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

Table 4.11. percentage of total counts of each activity in each type labeled room

The first encompasses meals. As we have seen in figure 4.8., it is common for the "all" category to be registered in living rooms during dinner-time. Here, it seems to be further confirmed that meals take place mainly in living rooms. Additionally, meals seem to become less likely to take place in kitchens the less ordinary they are: while 27% of daily meals take place in the kitchen, only 15% of weekend meals do and only 1% of special meals. The previous figures provide information that may indicate that when the entire family is present during meal-time, this meal is more likely to take place in living rooms: the household member category "all" was seldom registered in kitchens; the same category was more often present in living rooms during dinner than during lunch; men are only home from the evening onwards (there being not enough data to know whether they spend less time than the woman at home when not at work); and children also seem to be more present from the afternoon onwards. It is also interesting that with only 3% to 9% of all types of meals being recorded in spaces labelled as bedrooms and 2% to 6% in spaces labelled as other spaces, this dataset doesn't seem to reflect Portas (1969) concern that many families gave up bedrooms in situations where livingrooms lacked privacy in order to have a formally defined place to display their dining furniture.

The second group of activities can be identified encompassing those that take place either in living rooms or bedrooms. These are mostly activities that take place during household member's

free time at home - as opposed to domestic chores - and that may assume varying levels with desired interaction with other family members. Some of these are tendentially individual activities, such as studying or working at home, others objectively social, such as receiving guests, and others, such as "permanence" - what one does in their free time - or playing, may be both. It is, in particular, non-determined collective or individual character of many of the activities that are part of this group that may tell us something about the collective life of the family, as well as the relationship between children and parents.

Considering that the data excludes cases of overcrowding, it is assumed that conditions exist in each household for activities that require a quiet environment to be conducted in such spaces. Therefore, for example, that in 57% of reported cases, children study in living rooms and kitchens rather than in bedrooms, may be more indicative of the relationship established with parents and their growing involvement in children's education, than of a lack of an adequately quiet place to work. If the simplification of table 4.11. does not provide enough data to know whether this choice is exclusionary (the same children either always study in the kitchen or always in the bedroom), it does indicate that a significant amount of studying is done in potentially collective areas of the house. It is also worthy of noting that professional activities and studying adults are also activities that are not predominantly registered in private spaces but are instead evenly divided between bedrooms and living rooms.

It was seen in table 4.10. and figure 4.8. that household members are more often registered in bedrooms than in social areas of the house, but that they are more likely to be registered as part of the "all" category in the latter. Table 4.11. shows that, while some individual activities take place in living rooms, bedrooms also gather a set of activities with social potential. It is exemplary of this that children seem to chose bedrooms as a place to play rather than living rooms and kitchens shared with their parents, that the large majority (81%) of activities of personal permanence (those activities that are carried on individually in one's free time at home) are registered in bedrooms, that only 58% of activities of general permanence (activities of a social nature) are recorded in living rooms and 5% in kitchens, while around a third were recorded in bedrooms.

In order to understand if some of these tendencies of space use may be related to class differences, figures 4.9a, b and c were plotted. In regards to what was observed before, it is interesting that individual activities such as adults studying or working from home are exclusively performed in bedrooms in upper-class households while remaining distributed between living rooms and bedrooms both in middle and lower classes. It is also of note that more activities that are not domestic chores are performed in kitchens in lower-class households than in the other classes.

**c) Differences in patterns of room use according to spatial attributes**

From this early description of patterns of room use, a set of questions was identified that seemed of particular interest to be further explored:

1) What are the spatial attributes of living rooms that gather the most variety of activities, of those that gather also individual or mainly social activities? Do these differ from those of living rooms that gather less?

2) What are the spatial attributes of living rooms that gather the most household members? Do these differ from those of living rooms that gather less?

In a first moment, this was approached by simple visualisation. A table was plotted representing the percentage of times each activity was registered in each room for each apartment scheme in the dataset and colour-coded in order to make it easy to identify where variation or concentration of the same types of activities may relate to the apartment scheme's configuration or other spatial properties. The same process was conducted in regards to the percentage of times each household member was registered in each room. While this type of visualisation is flawed for assigning more significant weight to apartment schemes used by a small number of households, it proved an important aid throughout the process of exploratory analysis.

It allowed to intuit, for example, that the number of activities performed in a living room may be connected to its area. Table 4.12. seems to support the hypothesis that a relationship may exist between the area of a living room and the number of activities, and particularly between the relative size of a living room (the percentage of the house occupied by this space) and the number of activities registered within it, as mean values of relative size do seem to grow steadily as activities add up. However, when activities are divided by type, this relationship seems to decrease.

| **number of activities** | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| **average relative size** | 10.67 | 12.12 | 13.29 | 14.57 | 13.33 | 17.46 | 18.96 | 20.52 | 20.23 | 21.97 |
| **number of social activities** | 0 | 1 | 2 | 3 | 4 | | | | | |
| **average relative size** | 12.07 | 14.12 | 18.72 | 15.86 | 17.21 | | | | | |
| **number of private activities** | 0 | 1 | 2 | 3 | | | | | | |
| **average relative size** | 13.46 | 16.84 | 15.67 | 2.94 | | | | | | |
| **number of chores** | 0 | 1 | 2 | 4 | | | | | | |
| **average relative size** | 14.61 | 17.67 | 18.56 | 14.73 | | | | | | |

Table 4.12.
Average room relative size per number of activities.

Similarly, when the same was attempted in regards to integration, as shown in table 4.13., no relation could be visually detected. As such, while, for example, social activities seem to be more likely to be registered in highly integrated spaces, the values of integration do not seem to have a significant impact on the number of social activities performed in one same living room. This result may indicate that while integration seems to have some impact on the type of activities that are performed in one same room, it does not necessarily have an impact on the number of activities.

| number of activities | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| average integration | 1.45 | 1.07 | 1.11 | 1.15 | 1.02 | 1.28 | 1.09 | 1.41 | 1.42 | 1.99 |
| number of social activities | 0 | 1 | 2 | 3 | 4 | | | | | |
| average integration | 1.06 | 1.18 | 1.26 | 1.15 | 1.39 | | | | | |
| number of private activities | 0 | 1 | 2 | 3 | | | | | | |
| average integration | 1.12 | 1.23 | 1.04 | 0.77 | | | | | | |
| number of chores | 0 | 1 | 2 | 4 | | | | | | |
| average integration | 1.12 | 1.36 | 1.38 | 1.27 | | | | | | |

Table 4.13. Average value of room integration per number of activities.

While area and integration seem to have, if any, a minor relation to the number of activities registered in living rooms, their connection to the other types of spaces in the house seems to have a more significant impact. The relationship between activities that can either take place in living rooms or bedrooms was explored as illustrated in table 4.14., which shows the percentage of time-slots where activities are registered in living rooms according to their depth from the nearest bedroom. The table, if preliminary, seems to indicate that the shallower the living room is from bedrooms, the more some types of activities are registered as taking place in it. The same seems to work in the opposite direction. Going back to Portas' (1969) concern with extra bedrooms being used as dining-rooms, it is worth noting that, while only 5.3% of all bedrooms were registered as being used for any kind of meal, this number rises to 20% in spaces that while labelled as bedrooms are both not used for sleeping and open directly to the living room.

| depth from bedrooms | 1 | 2 | 3 |
|---|---|---|---|
| general permanence | 72% | 65.0% | 52.0% |
| children's playing | 18.75% | 18% | 11.80% |
| studying | 60.40% | 54.70% | 55.90% |
| personal permanence | 4.17% | 1.44% | 7.35% |
| clothes | 45.80% | 32.80% | 15.40% |

Table 4.14. Percentage of living rooms where certain activities take place according to depth from bedrooms.

When living rooms are located in between bedrooms and kitchens, making it impossible to go from one to the others without moving through them, the results seem to suggest that living rooms are more used by household members and also gather a more significant number of household members in the same time-slots. As can be seen in table 4.15., this is the clearest in regards to children, whose number of counts in living rooms doubles when this space is in between the kitchen and the bedrooms. While the amount of household members registered in the same space in the same time-slot is not, as we have seen, necessarily an indicator of co-presence, the values in table 4.15. are still worthy of note. In regards to all time-slots except for dinner, the amount of household members registered in the living room is largely higher when this space is located between the kitchen and the bedrooms.

| location of living-room | woman | man | son | daughter | all |
|---|---|---|---|---|---|
| between kitchen and bedrooms | 0.64 | 0.20 | 0.81 | 0.82 | 0.98 |
| independent | 0.41 | 0.18 | 0.40 | 0.38 | 0.64 |

Table 4.15. Average counts in living room per household member, where 0 represents no counts and 1 represents an average of one count per living room. Counts were summed across times of day and, as such, values may rise above 1.

| location of living-room | morning | lunch | afternoon | evening |
|---|---|---|---|---|
| between kitchen and bedrooms | 6.55% | 20.78% | 20.53% | 23.28% |
| independent | 2.90% | 9.47% | 13.14% | 15.04% |

Table 4.16. Mean percentage of family members counted in the living room per time slot.

When adding to the previous situation, the living room and kitchen are articulated - either through direct access or visual connection - household members are similarly more likely to be counted in these areas:

| articulation kitchen/living room | morning | lunch | afternoon | evening |
|---|---|---|---|---|
| social pole | 5.58% | 15.13% | 18.82% | 19.62% |
| independent | 2.38% | 8.78% | 10.49% | 15.35% |

Table 4.17. Percentage of household members counted in the living room when it is articulated to the kitchen or independent.

### 4.2.3.4. Patterns of Private Appropriation

#### a) Ways of life

We have seen in chapter 4.2.1. that the sample selected for the Survey excluded cases of overcrowding. The published reports indicate that 70% of the sampled families have 3 to 5 members and mostly consist of couples with children. 41% of households have 4 members (as should be indicated by the preponderance of 3 bedroom apartment schemes in the sample). 60% of the sampled families have 1 or 2 children. Of the entirety of sampled children, 43% are aged 7 to 14 years old, 21% 15 to 18 years old, 19% are over 18 years old, and 17% are younger than 7 years old. It seems that most school-aged children are in school, as 61% of children are students. 20% of them are student-workers and 10% perform a professional activity.

Nevertheless, around a quarter of inquired women reported feeling the need for larger spaces and that 59% of them feel the need for more rooms, in particular bedrooms (26%). In this sense, 38% of families made alterations to their houses in order to create more spaces (the configurational character of these alterations has been explored by Moreira and Serdoura, 2017). Additionally, almost every family (98%) reported feeling the need for a balcony or a small yard, where children could play and from where adults can enjoy the outdoors.

There is little information in the reports regarding which types of individual activities were performed by family members. The reports inform that most of the inquired families did not read books or magazines, although men frequently read the newspaper. It is also indicated that children are in most cases allowed to play everywhere in the house, with only 27% of families reporting imposing some limitations, which may suggest that children do choose to play in bedrooms, as seen in chapter 4.2.2.3..

### b) General patterns of room use

The previous section has focused on spaces and activities that might be connected to patterns of interaction and co-presence between family members. This section will focus on how household members exist individually in the space of the house and, further on, on the spatial potential of apartment layouts to allow for privacy.

As we have seen in table 4.10., men and children spent, respectively, 79% and around 67% of their time at home in their bedrooms, while women only spent 37% of their time in the same type of spaces. If it is important to note that these percentages include the time spent in bedrooms at night, sleeping (which should account for 16.7% of these percentages), there remains a significant amount of time spent in bedrooms in opposition to more commonly social spaces of the house. In order to understand if this comes from a desire to be alone, two questions should be further explored: in which spaces did household members spend more time by themselves, and what kinds of activities were more often associated with which types of spaces?

| | | living room | kitchen | bedroom | total counts alone | total counts |
|---|---|---|---|---|---|---|
| morning | women | 13 | 172 | 19 | 204 | 319 |
| | men | 4 | 0 | 0 | 4 | 8 |
| | son | 10 | 0 | 26 | 36 | 75 |
| | daughter | 9 | 0 | 19 | 28 | 75 |
| lunch | women | 2 | 7 | 2 | 11 | 106 |
| | men | 14 | 0 | 1 | 15 | 35 |
| | son | 2 | 2 | 1 | 5 | 73 |
| | daughter | 5 | 0 | 1 | 6 | 61 |
| afternoon | women | 38 | 173 | 59 | 270 | 443 |
| | men | 2 | 0 | 6 | 8 | 26 |
| | son | 22 | 0 | 44 | 66 | 190 |
| | daughter | 19 | 0 | 49 | 68 | 207 |
| evening | women | 12 | 12 | 23 | 47 | 147 |
| | men | 10 | 0 | 46 | 56 | 127 |
| | son | 5 | 1 | 69 | 75 | 129 |
| | daughter | 5 | 0 | 56 | 61 | 113 |
| total | women | 65 | 364 | 103 | 532 | 1015 |
| | men | 30 | 0 | 53 | 83 | 196 |
| | son | 39 | 3 | 140 | 182 | 467 |
| | daughter | 38 | 0 | 125 | 163 | 456 |

Table 4.18. Total counts of household members alone in a room.

Regarding the former, table 4.18. was constructed. It illustrates the number of times household members were registered as the only ones in a determined room during a determined time-slot and compares it to the total amount of times the same household members were registered as being

at home (either by themselves or in rooms where other members are also registered). Dinner-time, for the small number of counts outside of the category "all" and night-time, for concerning mainly the activity of sleeping, were not included in the table. The first thing that stands out is that family members were registered as being the only ones in a room during a time-slot a large number of times. Women were registered as being alone in rooms more than half of the times they were registered at home, and other household members appeared alone between 35.7% of times (daughters) and 42.3% of times (men). The table also confirms a series of observations from figure 4.8. regarding the distribution of household members in the house throughout the day, adding a new layer of information.

When the two are read in articulation, it seems to be possible to form an idea of how household members move around the house during the day. Children and men are not often registered at home during the morning and lunch-time when men are likely to be at work and children in school. When at home in the morning, they are more often in bedrooms. These are where children are more often registered alone. Women are registered at home throughout the day, in particular in the morning and the afternoon. Again, due to the character of the "all" category, women may be equally present at home throughout the day. During these periods, they are mainly registered as being in the kitchen, often by themselves. In the afternoon and evening, when children and men start being registered as being at home, they are more often counted individually (not as a part of "all") in bedrooms. These are the spaces and time-slots where children are more often counted as being alone, although the increase of the "all" category in living rooms during the evening may suggest that bedrooms are where they choose to be alone, whereas living rooms is where they choose to be with others, in particular in regards to this time-slot. The difference between time spent alone in a bedroom or a living room is considerably lower for men than for children. Even though most of the time women are registered by themselves in kitchens, they are also counted as being the only household members in living rooms and bedrooms, in particular during the afternoon.

Regarding how activities are distributed across spaces, we must go back to table 4.11., where it was observed that there does not exist a clear distinction between individual and social activities in regards to the types of rooms where they take place. It was noted, for example, that children often seem to choose to study in living rooms and kitchens rather than in bedrooms, while however choosing to play in bedrooms. Similarly, it was also seen that while activities of general permanence (of a social nature) are most often recorded in living rooms, they are also recorded in bedrooms a significant amount of times. Now, looking specifically at the types of activities performed in bedrooms, the idea that this distinction is not clear is further confirmed: 80.4% of bedrooms are used for sleeping in - a mostly private activity, benefiting from isolation and quiet, 23.9% of them are used for studying - a similarly individual activity that may benefit from the same sort of qualities, and 30.9% are used for particular permanence - a general umbrella encompassing individual leisure activities. However, potentially social activities are also present:

41.4% of bedrooms are used for playing by children, 19.8% for general permanence, and 19.2% for receiving guests.

**c) Differences in patterns of room use according to spatial attributes**

Even though the data do not present a clear distinction in the types of rooms where individual and collective activities take place, we have seen in chapter 4.2.3.2. that activities in the dataset seem to connect to spaces with integration values in a determined pattern, which has also been verified in Monteiro (2007). In that chapter, we have seen that social activities tend to be on average associated with the most integrated spaces in their layouts. However, while eating-related activities and receiving adult guests (an activity which often takes place during dinner) are the most integrated, these are followed by studying and only then by general permanence and receiving young guests. These activities of a more social character were followed by domestic tasks and then, at the bottom of the chart, by sleeping. When household members are similarly organised by integration, as illustrated in figure 4.10. and table 4.19., there does not appear to exist a similarly consistent pattern of integration values as that observed for activities.

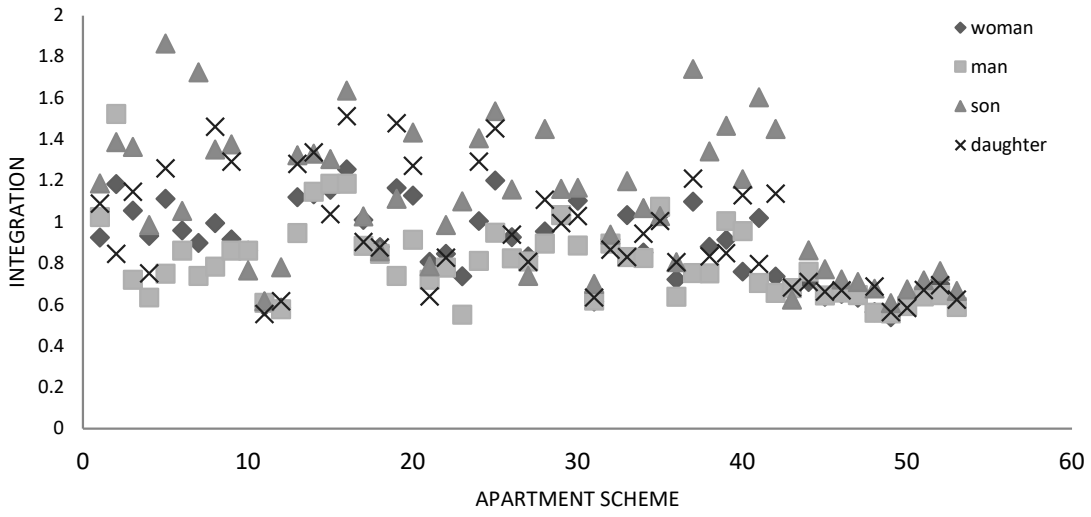



Figure 4.10. Average integration of spaces where household members are registered.

| | <1st quartile | 1st-2nd quartile | 2nd-3rd quartile | >3rd quartile | |
|---|---|---|---|---|---|
| **man** | 25% | 13% | 9% | 53% | 100% |
| **woman** | 40% | 12% | 18% | 30% | 100% |
| **son** | 43% | 12% | 9% | 36% | 100% |
| **daughter** | 32% | 12% | 15% | 41% | 100% |

Table 4.19. Percentage of time spent in spaces per quartiles of integration in each apartment-scheme.

Women appear to spend more time in the less integrated spaces of the house than men, which may be supported by the fact that women perform domestic tasks in kitchens. It was also verified

that, during the night time-slot, both men and women tend to score below average integration. In order to explore this result, the total of 803 bedrooms in the dataset was divided in bedrooms belonging to parents (240), children (398) (sons (218) or daughters (196)), or others (195), according to which family members were recorded as using each of those labelled spaces during the night time-slot. Then, for each category in each household, the mean values of integration, area and depth from the exterior were calculated, as is illustrated by table 4.20.. These preliminary results seem to indicate that spatial attributes may have some impact on how bedrooms are attributed to family members. It seems, for example, that parents' bedrooms may be deeper from the exterior and larger than children's.

| | average bedroom | other bedrooms | children's bedrooms | parents bedrooms |
|---|---|---|---|---|
| **area** | 9.06 | 8.09 | 8.92 | 10.17 |
| **integration** | 0.75 | 0.71 | 0.77 | 0.74 |
| **depth from the exterior** | 3.93 | 3.62 | 3.96 | 4.12 |
| **sum of activities** | 2.49 | 2.03 | 2.9 | 2.14 |

Table 4.20.
Mean spatial attributes of bedrooms according to type of occupant.

The activity of sleeping (paralleled only by the activity of special meals) establishes the most consistent activity-labelled space relationship and was recorded in 93% of times in spaces labelled as bedrooms. However, while sleeping mostly takes place in bedrooms, there are 19.6% of bedrooms in the totality of households in the dataset that are not assigned to household members and do not accommodate that activity. Smaller rooms that are shallower from the living room tend not to be used as bedrooms. Of those opening directly to living rooms only 69% are used to sleep in, while when two topological steps away from a living room 78% of the cases are used as traditional bedrooms, and when three steps away 90% are used as bedrooms. The same relationship seems to be established between bedrooms and entrance areas. When one topological step away from the entrance, only 57% of rooms are used to sleep in, when two steps away only 66%, when 3 steps away 71.4%, with the percentage continuing to grow until the case of bedrooms located six topological steps away from the entrance (the deepest bedrooms in the dataset). Due to the usual proximity between livingrooms and entrance areas, this result does not make it possible to know whether either or both have an impact on the way bedrooms are used.

The labelled bedrooms that do not effectively function as bedrooms are most often used during the afternoon and evening, the same periods when household members are more often signaled as being in bedrooms (as verified in figure 4.8.). In 48% of cases these labeled bedrooms are used by women and, in 35% of cases, by children. Table 4.21. was plotted in order to explore what kind of activities are registered in these labelled bedrooms, according to whether they are actual bedrooms or not. Some activities seem to be fairly incompatible with spaces where people sleep, such as meal-related activities, or social activities such as receiving guests of those pertaining

to general permanence. Rooms where professional activities take place also seem likely be turned into offices, as they are much more often registered in rooms where sleeping doesn't take place. Contrarily, some activities seem to be complementary. Playing is not only registered mainly in bedrooms (over collective labelled spaces), as it is registered more often in bedrooms where people sleep. Similarly, particular permanence is also more often registered in these types of spaces.

| | registered sleeping | did not register sleeping |
|---|---|---|
| **regular meals** | 0.15 | 8.92 |
| **special meals** | 0.62 | 2.55 |
| **weekend meals** | 1.08 | 7.64 |
| **general permanence** | 14.86 | 40.13 |
| **adult guests** | 8.98 | 15.29 |
| **young guests** | 8.67 | 10.19 |
| **children's play** | 46.9 | 18.47 |
| **personal permanence** | 35.6 | 11.47 |
| **studying** | 23.07 | 27.39 |
| **professional activity** | 1.86 | 7.64 |
| **clothes** | 16.87 | 58.6 |

Table 4.21. Percentage of times activities are counted in bedrooms where the activity of sleeping has been registered or not.

The data also seem to suggest that the relationship between bedrooms and the main social space of the house, the living room, may have an impact on the kind of activities that take place in the first. For example, while we have seen that it is uncommon for bedrooms to be used for meals, the number of times meals are registering as taking place in bedrooms does seem increase when these are not used to sleep in, and are one or two steps away from the living room. Regarding bedrooms that are actually used to sleep in, it seems like the data may indicate that general permanence in these areas decrease as the rooms become deeper from the living room and that, conversely, particular permanence increases as depth from the living room increases as well.

### 4.2.3.5. Organisation of Women's Life at Home

#### a) Ways of life

The final reports of the Survey indicated that only 20% of the inquired women undertook a professional activity outside of the home. Of these, 80% indicated financial reasons as a motivation for working and 7% indicated they worked in order to guarantee the family's future. Only around 10% indicated motivations of personal professional accomplishment, and less than 5%

indicated financial independence from their husbands or mental hygiene as reasons to maintain a professional activity. However, it was seen in figure 4.4. that lower class families had a smaller percentage of working women than middle and upper-class families. As only the man's income was considered in defining the socioeconomic character of families, it cannot be said that these middle and upper-class families are wealthier because women work. As such, even though financial reasons are the most common for women to work, the percentage of women who do only reaches around 14% to 19% in the lower classes, and raises to 26% to 33% in middle and upper class families.

At home, the study indicates that women are the main responsible for 68% to 82% of domestic chores. Around 35% of households have a hired housekeeper, and children help with only 5% to 16% of domestic work. In this dataset, neither men nor other living-in relatives contribute significantly to domestic tasks. It is not possible, with the available data, to know whether these percentages vary across class, or according to whether or not women hold a professional activity.

These two aspects of women life easily explain why women are the members of the household who consistently spend the most amount of time at home. In general, women are signaled as being at home in the morning in around 85% of cases, 45% during lunch, 80% in the evening, 5% during dinner and 100% at night. It is reasonable to assume that during the evening and dinner-time, women would count as part of the 'all' category (which is reported as existing in 80% of both time-slots), leaving only lunch-time as a time-slot when it is not certain whether women are at home or not.

**b) General patterns of room use**

It has been repeatedly shown in the previous points that women display patterns of house-use that are substantially different from those of men and children, which are more similar between themselves. Women divide their time at home between the bedroom and the kitchen, presenting a smaller percentage of time spent in the living room than children, but fairly close to that of men. The same is verified regarding their presence in the living room during the different time-slots, where their presence seems to be very similar to that of children. This may indicate that it is during the day, when men are at work and children in school, that women spend most of their time in the kitchen and bedrooms, as was supported by table 4.18. (page 130.), which shows that it is during the morning and afternoon that women spend more time alone, 35.9% of which in the kitchen. This is also further supported by table 4.22., which illustrates the percentage of households where women are registered as being in the kitchen during the different time-slots, considering whether or not they hold a professional activity. It is particularly telling that women who work professionally from home are counted almost half the time in kitchens as women who don't work. The results pertaining to women who work outside of the house, due to very small representation in the dataset, as well as the convergence of kitchen-use in the small sample of

working women, cannot be reliably interpreted.

Table 4.22. Percentage of woman counts that take place in kitchens, according to women's occupation

| | morning counts in KT | lunch counts in KT | afternoon counts in KT | evening counts in KT | dinner counts in KT | total counts in KT |
|---|---|---|---|---|---|---|
| **does not work** | 93.62% | 20.74% | 92.02% | 5.32% | 1.06% | 42.55% |
| **works at home** | 46.81% | 2.13% | 65.96% | 8.51% | 0.00% | 24.68% |
| **works outside** | 100.00% | 0.00% | 100.00% | 0.00% | 0.00% | 40% |

Living-in relatives are the only other type of household members that spend a considerate percentage of their time at home in kitchens. Even though they were not added to all graphs and tables due to their small representation in the dataset, these are often retired parents of the main couple, and spend a great amount of time at home. However, as it was indicated before, living-in relatives don't offer any significant help in domestic chores.

Table 4.9. (page 120) showed that the kitchen, for its fixed feature elements, necessarily concentrated activities such as meal preparation and washing and drying clothes. The table also showed that meals are more likely to take place in living rooms, with some instances of daily or weekend meals taking place in kitchens. Activities with social potential are uncommon in kitchens: 21% of these spaces register studying - a mostly individual activity that may be conducted with the help or company of others, only 10% register general permanence, 8.2% playing and 2.5% personal permanence. Other, non fixed-function domestic chores such as those pertaining to the treatment of clothes, almost exclusively carried out by women, are registered in bedrooms 40% to 53% of times, and around 30% of times in living rooms. The data seem to suggest, then, that not only are social activities not common in the kitchen, but domestic tasks are also not very common in social areas.

Here, as seen in figure 4.9. (page 124), it seems possible that class plays a role in the way these activities are distributed. The kitchen, in general, seems to be used for a wider variety of activities in lower class households than in other classes. Even though kitchens are not larger or more integrated in lower class apartments (as seen in 4.2.3.2., cooking is one of the less integrated activities for this class), activities with potential for socialization or co-presence such as studying, receiving guests or general permanence, only take place in kitchens in lower class households. Simultaneously, domestic work such as that pertaining to the treatment of clothes, seems to take place more often in living rooms in this class than in the others. On the contrary, while cooking is one of the better integrated activities for middle class families, these seem to mostly use the kitchen for those fixed activities that can't take place anywhere else in the house Instead, as in upper class families, activities with varying degrees of socialisation, take place between the living room and the bedrooms.

**c) Differences in patterns of room use according to spatial attributes**

The data presented so far regarding women's use of the space of the house seem to indicate three aspects to take into further examination: that women are the ones in charge of household work; that these activities are mainly registered in kitchens and bedrooms; that they spend most of their time at home alone in the kitchen, while also being registered in living rooms during the same time-slots as children and men.

Regarding the types of spaces more likely to be used by women for domestic work, we have seen in table 4.11. (page 125) that activities related to the treatment of clothes were more often registered in living rooms that are one step away from the nearest bedroom, while also being more often registered in bedrooms that are not used for sleeping - usually the shallower and smaller rooms in the house. However, table 4.14. (page 128) shows fairly inconclusive results in regards to the existence of any relation between depth and the use of bedrooms for domestic tasks: while the amount of times these activities are counted in bedrooms does seem to decline as depth from the exterior increases, this is not a linear relationship, with 43% of bedrooms 3 steps away from the exterior being used for treating clothes, while only 27% of rooms 2 steps away from the exterior are used in the same way. However, we have seen in chapter 4.2.2. that domestic chores are usually associated to mid-values of integration, and in figure 4.10. (page 132) that women are often signaled in less integrated spaces. Table 4.23. suggests that this may be countered by the integration of the living room, as it shows that slightly higher values of integration are associated to a larger number of household activities being registered in the same living room.

| number of domestic tasks | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| integration of the living room | 1.11 | 1.36 | 1.38 | 1.27 |

Table 4.23. Integration of the living room per number of domestic tasks eprformed in that room.

Regarding the integration of women with other family members, it has been shown in table 4.15. (page 125) that women (and children, to an even larger extent) are more present in living rooms when these are located in between the bedrooms and the kitchen in such a way that it is not possible to move from the first to the second without going through the living room. The same is not verified in the inverse relation, and family members do not seem to be more or less present in kitchens regardless of this configuration. Similarly, the results seem to suggest that the placement of the kitchen, its area and its configurational properties don't have but minor implications on the number of family members that use it.

## 4.3. Preliminary Findings and Conclusions

When the Portuguese Laboratory of Civil Engineering started experimenting with methods for relating empirical data with spatial attributes in the late 1960s, it aimed not only at understanding how families lived the domestic space and so facilitate the development of housing adapted to a transforming society, but also at providing architects with tools that should make it possible to confront their objectives with the potential outcomes of their work. Even though the analysis of the Survey on Urban Housing was not explored as far as ideally intended at the time, it proved that an analysis not taking into account extensive spatial attributes was already capable of giving clues of the way families lived. The preliminary results presented throughout this chapter seem to suggest that taking the analysis further may indeed tell us something about the relationship between the configuration of spaces and the ways families use them.

The work of analysis developed in the scope of this dissertation had the intention of providing an empirical basis for constructing an understanding of the familiar dynamics and types of space use of Portuguese families in the 1970s, which may further inform the analysis of the case study, within a set of limits imposed by the dataset itself, such as a small sample and ambiguous variables. Nevertheless, the analysis conducted seemed capable of finding relationships, some of them transversal across different cultures, between spatial attributes of apartment layouts and the domestic activities conducted by families, that are indicative of patterns of space use associated with those questions that concerned social housing development at the time the Survey was conducted:

**Factors contributing to sociability in the household:**

Living rooms, for their capacity for functioning as spaces of reunion and co-presence, appeared as likely spaces of sociability in the household. However, while these were the spaces where family-members were the most registered in the same time-slot, as well as those most often used for the reunion of the entire family, bedrooms were as often preferred spaces for activities with social potential. As these also appeared to be spaces more likely for individual use, the type of sociability in the household seemed to be reflected both in the amount and frequency of inherently social activities, as well as the social or individual character of activities such as meals, studying or children's play. It was seen that the inherently collective activity general permanence was the most often registered in highly integrated spaces, and that the centrality type of the house being functional (and in particular when the most integrated space was the living room) might be conductive to more types of activities being registered in living rooms. No other syntactic attributes were possible to be identified as having a significant impact on the amount or type of activities taking place in living rooms, and area and the relative size of the room were suggested to have only a minor relation to the amount of activities registered in this type of space. However, the analysis

suggested that when living rooms are mandatory through-spaces between bedrooms and kitchens or the exterior they are more likely to be used in moments where the whole family is at home, as well as increasing the amount of time spent in them by women. Similarly, the existence of a social pole including a kitchen and a living room might be conductive of more family members spending time in living rooms. However, because these two situations can often be verified simultaneously, it may be that only one or the other have an actual effect, or that it might depend on a combination of the two.

**Factors contributing to the possibility of privacy between family members:**

The apartments in the Survey's dataset exclude cases of overcrowding. As such, each household has as many members as the number of bedrooms of their apartment scheme, plus one or two. According to the data regarding house use, this by itself seems to be enough for providing the potential for household members, in particular children, choosing to be alone. In fact, all family members are registered as being the only ones in a room in a large amount of time-slots. Children are those who are registered alone in less time-slots, and seem to spend most of that alone time in their bedrooms. In general, they are also often registered in living rooms, which, in articulation with the indication by the majority of inquired families that no impositions are made regarding where children may and may not play, may be an indication that being alone or not is a choice they are allowed to make. Simultaneously, children's bedrooms seem to be better integrated than those of parents, which may perhaps justify an easy coming and going from bedrooms to living rooms, and create a feeling of closeness to the rest of the house when in their bedrooms.

Men, while spending less time at home, are more likely to spend it by themselves than children, and, curiously, are similarly likely to be alone in bedrooms as they are in the living room. That being alone may be a choice for these family members seem to be further suggested by the fact that bedrooms (the type of space where men and children are more likely to be counted as being alone) are not exclusively individual spaces. In particular children's bedrooms often register potentially or inherently collective activities.

Women, like in other situations, display a different pattern from those of children and men when it comes to being alone. They are the family members who are registered alone in more time-slots, and are more often registered alone in kitchens. This suggests that women are often alone, regardless of their preference, because they have to: they are forcibly alone when men are at work and children are at school, and they are often alone in kitchens because they are solely responsible for housework in the great majority of cases. However, when apartment layouts have extra rooms, allowing them not to be used as bedrooms, these are often used by women and children. Clothes related activities (including sewing) are the most common in this type of room, followed by general permanence and then studying, which may indicate that these may function as secondary living rooms, directed to certain activities that may bring women and children together.

**Factors contributing specifically to woman's integration or segregation:**

Similarly, the differences in the pattern of house use verified in women in relation to other family members should be further explored if the forms of their segregation in the household are to be understood. The Survey showed them spending a much higher percentage of the day at home in relation to men and children and, shown in the data to be singlehandedly in charge of all household work, this time was consistently spent in kitchens. Even though the data suggested that women spent a similar amount of time in living rooms as other family members during the times of the day men and children were at home, the data, as we have seen, is ambiguous in relation to what the count of family members in rooms actually means. Furthermore, as they were registered as being in different spaces during the same time-slot, it may be assumed that women's time is living rooms is split with time spent in other spaces. As such, it is still likely that women performed activities like preparing meals during these time-slots, and is consequently important to focus on the integration of kitchens, as well as on the type of relationship established with the other spaces of the house.

Contrarily to livingrooms, the area and integration values of kitchens seem to relate positively, if having a minor impact, to the number of activities taking place in the kitchen, but none to the amount of family members who regularly used it. In fact, as the activities most affected by this variance were those related to domestic work, an increase in activity number has no significant relation to the kitchen's role as a space of reunion or co-presence, meaning instead that women are likely perform most chores in kitchens in opposition to bedrooms – where children may be playing or studying – or living rooms – where the whole family does assorted activities. As no spatial attributes or relations established with specific types of room could be found that related to more counts of other family members in kitchens, the data seems to suggest, as women have been verified to make most of their appearances in the kitchen, that the only factors contributing to their integration with other household members would have been either the direct connection of living rooms and kitchens, which may result in a larger amount of times women are signaled in living rooms, or the visual opening of kitchens and living rooms, allowing for women to more easily interact with other household members.

### 4.3.1. FUTURE WORK

The Survey on Urban Housing (Pereira & Gago, 1986) constitutes, even today, one rare example, in Portugal, of an exhaustive sociological field survey of great relevance for the disciplinary field of architecture. Furthermore, its analysis in the scope of this dissertation was preliminary, as its role within the research was of informing the interpretation of the case study. With respect to a different population, this role was limited. These preliminary results have provided some information on the ways of life of families in the 1970s, that is supported by other research conducted during that period. They were also able to demonstrate that, to some extent, spatial and configurational attributes have an impact in the way houses and rooms are used by the family and types of family members.

As such, the dataset appears to have the potential for further examination, and its broad availability should be useful for future research. In that sense, the data gathered and systematised for this dissertation is being reorganised in a database that will simplify its reading[38]. This project should follow by contacting the LNEC in an effort to make an organised set of data available for future investigation. The complete set of information for 279 households was organised in the relational scheme shown in figure 4.11.:

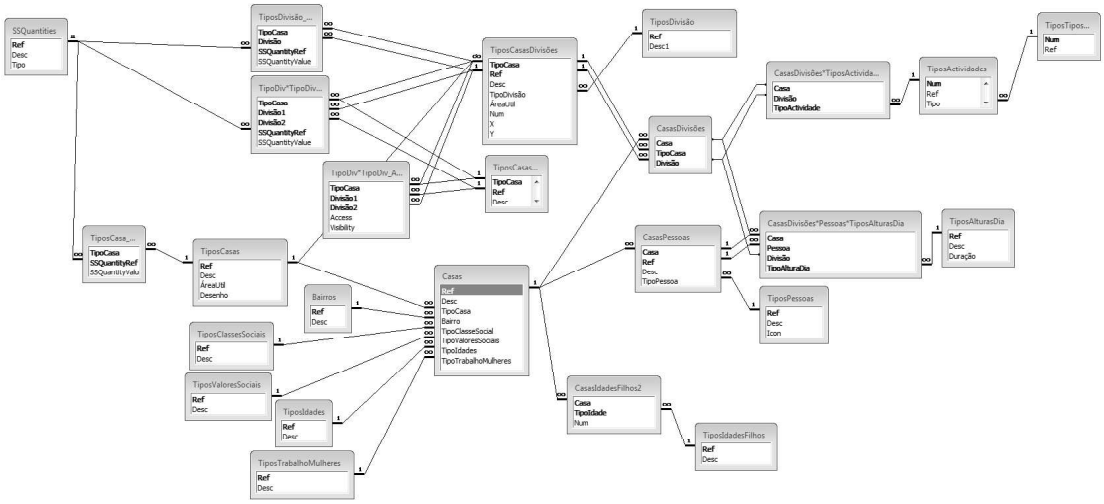



Figure 4.11.
Relational skill of the working database for the Survey on Urban Housing

As it has been seen, the work of the Survey was conducted throughout several years, predictably by several researchers, and, as such, there is some lack of consistency in the criteria of annotations in the documents. These inconsistencies were only corrected when mistakes were clear and, if some assumptions had to be made regarding, for example, the meaning of the "all" category during the process of analysis, data was digitised as closely as possible to the Survey. This should allow future researchers to make their own reading of the data and its process of development.

38 This work is being conducted with the invaluable support of Franklim Morais at LIA-ESAP.

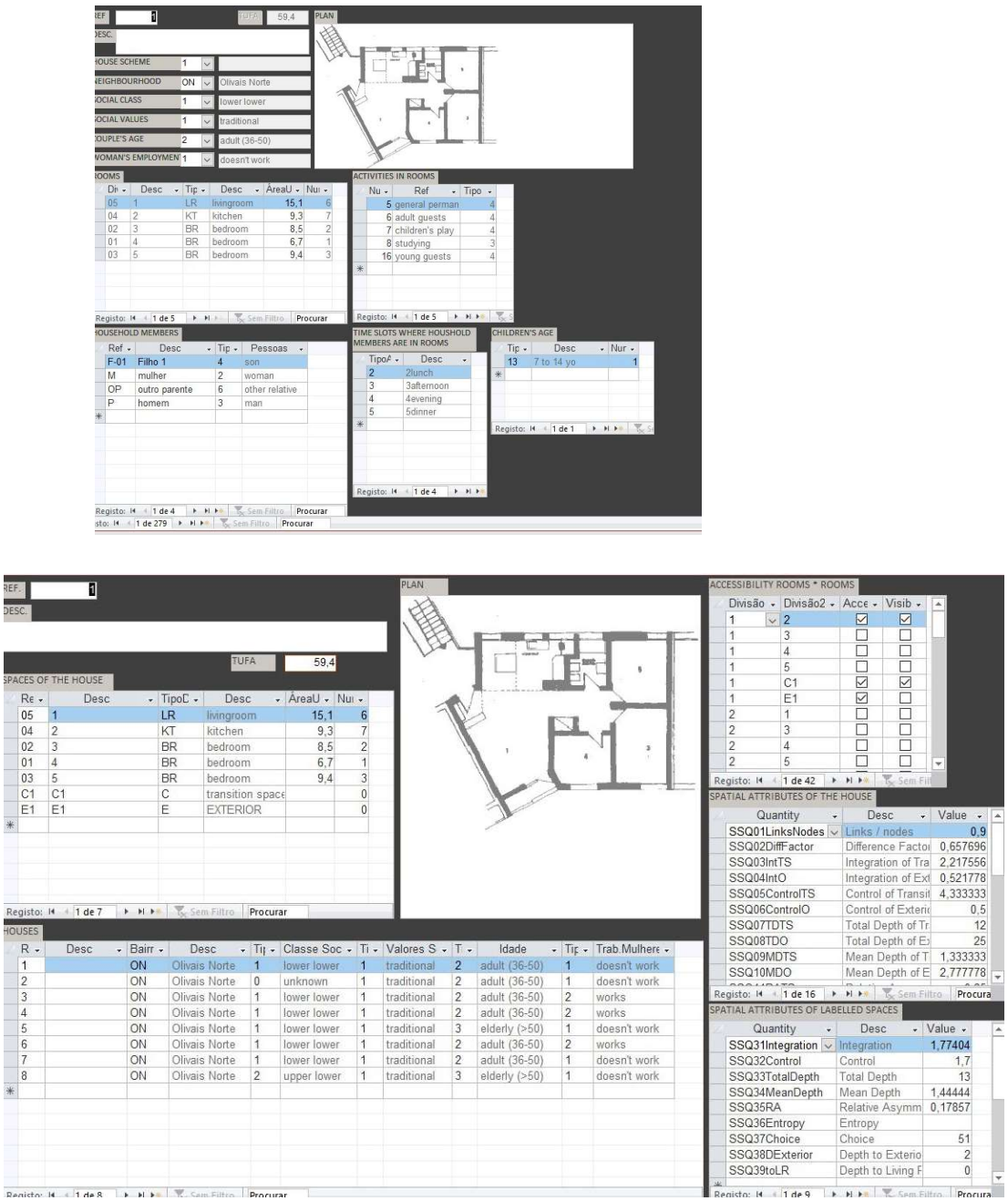



Figure 4.12.
Working form for consulting information regarding house-use for a household in Olivais Norte.