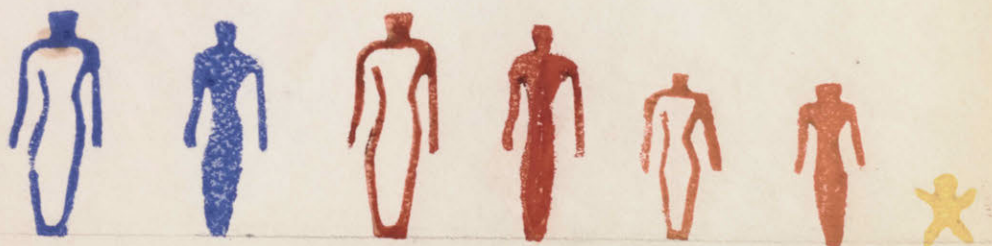


Netsch





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to professors anderson and beckwith

i wish to express my gratitude for their patience and  
attendance in my architectural education.

the characteristics of the house as determined by space-use and its application to storage, is in itself so wide a field that the problem here is confined to the solution of the factors presented in urban living and must intentionally ignore many structural, economic, and mechanical considerations, all of which are of equal importance but which require equal and eventual cooperative research.

the characteristics of the house as determined by space use

since the industrial revolution, science has produced within civilized communities technological advances that have changed the social, political, and economic standards of the people. much of this progress has developed more rapidly than the social and economic standards developed by the changes, and many of the standard necessities of life have attempted to use technological innovations by assimilation without considering the fact that the innovations were only developed through a complete analysis that led to progressive solutions.

the manner in which people live today is an obvious example of compromise with modern science, sociology, and economics. to solve a problem which must consider the desires and actions of people, an analysis must be made to determine the general conditions of living. these conditions develop permutations which in themselves establish individual character to living in a manner which expresses fundamental dignities and develops a method of living that heretofore has been a product of high income groups.

before considering any data, it is well to examine some of the influences which prevent direct conclusions. in the united states, ~~the~~ literacy and education have progressed through the enforcement of child-labor laws and compulsory education. the cumulative effect of such programs is often

defeated by two psychological factors. the first is the apparent unrest and conflict between the older and younger family members, and the disfavor developed through education of the younger for the vocations and activities of the parents. this dissatisfaction is heightened by the firm belief that apparel is of paramount necessity, making manual jobs undesirable and an impropportionate expenditure of income on clothing a requirement. while recognizing these difficulties, it is best to determine the origins for the development of unrest and surface panaceas, for these simple factors can be traced directly to patterns of living.

sociologists and city planners have proved that the overcrowded and unhealthful environment of a large proportion of citizens develops centers for crime, disease, delinquency, and moral and mental stagnation. psychologists have found that the factors involving moral and mental stagnation can be found in all income groups and that economic advancement, while so greatly desired by the individual, is not the most desired improvement for the individual or the community. where rehabilitation provided progress in ordinary community evils, more basic factors can be developed within the home to create new responsibilities of community life and a more wholesome progress through a pattern of living that can aid or stimulate actions (rest, relaxation, useful purpose) which are expressed today as fears or defeats or vicarious escapes. assuming and without

4

underestimating the value of community development, it is well to consider that such broad steps do not provide completely the total utilization of communal activity. the individual patterns of living must first be considered. while the importance of living patterns is of value to the community and for the attitude toward economic and social betterment, it is of greater importance to the family. the relationship of parents to children is basic. today through education, attitudes are more general or widespread in their acceptance, but the home enforces or destroys the cumulative good of society by its failure to assimilate or to promote both individuality and communal activity without jeopardizing one or the other.

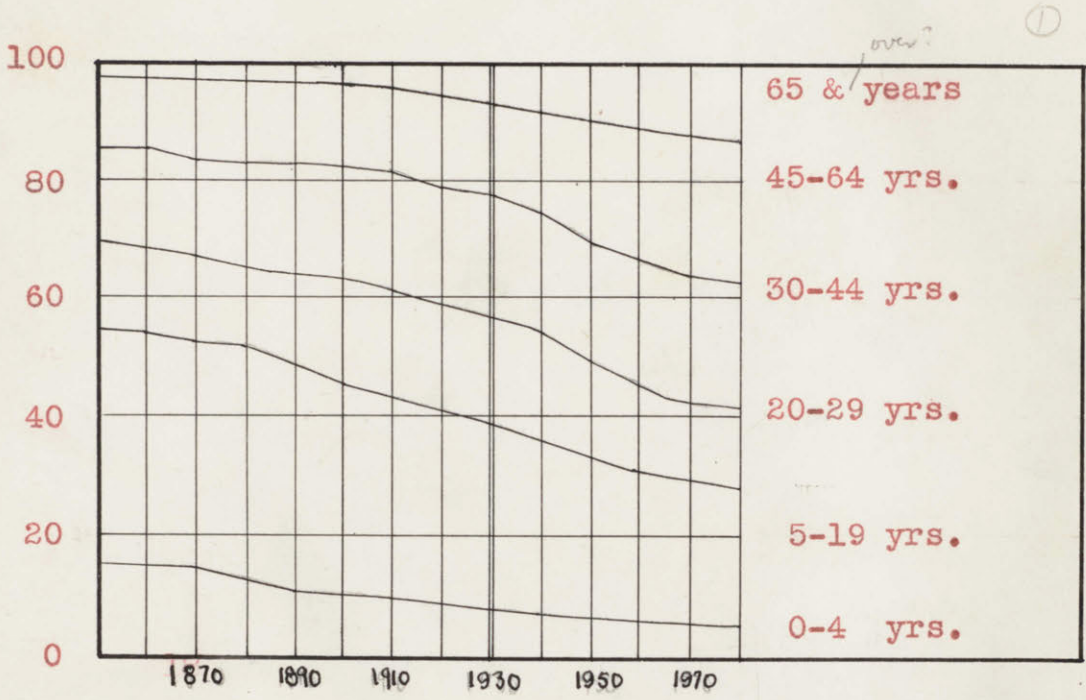
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as the determining factors in patterns of living are found, data will reveal the characteristics of the people for whom this problem is intended. because the problem of living is so generally recognized, research in the subject is prodigious, and no attempt is made at complete compilation, but rather a statement of factors involved is made to provide both a realistic and <sup>and</sup> rational approach.



while the population of the united states is slowly reaching a peak, it has assumed a character in age groups that require totally different homes from the sprawling country houses domesticated for the city and the large family of yesterday. new considerations are necessary for the difference in the present and future age groups.

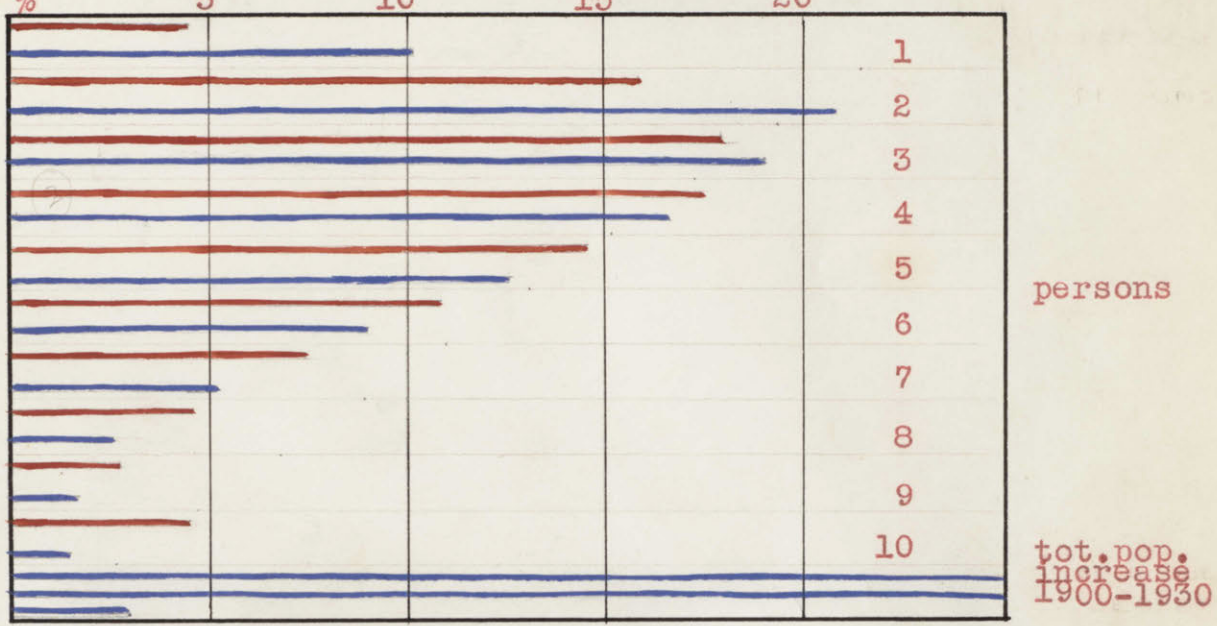
the percentage distribution of population in the united states



a complementary change is affected in the size of families, which is contrasted with the increasing population of urban areas, providing more families with similar problems, the logical one being the increased attention and planning of the parent around the child and the interdependence of the small group.



changes in family makeup 1900-1930 % of tot. pop. boston, mass.



although these family groups are smaller, the makeup of the family changes through the shift in longevity, the increase in divorce, and separation through death. (3)

type of family (chicago, ill.)	% of total
husband & wife only	~38
husband & wife & 1 child	~25
husband & wife & 2 children	~15
husband & wife & 3 children	~5
husband & wife & 4 or more c.	~2
husband only	~8
husband & 1 child	~2
husband & 2 or more children	~1
wife only	~8
wife & 1 child	~2
wife & 2 or more children	~1

194x

8

this has resulted in the first basic consideration in a pattern of living, and a determination of the urban family requirements. several important informative generalizations underestimate the psychological effects and numerical number of the paternal group and assume too abrupt a change to expensive maid service in a large proportion of the equalitarian group.

④  
the nonfamily areas tend ..... to be one-sex areas, i.e., predominantly male.

the areas of the emancipated families are the rooming-house areas, the kitchenette apartment areas, and the residential-hotel area ..... there are no children; relations with the neighborhood are casual or of the 'touch and go' sort; the interests of both husband and wife lie outside the house; both are employed for the most part .....

paternal family areas are those of the proletariat and the immigrant. here the husband is superior and superordinate in the home. the sizes of the families is large. the interests of the home are confined to the affairs of the home and the care of the children.

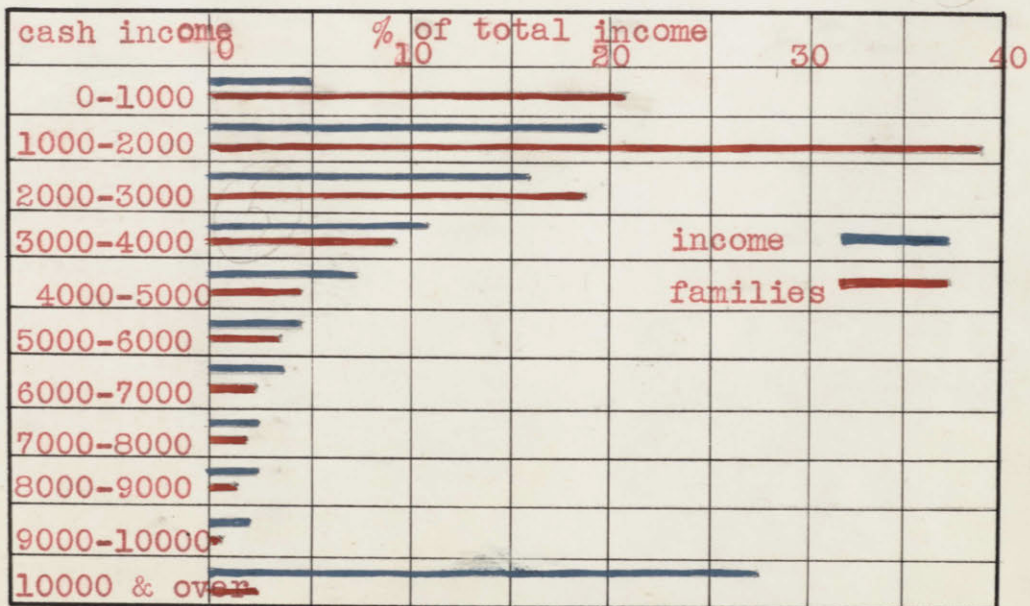
the equalitarian families' areas are those of the middle and professional classes. here there are children, though the families tend to be small. there is the minimum of superordination and subordination in the relationship be-

tween husband and wife in these areas. the wife has interests outside the home, delegating the care of the children largely to a nurse-maid.

the maternal family areas are those of the commuter. these are outlying districts characterized by single dwellings, typically bungalows, and by large yards ..... here the wife tends naturally to become the head of the family as far as the neighborhood is concerned.

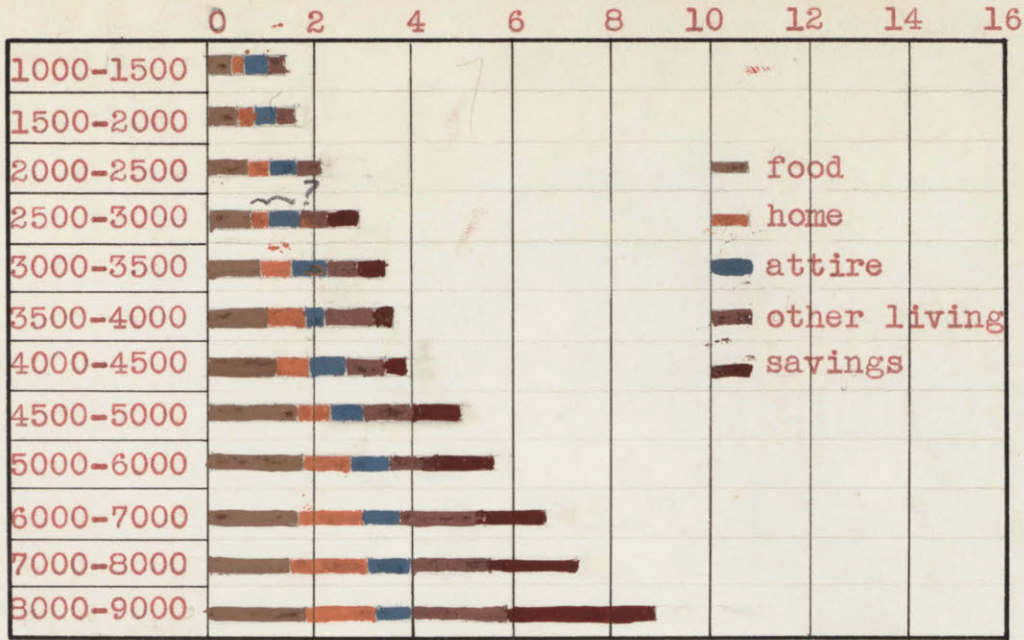
unfortunately the complementary shifts which provide opportunity in repetition of many general patterns show a striking converse in the lower income groups where the largest problem exists. since most economists believe that a minimum living budget exists between fifteen hundred and two thousand dollars, economies in some functions and desires of this group must be altered. it seems reasonable to assume that a progressively satisfying solution should be available at the suggested levels.

5





expenditures of families in thousands of dollars <sup>②</sup>



*Handwritten notes:*  
 1000-1500  
 1500-2000

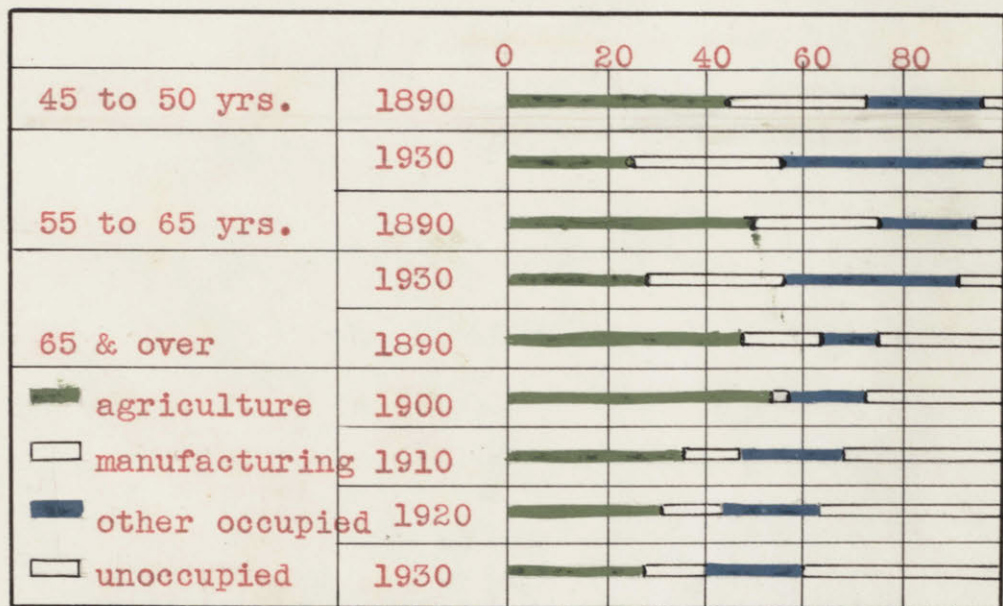
although most vocations are carried on outside the household, the independence of the wage earner and the necessity for providing his or her life at home with ease in pursuit of that job is essential, for the type of work motivates the whole family life, not only his working environment, his family background, friends, experience, income, and his interests, abilities, recreations, attitudes, prejudices, habits of thought, and outlook on life. occupations provide irregularities and confusion; in the lower income groups, education is forfeited earlier, and two or more workers are not uncommon. financial independence even when it contributes to household maintenance often replaces problems of adolescence with a demand for individual adult privacy.

occupations for the increasing proportion of older men are not readily available or demanded in industry, although psychological studies have determined that older men are adaptable to certain positions in lighter tasks where care and dependability are valuable. the abilities and potentialities of such a group cannot afford stigma or isolation and can today be an aid in many desirable home functions.

older men in occupations



(8)

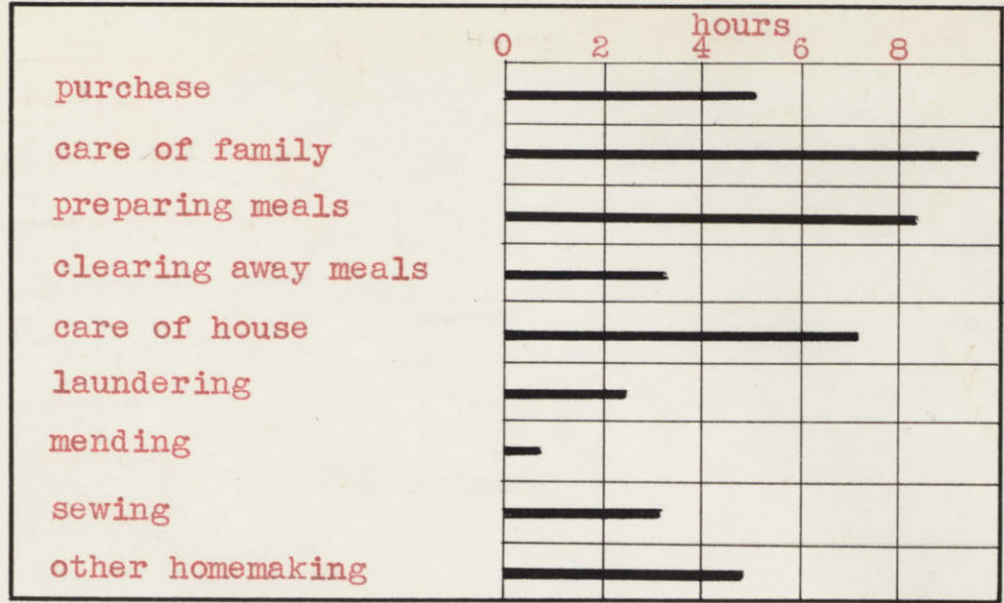


within the home routine work occupies a large proportion of the homemaker's time, and even when vigorously planned become utilitarian functions which can prevent or prohibit other social or home activities.

for older men?

hours of household work

9

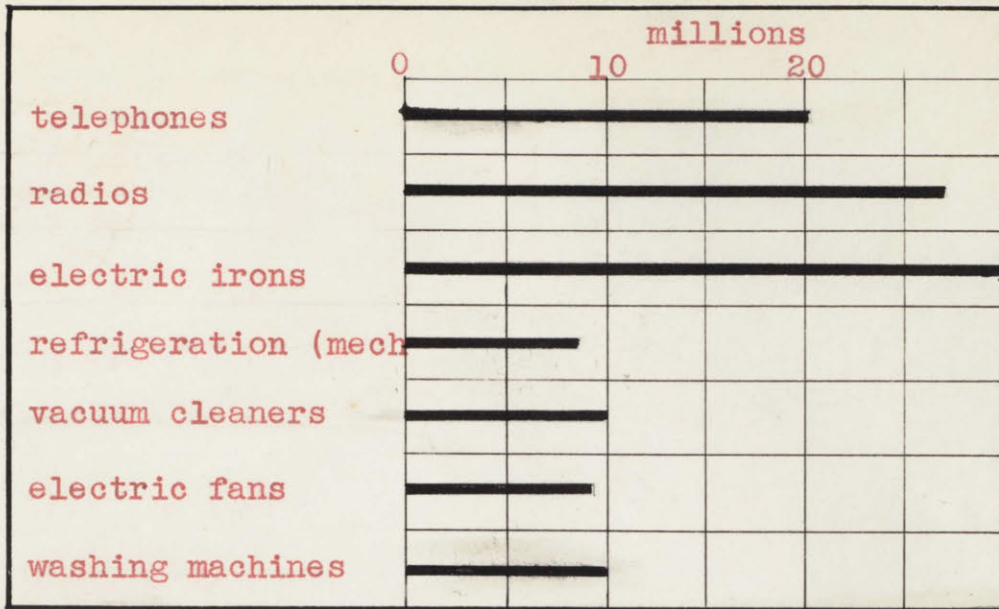


?

industry has created many products for the home but these vary in availability. unfortunately, the cheaper products have sold in tremendous quantities, providing an interesting phenomena, for most women in reply to questionnaires ask for more of this equipment in the firm belief that they will be freed of all household difficulties in this way. this subjective approach to conditions within the home without considering the work area, use factors, leads to economic waste and unconscious disruption in the search for surface cure-alls.



mechanical household devices sold 1900-1935

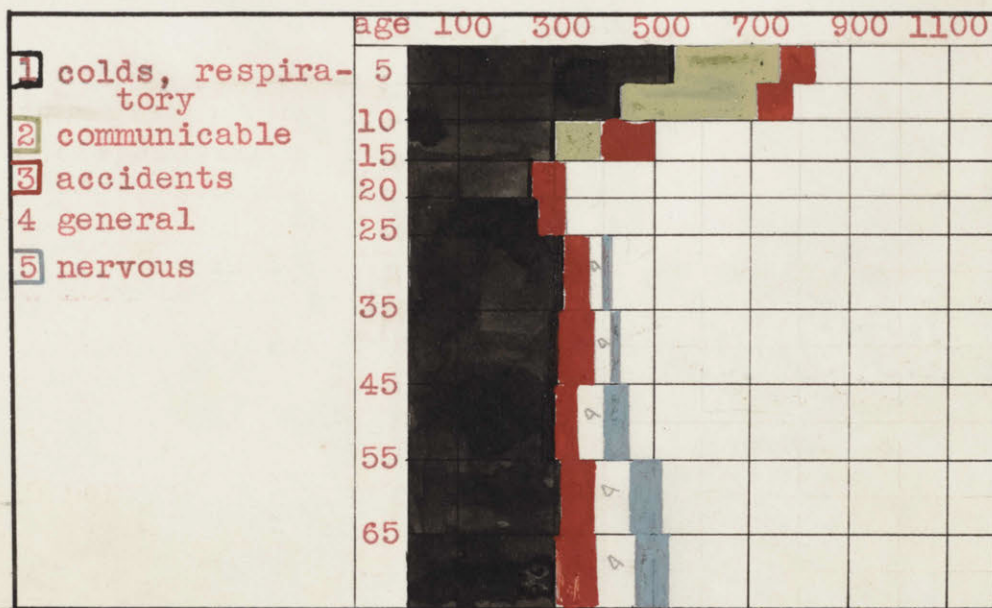


two very logical problems have been considered by many economists and sociologists as typical examples of productive and personal extravagance<sup>a</sup>. in urban localities commercial laundry work is readily available and the initial cost of laundry equipment and the required areas can be saved by their use. the time and energy saved on the part of the housekeeper is a function too little considered. where certain<sup>n</sup> commercial practices are not desired, compromises in the degree of outside service render solutions in which the equipment and space required is still less, and the equipment can serve several uses. commercial service for infant clothes is thoroughly practicable. in no solution can the washing problem be eliminated. again considering the cost of equipment and time home sewing presents a problem more adaptable to individual solution. many simple

garments and children's clothes can be made at home with better material and designs, but such clothes are economical when an actual proficiency exists. the psychological necessity for a great quantity and variety of clothes often leads to an overexpenditure of funds. therefore household activities which were once considered an essential in the past must be rationalized and contrasted with the advantages of the new activities to determine not only the value to the individual but to the family.

as vocational habits determine a family pattern of living, invalidism and ill health upset the regular patterns and temporarily impair routine. special care and isolation have a marked effect on efficiency. contagious diseases in children and infirmities in the aged and frequent colds provide the major problems which necessitate adaptability in space-use considerations.

illness rate by age groups requiring average home care / 1000

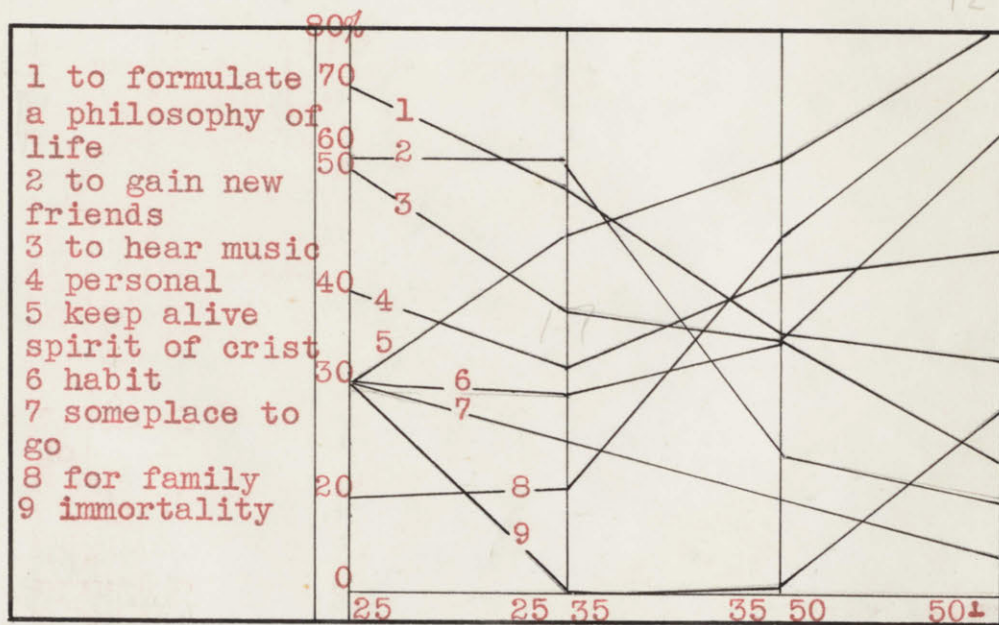


all considerations cannot be measured in material influences for personal activity and thought are even slower in assuming equilibrium with a changing society. modern conveniences have placed national and international thought within reach where formerly the thoughts and outlook of the individuals were dominated by local, even domestic knowledge and surroundings. the effects of a widening influence are as yet too recent to affect startling changes in correlations of attitude, and unfortunately place general appreciation behind all other personal consideration and demands more concerted effort in education.

good housing is of importance not only because the activities of the home can be greatly simplified, but also because family relationships are not subjected to such a severe strain where there is the opportunity for privacy and for following one's interest without interruption. the recognition of family relationships as the cause of strain can be quite accurately corroborated in statistical data. while many of the grievances are emotional or personal, the relationship of the difficulties to a proper space use organization is consistently obvious. it is unfortunate that in many situations some of the aims in family life are only considered. although human endowments vary, reasonable supplementing factors can provide easier facilities for the simplest requirements.

however, psychological data is not all depressing for of the many habits that have persisted in the organization of family life, religion and church have formulated ideals and hopes outside the smaller domestic group, and provide reactions that are based upon long association. the fundamental value lies in the idealistic aims rather than material or personal escape, and many social functions which were ordinarily church groups are no longer suitable or economically feasible under such guidance.

motives and values in church attendance



where full educational training has been provided adaptability to changes and freedom from restrictions has developed the most drastic differences. these facts substantiate the value of education, but do not eliminate the obligation of satisfying all groups. in fact a philosophy rigidly adhered to would provide first for the older group and allow

gradual assimilation of the younger ideas, which, accordingly have more flexibility. unfortunately, this is not psychologically possible because personal changes are varyingly slow or abrupt and add time factors confusing and innumerable in connotation.

a very logical interpretation of emotional crises within the home can be determined in the complaints for the repeating difficulties coupled with the stability of the home as both an architectural element and <sup>in</sup> the long hours <sup>of</sup> required <sup>home</sup> living. whether or not the husband may in his home find refuge and refreshment from the storm of vocational competition, the children there find calming good sense for meeting their childhood difficulties, depends more on the adjustment and emotional life of the mother and wife than upon any other factor.

the daily activities of the household, such as child care, preparation of meals, and general care of the house, cause worry, friction and fatigue. worry can be caused by the inconvenience or danger of all interior equipment. home accidents reveal safety as a prerequisite in space-use considerations. even where safety is not a factor, the inconvenience of activity, dressing, cleaning and food preparation develops fatigue. fatigue can be solved by eliminating the cause, as in washing clothes, or by providing more efficient methods. efficiency itself is determined by intellectual capacity and health. complaints of will and volition are unacceptable, for they can be overcome by environment, incentives, and working conditions.

the house must not only provide a refuge from frictional human contacts, but it must cede to the variety of private requirements. such considerations change with the intellectual pursuits of any individual, but must provide many variations heretofore not considered.

privacy preferences in order of importance



father

- rest
- study
- work
- reading
- quiet
- being alone
- music
- writing
- thinking
- art expression
- entertaining without children
- talking
- comfort

mother



- reading
- resting
- study
- quiet
- writing
- being alone
- work
- sleeping
- typing
- dressing
- bathing

as the adult grows older, considerations become more simple but more exacting for discomforts develop emotional reactions alien to communal existence which is essential for continued active participation in life and which is usually the only alternative for most older individuals.

housing can be a very great help, or an equally important source of more work and worry to the housekeeper. the chief difficulty is that the house does not grow up with the family. the whole house seems to center about providing an environment for the family, especially children. since most families

concentrate on this function, the child provides a pivot point of family interest. the simple and early random actions of the child furnish the beginnings of a child life wholly separate. parental duties vary from care in the earliest to stages , to active participation in, and then with the child as it grows.

early child habits ?



(17)

years	0	1	2	3	4
crawl	[red bar]				
creep	[red bar]				
walk	[red bar]				
up & dn. stairs	[red bar]				
jump, skip	[red bar]				
hop, dance	[red bar]				

during this period, the child masters in general the physiological possibilities of his body and has now passed the stage of pure visual and audible enjoyment. <sup>he?</sup> it now is more able to carry on his duties more in relation to the family and to companions.

however, child entertainment has a more positive reaction than pure enjoyment, for every activity requires responses

that become automatic through repetition or imitation. the social value of relating such activities to all action and thought provides habits that, early established, can serve prominently toward a well developed character. at present, this education is primarily sponsored by the school, which is unable to penetrate or overcome environmental factors.

it is obvious that education and parental participation in child education determine much of the childhood environment. improper attention or unsatisfactory design provisions offer opportunities for emotional conflict with the parents and emotional conflicts among children when home life and surroundings provide opportunities for social maladjustments as inferiority, lack of pride, interest, and incentive. communal and private activities are recognized by the children and are valuable in developing responsibility and interest in family life.

privacy preference in order of importance

child



- study
- play
- being alone
- sleeping
- friends
- work
- reading
- learn to play alone
- rest
- painting
- quiet
- music
- freedom
- handwork
- being away from adults
- keeping personal belongings



companionship among children by age groups

19

	10	30	50	70	90
under six					
frequent	[Green bar from 10 to 70]				
seldom	[Red bar from 10 to 30]				
six-twelve					
frequent	[Green bar from 10 to 85]				
seldom	[Red bar from 10 to 25]				
13-18 years					
frequent	[Green bar from 10 to 70]				
seldom	[Red bar from 10 to 40]				

with the change in the child world, new opportunities in play habits are evident. the neighborhood provided an enlarged sphere of activity and choice for entertainment.

20

recreational choices of children

children



- sports and games (large space)
- sports and games ?
- construction
- vehicular toys
- other toys
- dramatic play
- apparatus
- reading and special interests
- pets
- miscellaneous

recreational choices in child growth

boys	years	girls
playing with a ball playing with blocks playing with a wagon playing house playing horse hide-and-peek playing tag drawing playing school playing in a sand pile	5	playing house playing with dolls playing with a ball playing school drawing mulberry bush playing with blocks skipping making things jumping rope
football baseball boxing just playing catch riding a bicycle basketball wrestling playing cowboy roller skating marbles	10	playing the piano going to the movies looking at "funny" paper playing with dolls roller skating riding in an automobile reading books playing school jacks listening to the victrola
basketball football baseball driving an automobile tennis watching athletic sports hunting going to the movies boxing reading books	15	reading books going to the movies social dancing playing the piano riding in an automobile having dates watching athletic sports going to parties, picnics basketball doing gymnasium work

but the changes with age determine more complicated and numerous and complicated activities with mental growth until they are dominated by the social and physiological changes of adolescence.

education within the home and at school must be coordinated for each in turn can complement the other. it is too seldom recognized that education can be play and play education, for the growth of education has increased so that one fourth of the total population is in full time school. the number of high school students has increased six times and colleges student enrollment three times. as the period spent in school covers one third of the total life span and concerns the most formative years, a progressive environment is essential to satisfy these serious and rapidly changing conditions.

*is what period?*

the value of education is also recognized among adults for organized adult education has increased twofold, providing the most promising environmental improvement. the enlarging of adult interest coincides with greatly increased recreational activities. both are traceable to the widening influences of modern science. as in the interpretation of likes and dislikes, prejudices and bans on sports changed rapidly after the first world war to permit open activities for both sexes. opportunity for recreation was intensified by shorter hours and more freedom among all occupational groups. some outdoor sports are old and stem from nationalistic cultures as italian bocci, while some have changed formerly essential occupations into sports as fishing and hunting. sports that formerly belonged to the gentry are now popular games for all ages. the need for proper facilities increased public expen-

diture six times from 1920-1930.

it is numerically impossible to determine the number of spontaneous group activities on the public baseball diamonds and the sandlots, especially since such activities now are sponsored by industry and industrial recreational programs. these sports have developed a competitive spirit which inspires a proficiency factor unattainable by all. in children, this factor leads to psychological disturbances and the more generally mentioned advantages of sports as teamwork, cooperation, and fair play go totally unrecognized in the most needed cases. the desire for less competitive activities increases with the gradual decline of physical abilities.

(22)

..... a more basic motive, that of the optimum development of each individual member of the family. optimum development can only be attained in a family through a correct provision for private and communal life. communal life is the least understood family relationship. active sports are not able with the exception of swimming, to promote family communal activity. now actual participation is not essential for professionalism has promoted spectator interest. this is passive activity and like the moving pictures, theater, and concert hall, present a leisure time activity that is founded on assimilation through entertainment not participation. while of itself this interest is not dangerous, it has two psychological disadvantages, by providing attractions that require a small

amount of individual initiative and by providing in the under-developed escapes from actuality and satisfaction through vicarious experience. recreational activities should become less competitive but more constructive. comparatively few people consider the value of free time.

with the increased education and the increased free time facilities for relaxation within the home are essential. this is apparent with increased age and freedom of <sup>from?</sup> responsibilities.

however there is no valid reason why hobbies should not be carried from childhood through adulthood. the most serious difficulty is the lack of proper facilities. psychologically the communal interest in a family can be satisfied or the rest and relaxation of the individuals can be satisfied, especially on the part of the wage earner, with an incentive for home hobbies. in fact many seasonal workers do maintain hobbies that are positive factors in an ordinarily irregular household.

hobbies need not necessarily be special work or research. the value of such activities can be personal or communal, but their proper coordination in space-use considerations can promote family relationships that foster vital qualities in home life.

23

the ideal home is unhampered by the traditions of the past.  
the utilization of all resources of modern science to improve the home life.

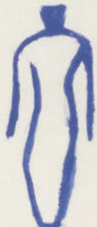









the freedom of the home from the dominance of things and their due subordination to ideals.

the simplicity in material surroundings which will most free the spirit for the more important and permanent interests of the home and society.

?

preliminary analysis of space-time use and time-space  
use as effecting patterns of living

color key for individuals

age group	type	male	female
55 and over	aged		
21-55	adult		
12-17	adolescent		
5-12	child		
1-5	baby		



color key for activities

sleeping



quiet study



washing



relaxation



bathing



personal privacy



dressing



play



food preparation



communal activity



eating



housework



entertainment



guests



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mr. cyril m. harris, of the staff of the massachusetts institute of technology

the results of the psychological and physiological factors in space-use patterns of living reveal the incongruity of the average space relationships. passive activities as sleeping and relaxation take a large proportion of time use, but require little space in proportion to the intensity of use for active areas. the active areas require the optimum use for a comparatively short time in the average day. however, these activities extend on free days or for entertainment and justify a larger proportion of space-time use than passive activities. the recreational activities vary by age and choice so that a variable articulation of this area is essential. the correct use of communal and private areas would eliminate friction within the home and increase its effectiveness through proper use. consideration must be given to ease of household operation in any flexible activity. noisy or dirty hobbies require segregation but do not require articulation for the value in time use is variable not only by the hobby itself, but by the interest in it. as the family grows, the activities concentrate and any development of space use must allow for the shift from articulated areas to one integral unit.

eating was formerly the center of communal activity, but the effectiveness is offset by the possibility in developed recreational activities where the space and time considerations have a more logical opportunity for action or recreation. food preparation and cleaning upsets the opportunity of con-

tinued relaxation of at least one member of the family. this fact and the necessary efficiency to make meals pleasant in the average home, requires less articulation of the dining area. it should be adaptable for both more formal entertaining and for use during the day.

bathing and dressing habits change by age and sex. only in a home of adults where all are working in business or industry will serious overlapping of bathing facilities exist. there is no reason for individual bathing facilities for the average home. washing presents another problem for concentration of time use, although in itself very short, and reasonable privacy when dressing make repetition desirable. washing from hobby or from outside play are simplified when there is more than one sink. washing clothes that do not go to an outside laundry requires space other than the kitchen.

the kitchen requires most of all efficiency and this can be attained where the main use functions in cooking are separated, especially in washing, hot and cold foods, and delivery. the possibility of new methods of packaging, now already realized in frozen foods and dehydration, may change the storage requirements, but do not change the methods of food preparation.

<sup>e</sup>maintainence of the home must be simplified by arranging use-areas of dirty or messy character in definite locations so

that materials can be chosen for upkeep. when such functions occur in one area, the order and ease are simplified. areas of passive activity require the minimum maintenance when they are reserved for only that purpose. space-use then can not only segregate or develop order in patterns of living, but can at the same time reduce home management.

activities, whether active or passive, require storage. storage units can determine areas and use. to maintain the flexibility of individual and group requirements, to increase efficiency in space and use, and to limit obsolescence of the units themselves, are the impressive factors that storage can develop. flexibility can be divided in four categories.

1. flexibility within one unit area for a change in storage requirement.
2. flexibility of access to permit entrance on both or one side or alternately.
3. flexibility through the growth of a child or increase or decrease in storage requirements.
4. flexibility in the entire unit for major changes in space-use requirements.

units must be available for furniture that is used occasionally or for artistic display of hobbies, collections, or decorative pieces.

to attain these factors, storage units become flexible walls. however, all interior walls are not required for storage pur-

poses, but may interfere with the change of space use requirements. therefore, these must also be movable for ideal considerations. application of this design factor is probably possible. the main problem confronting any flexibility (aside from the design for flexibility itself) is acoustics. passive and active patterns establish thresholds of sound that can interfere with the efficient use.

all storage units need not be flexible, for certain activities develop patterns which do not change, and these may serve structural uses. growth of children has the effect of molding and expanding space considerations.

space use:

specialized equipment for the house is used at concentrated times and must be planned

for compact use

for easy accessibility

because upkeep is the longest time user, the space use should be economical as possible.

permanent units should occupy floor areas to make <sup>the</sup> actual floor areas to clean smaller ?

permanent units should be hung or cantilevered to make cleaning easier < ?

all dirt making traffic within the house, should be relegated to specific easy to clean areas .

no specific use of an area can be rigidly adhered to because personal habits change.

hobbies carefully prepared for are changed or dropped

sleeping is not an easy habit for all individuals ?

illness and entertainment cause upsets which ~~are~~ must be considered but must not organize the plan (special exceptions)


growth of children cause upsets in space use


much storage is necessary to keep all equipment and if kept organized, can reduce the size of other units


child play areas, hobby areas, dining areas, and

*et pass?*

time-space-storage relationships within the house

 clothes storage

 activity equipment

 special equipment

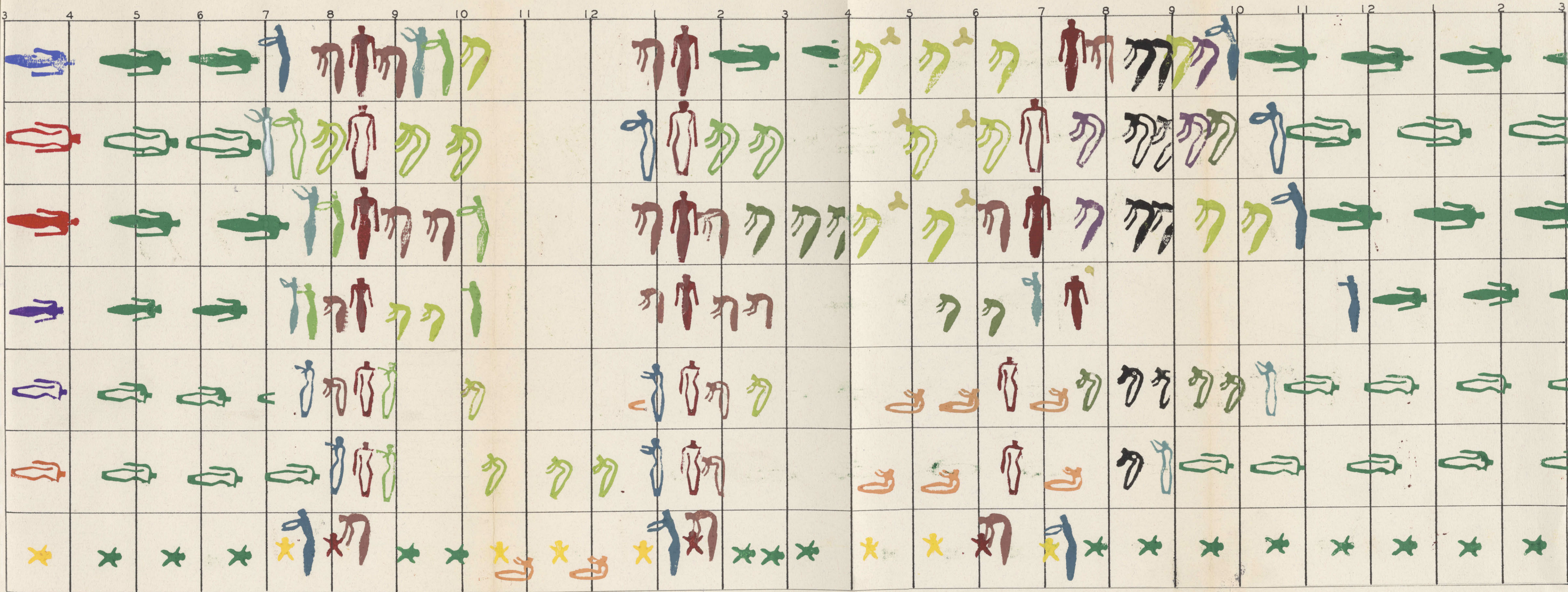


pattern of living — space-time use



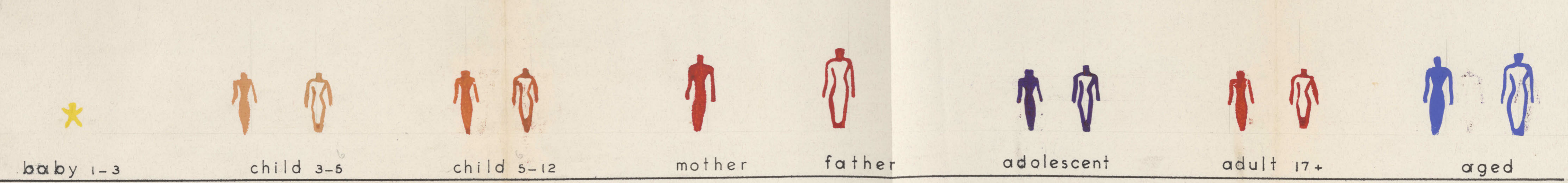
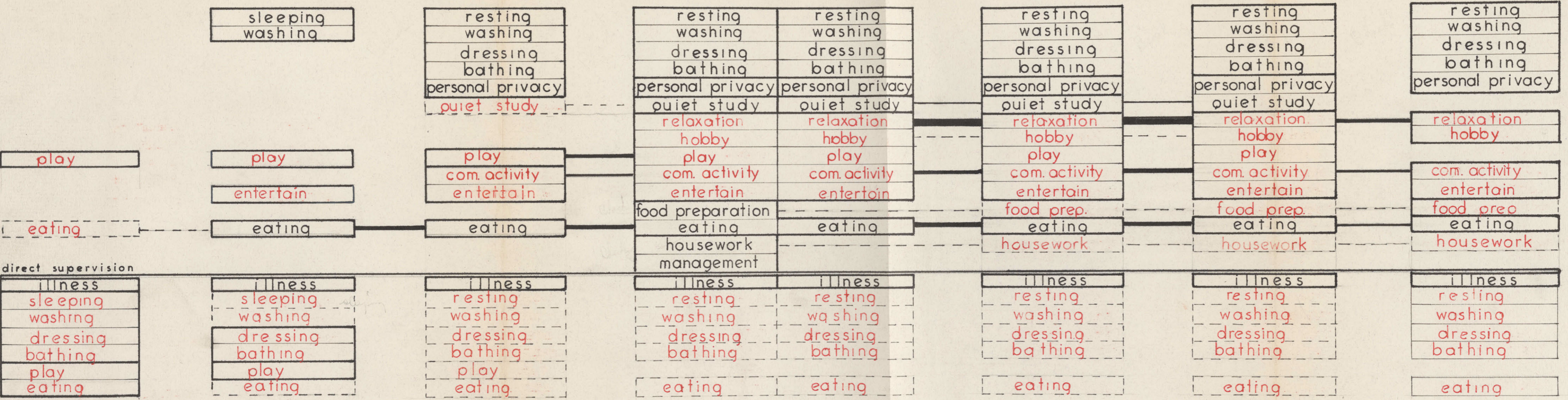
average work day

pattern of living — space-time use



average free day

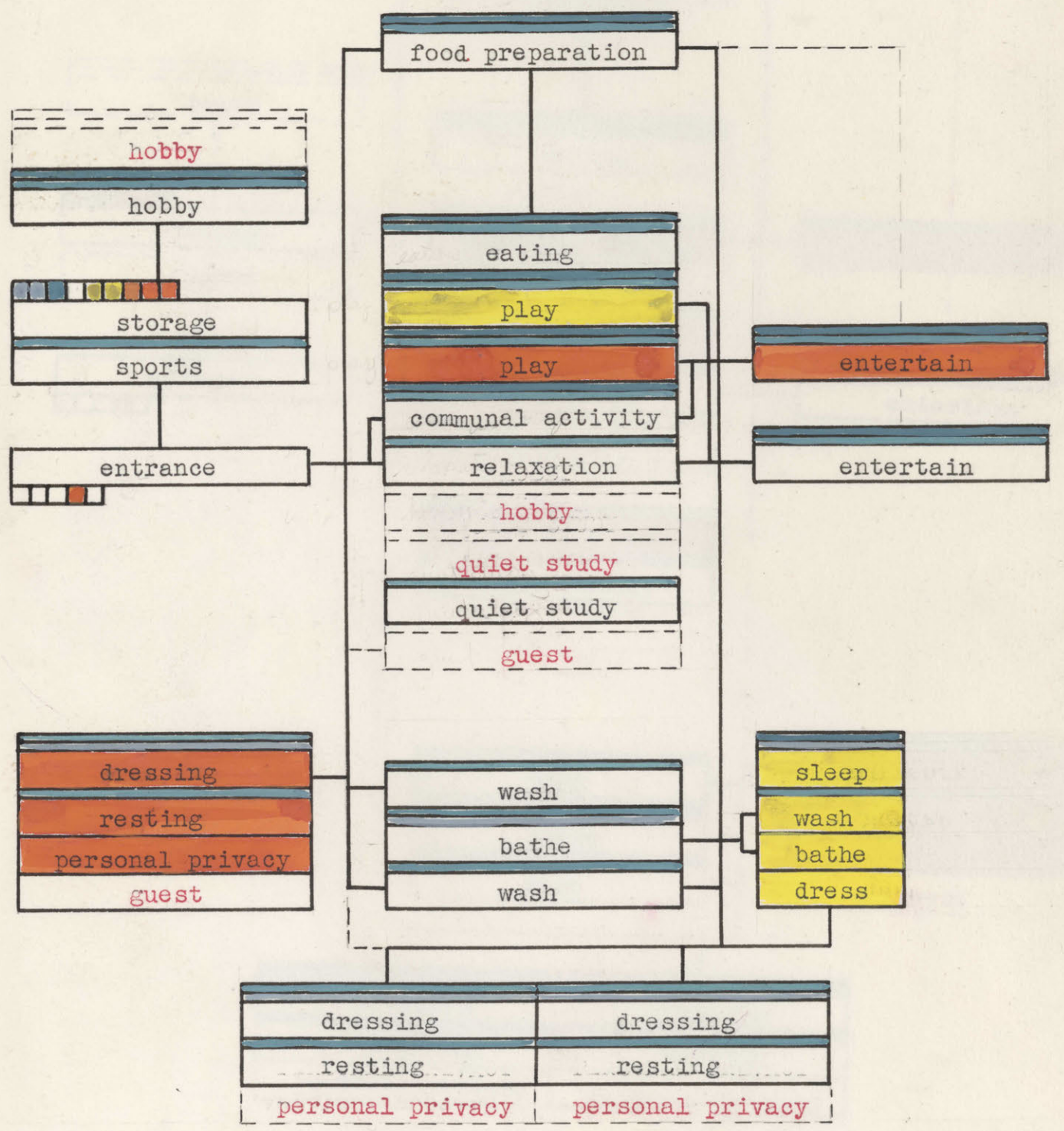
pattern of living — time-space use



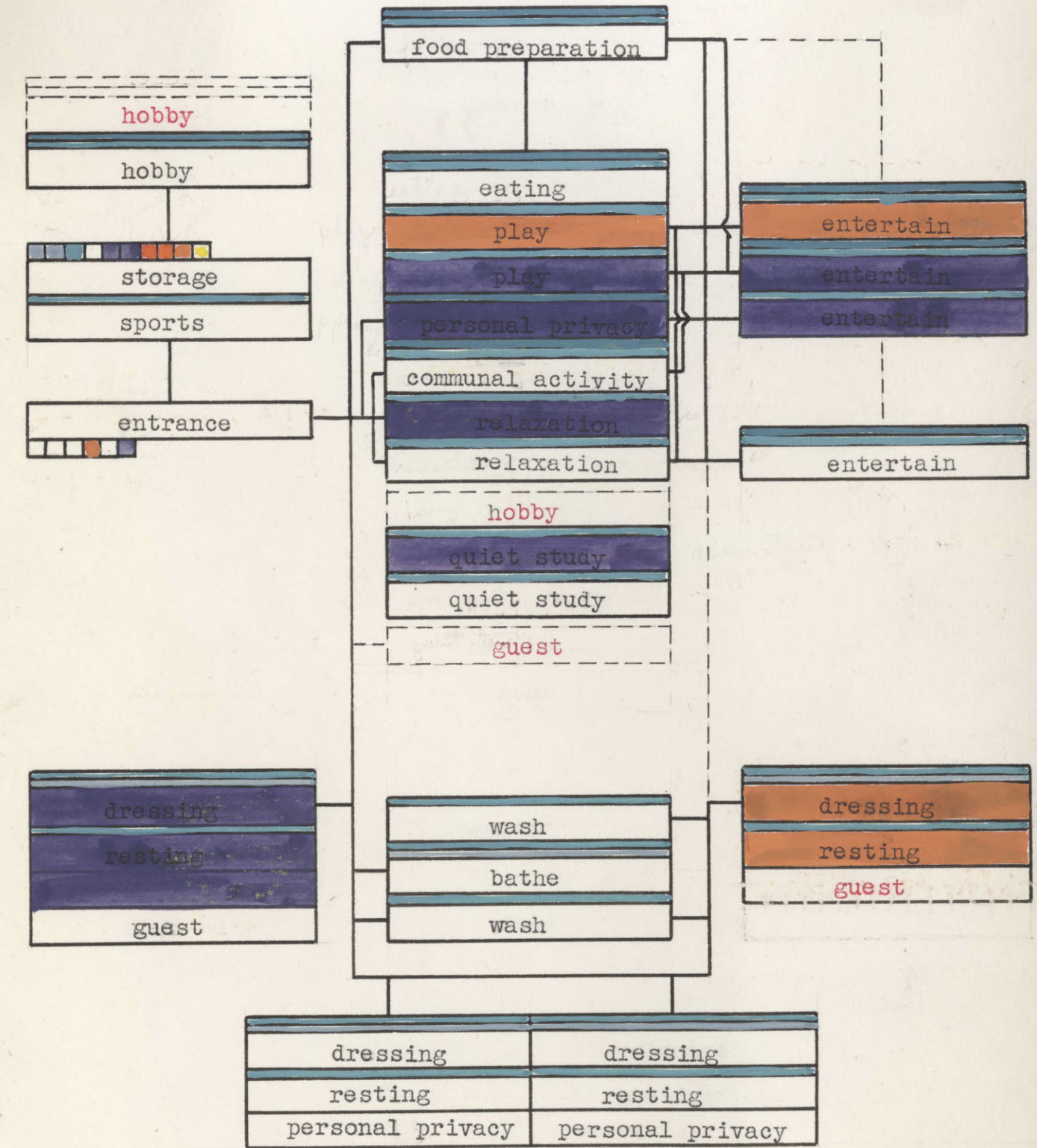
affect of the growth of a child  
relation of parents to children

patterns of living

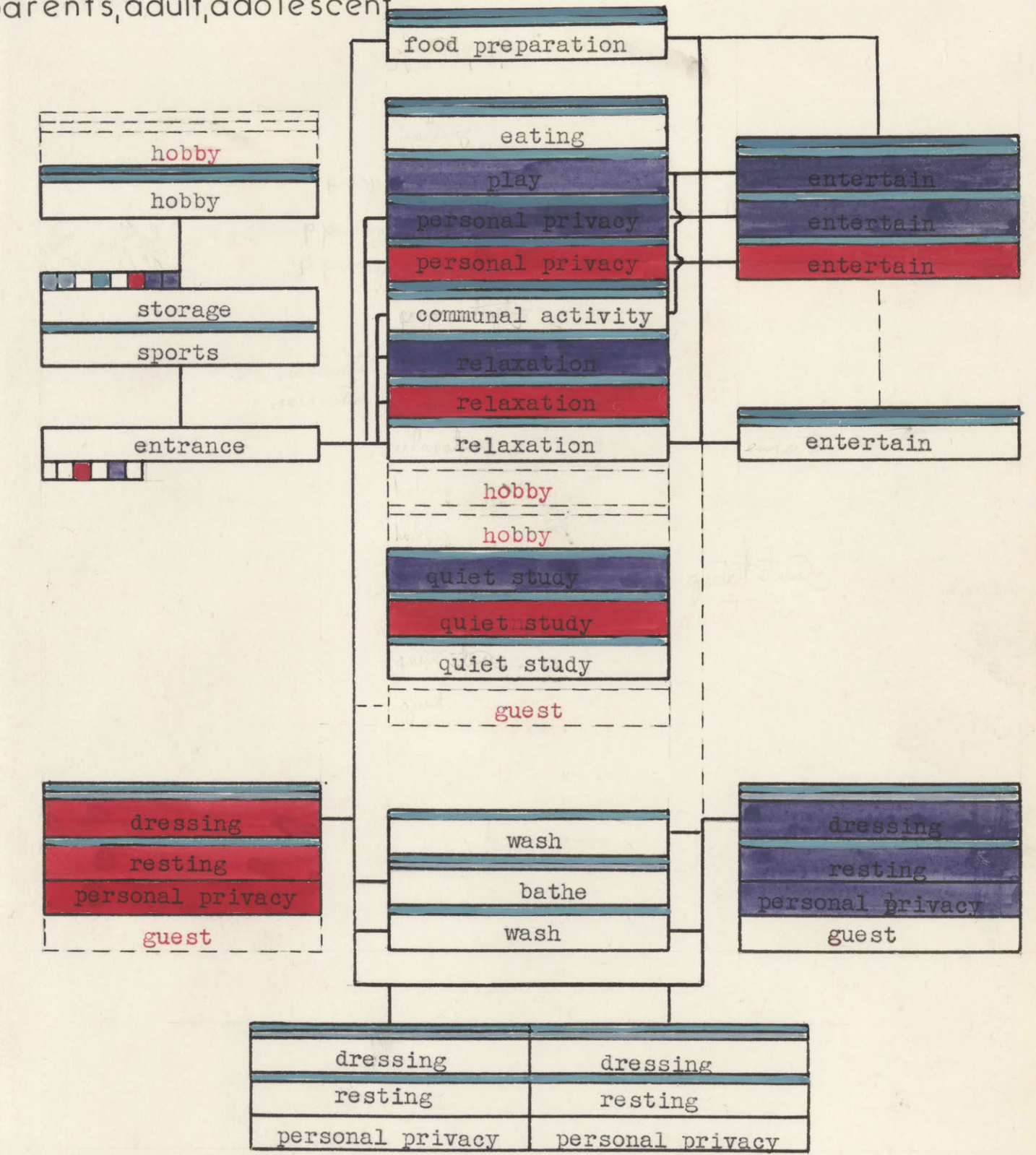
parents, child, 6-12, child, 0-3



parents, child, 3-6, adolescent

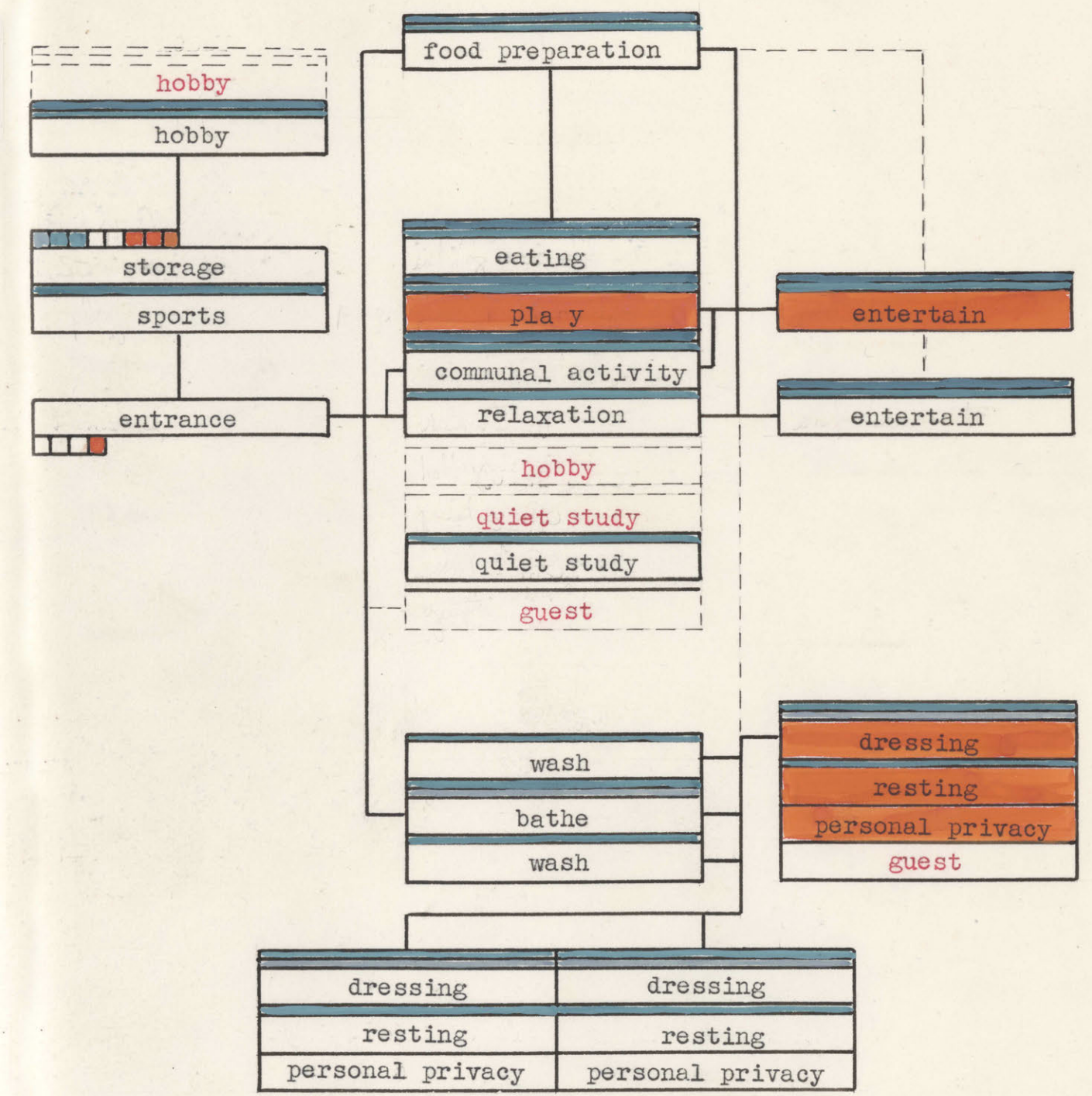


parents, adult, adolescent

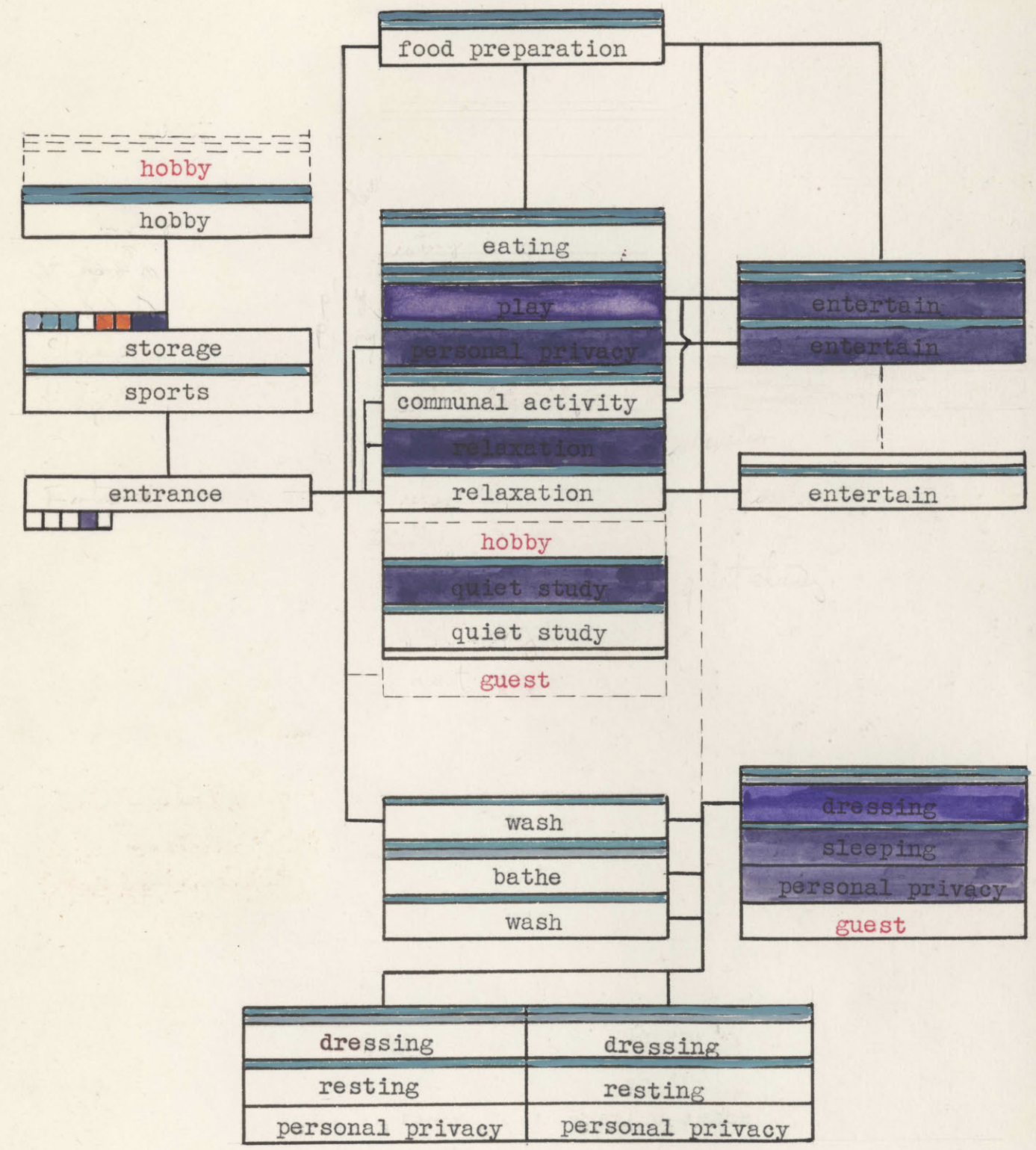


patterns of living

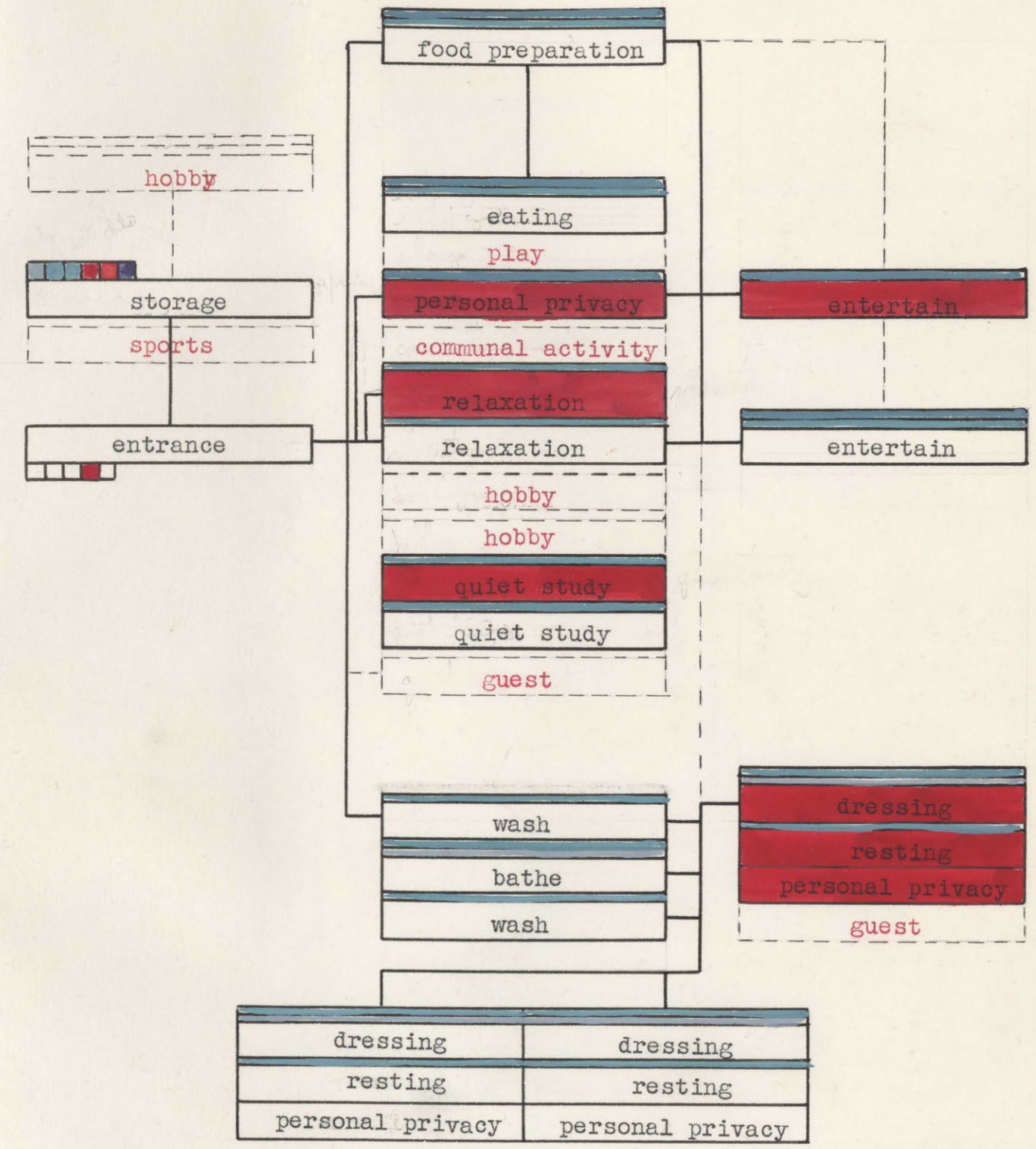
parents, child, 6-12



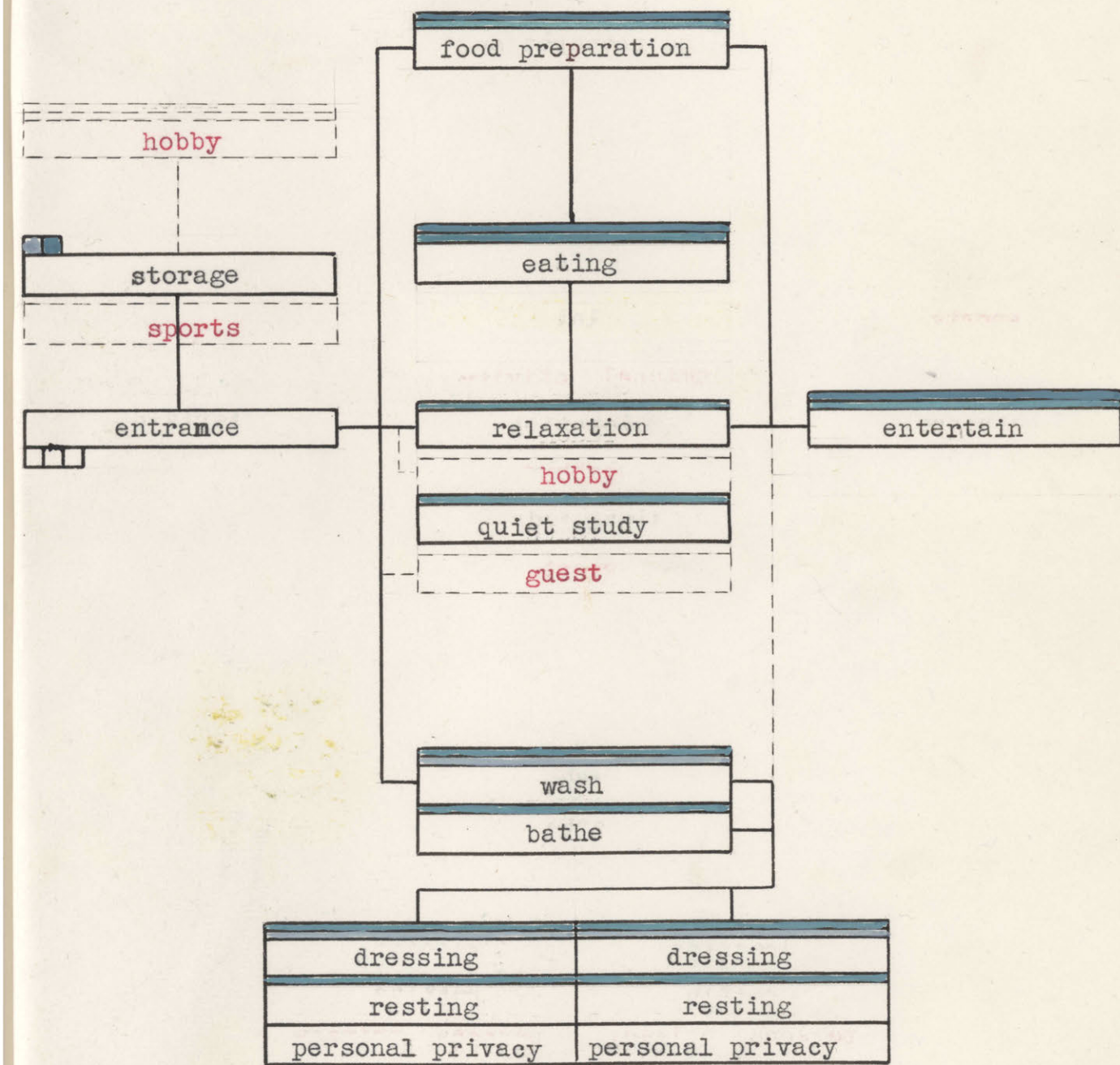
parents, adolescent



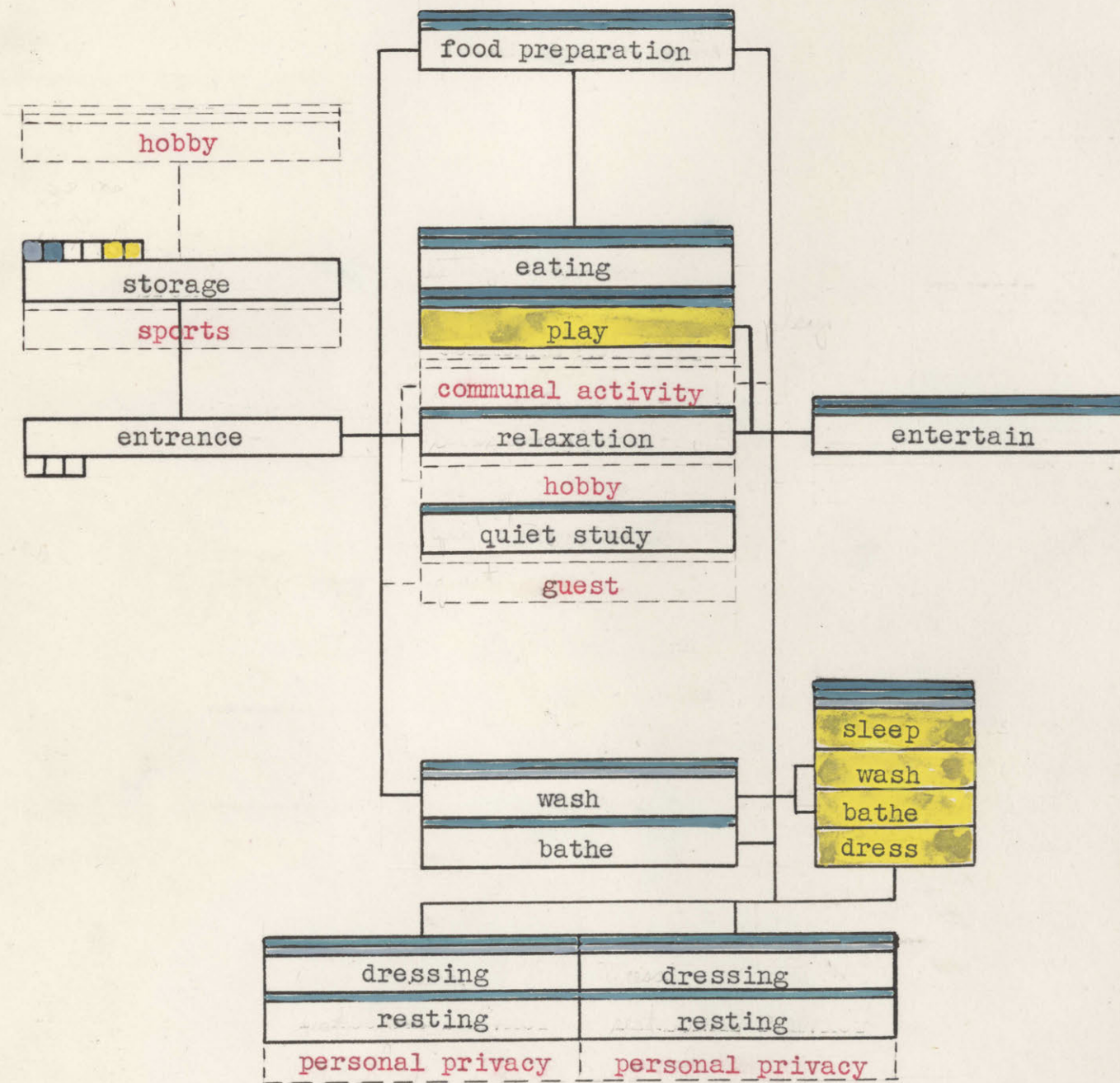
parents, adult



patterns of living  
ents



parents, child, 0-3



parents, child, 3-6

