

Human Evolutionary Aspects and Urban Dwelling Features

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ABSTRACT

Planning and architecture of modern housing projects should take into account the fact that human well-being depends very much on needs derived from the natural history of human evolutionary aspects, which include territoriality, security, and a balance between privacy and communal activity. Although model housing projects should consider space, all too often the need for privacy and the importance of the residential environment has been neglected. Putative consequences are a loss of social coherence, resulting in anonymity, vandalism and an increase in crime rates. On a game theoretical basis, we predict that a tendency for cooperation grows with the increasing probability of future meetings among inhabitants. The higher the probability to re-meet co-residents, the more interactions are to be expected. Frequent meetings lead to reciprocal recognition and enable the inhabitants to control their environment by identifying strangers. This mechanism results in the identification with a common territory. Friendly interactions between residents are a motor for and an indicator of satisfactory living conditions. For this study, six different Viennese residential apartment blocks were selected and their quality measured using a checklist. The behavior of the residents was recorded using ethological standard methods (N = 1653), their subjective evaluation was assessed by on-site interviews (N = 300), and the frequency of physical incivilities was counted. The results support the hypotheses. The classification of urban environments relating to the presence of the above-listed features indicates that high habitat quality covaries with differences in preference for the site, extent of friendly interactions and familiarity with other residents, and occurrences of incivilities. One may conclude that the importance of the quality of the habitat environment cannot be overestimated, as its socially integrative potential is a means to counteract anonymity and crime incidence in cities.

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Introduction

The human habitat

In contrast to the majority of animals, *Homo sapiens* does not have a genetically fixed program for constructing his home. Housing type differs within and between cultures and changes by interaction with ecological and social factors. Looking at this more closely, Irenäus Eibl-Eibesfeldt detects three basic purposes¹:

- shelter from the weather and other environmental influences
- a private place where entry is not possible without permission
- a common place where social contact is available

“The basic idea is that homes reflect the dialectic interplay of individuality and society, such that there are forces for people to be linked with, and influenced by a larger community and, at the same time, to be separate from and independent of societal influences”². In this view, our species’ housing represents an averaging mixture of these two parts³.

In modern urban living space an appropriate balance seems to have been disturbed. The requirement for shelter and for privacy are well satisfied, nevertheless a lack of social coherence leads to enormous problems in urban housing projects. These, designed under an assumption that dwelling takes place inside the house, will inevitably fail, whereby vandalism, incivilities and crime arise⁴.

Defensible space, territorial functioning and social cohesion

Jane Jacobs⁵ first suggested in 1961 that certain city planning principles might reduce crime in urban residential areas. For example, buildings should be oriented to encourage a natural surveillance by residents, and public and private spaces should be delimited into clearly differentiable zones. Oscar Newman car-

ried these ideas further in the architectural design principles he labeled ‘defensible space’⁶. He suggested that certain physical features in the environment would encourage residents to exercise territorial control, which in turn would reduce crime and fear.

Taylor and Brower showed that territorial markers may convey a non-verbal message of control, separation from outsiders and investment in the locality. These are powerful symbolic signs of the extent of control, privacy, and identification^{7–10}. Territoriality, which is the claim for possession of space, may enhance satisfaction through improvements in social cohesion, whenever the frequency of human interactions responds to the same habitat. High interactions, pointing to high satisfaction with the environment, serve as both a motor and an indicator of satisfactory living conditions¹¹.

We suspect that both of these desirable intents depend to some extent on the actual inclusion of communication in the residential environment as an explicit theme of planning. We suggest with Perkins *et al.*^{12,13} that physical incivilities, markers of territorial functioning and defensible space features may each have an independent influence. Our concern here is to demonstrate the connection between objectively observed interactions, reported density of the social network, subjective dwelling satisfaction, and the design of urban areas within the building projects.

Methods

Six areas in publicly subsidized housings in the suburbs of Vienna (Austria) have been chosen (Table 1). All blocks were exclusively rent apartments.

Observation

The areas were randomly observed by one person during the summer after-

noons of 1993. The mean temperature during observation was 23 °C and no observation took place on rainy days. For the behavioral data collection we used a focal sampling with continuous recording¹⁴. A randomly selected person, (in this case the person 'in focus') was observed continuously from the moment he or she entered the setting up to the time he or she left the study site. Locomotory behavior (walking, standing, sitting), social behavior (greeting, talking, laughing, calling, touching, shouting), as well as other behaviors (eating, drinking, smoking) were noted and classified; for some, frequencies or durations were recorded as well, while, for others, a classification between exclusive or non-exclusive events was used. We also noted the number of persons in the area and, of course, characteristics of the focus (e.g., man/women/child). Altogether 1653 individuals were observed for a total of 80 hours. Observer[®], a software product specifically developed for data recordings in ethology, was well suited for this approach, as it logs not only frequency and duration of behaviors, but also behavioral overlaps, which are particularly frequent in humans. Data were logged on a hand-held Psion Organizer II, which is small, discreet, and unobtrusive.

Questionnaires

Fifty residents in each study block were interviewed between March and May 1994. Of the 300 persons, 41% were male. The average length of residence was 7.5 years, average age 36, most were 'employees', trained by apprenticeship rather than formal curriculum. The mean annual household net income was about US\$ 15,500. These parameters were homogenous across the six blocks.

Pairs of interviewers were located at the entrances to the housing areas and took anonymous interviews of passing residents. Questions were asked on satisfac-

tion with dwelling conditions, reason for satisfaction, social networks, satisfaction with environment and questions on demographic situations. Answers were registered on a 7-point Likert Scale. (For the questionnaire form, see APPENDIX I). Responses were kept anonymous.

Structural elements

The structural elements were partly assessed with the questionnaire described above, and partly conducted with an environmental inventory in April and May 1994. As in Perkins' Block Environment Inventory (1993), features are divided into two main sections. The 'permanent environment' contains the defensible space features; the transient, territorial functioning and incivilities. Defensible space is reflected in three subscales:

- real barriers that impede entry (we counted fences around the property, gates, and closed gates, bars on windows),
- symbolic barriers that do not impede entry but symbolize where public space ends and private begins (we counted outside and inside archways and registered the floor plan geometry - squared, round, etc.-, the floor types (patterns contrasting the areas from the pathways), and the direction of vertical deviation,
- in order to get the natural surveillance possibilities, the number of courtyard lamps were counted; visibility from outside was divided into two groups: visibility over the whole area and visibility over a part of the area (potential 'eyes and ears' were estimated by counting the dwelling units oriented towards the area).

In our case Perkins' so-called transient environment cannot be considered to be under total control of the residents in all aspects. The presence of territorial functioning features, for example, depend on the municipality, but is considered to

have the same effect as if made by the residents themselves.

- Thus we registered territorial functioning features such as plantings, outdoor seating, arbors, sculptures or other embellishments per area.
- For three months physical incivilities, such as litter and canine excrement alongside the pathways and vandalism like broken windows and dustbins were investigated once a week.

Statistical analysis

The data were not normally distributed (Kolmogorov-Smirnov test $P = 0.05$) and therefore non-parametric procedures for further processing were used. Comparisons between all variables were made using Kruskal-Wallis ANOVA and when this was significant, pair-wise (Bonferroni corrected) Mann-Whitney U-tests applied. The values were reported as boxplots with median, 25th and 75th percentiles. For bivariate analysis of nominal data, crosstabs were produced and Pearson's Chi-Square test calculated. A significant deviation of the observed from the expected frequency in the cells was

considered to be the case when the standardized residual was greater than or equal to 2¹⁵. Statistical significance was set at the 95% confidence level; the results are presented in the figures.

Results

In order to form categories of satisfaction the questionnaire was evaluated first.

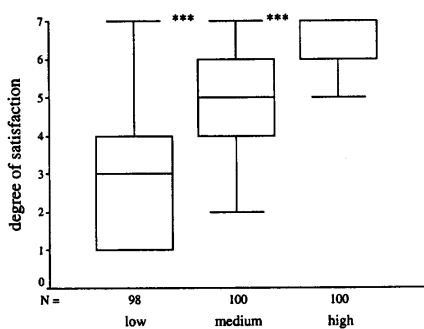
Subjective evaluation

The subjective evaluation revealed clear differences between the areas. First we ranked the six blocks by degree of satisfaction. Rank 1 and 2, 3 and 4, and 5 and 6 were grouped; in the following analysis they are labeled as high, medium and low satisfaction (Figure 1). Furthermore, the low satisfaction group specified the housing area to be the determining factor while the high satisfaction group held the environment and their apartment responsible for their judgement on dwelling conditions.

Figure 2 shows that the high satisfaction group claims to know their neighbors

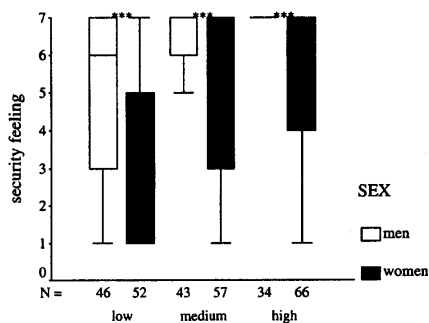
TABLE 1
 CHARACTERISTICS OF THE 6 HOUSE-BUILDINGS.
 Source: Czasny, K. & H. Feiglfeldt (1984). Großwohnanlagen in Wien. Institut für Stadtforschung, Wien. unpublished opinion poll. Marchart, P. (1994). Wohnbau in Wien. Compress Verlag, Wien

Name and address	Housing units (number)	Year of moving into	Builder
02. district: Engerthstraße 249-253	270	1982	municipality City of Vienna
10. district: Otto-Probststraße 3 »Wienerberg-West«	941	1988	municipality City of Vienna
17. district: Hernalser Hauptstraße 230-Alszeile 57-63	279	1987	municipality City of Vienna
20. district: Donaueschingenstraße 30 »Janecekhof«	783	1926	municipality City of Vienna
22. district: Rennbahnweg 27 »Trabrenngründe«	2407	1975/77	municipality City of Vienna
23. district: Karl-Torneygasse 43-47-Baslergasse-Porschegasse-Akaziengasse »Wiener Flur«	1361	1979 1980/81	municipality City of Vienna



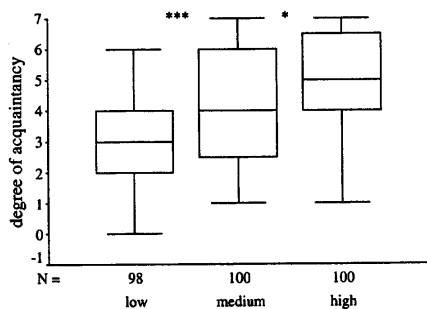
blocks grouped by satisfaction with dwelling conditions

Fig. 1. Satisfaction with living conditions in the blocks. A combination of two blocks in each group that did not differ statistically in the assessment of satisfaction. The ordinate gives the Likert scale from 1 to 7, where 7 is highly satisfied and 1 is not satisfied with the dwelling conditions. All three groups differ significantly in their satisfaction with the dwelling conditions (Values are median and 25th and 75th percentile. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ are differences in Mann-Whitney U tests).



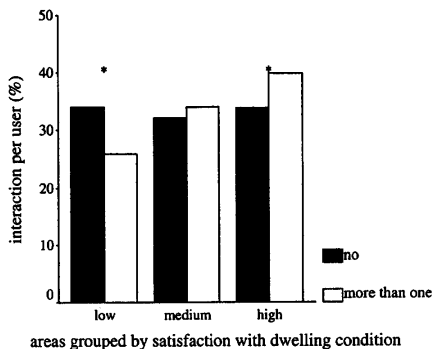
places grouped by satisfaction with dwelling conditions

Fig. 3. Feeling of security in the areas. In this graph, 1 represents feeling very unsafe in the area and 7 feeling very safe, answers are plotted for the three satisfaction groups. There are differences among the women from different areas; they differ significantly between the groups and from the men within each group. Men declare themselves to feel safe in any location, the women's feeling of safety increases with the satisfaction with the dwelling conditions (Values are median and 25th and 75th percentile. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ are differences in Mann-Whitney U tests).



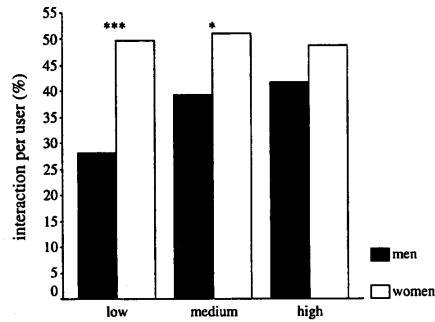
blocks grouped by satisfaction with dwelling conditions

Fig. 2. Social networks. On the ordinate scale, 1 is not knowing the fellow residents at all and 7 is knowing them very well. On the abscissa are plotted the satisfaction groups. The degree of acquaintancy increases significantly with the dwelling satisfaction. (Values are median and 25th and 75th percentile. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ are differences in Mann-Whitney U tests).



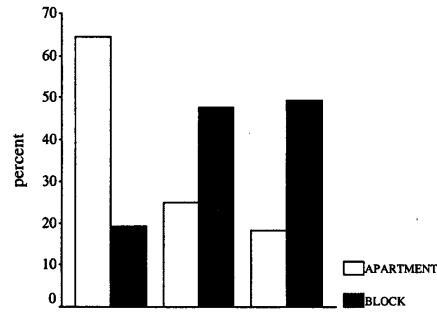
areas grouped by satisfaction with dwelling condition

Fig. 4. Frequency of interactions in the different areas. Interaction was defined as greeting, laughing, talking, calling, shouting, touching. The percentage of the cases when interacting occurs is highest in the highly satisfied group and significantly lower in the low satisfaction group (Pearson $\chi^2 = 25.98$, significant at the 0.01 level; * $p < 0.05$; $N = 1482$).



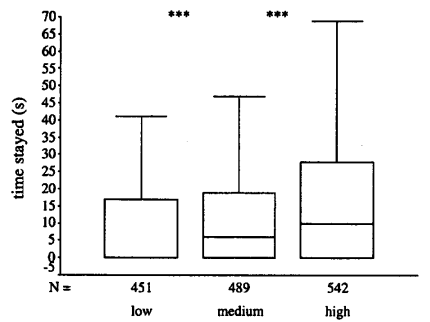
places grouped by satisfaction with dwelling condition

Fig. 5. Frequency of interactions among women and men. Interaction is defined as greeting, laughing, talking, calling, shouting, touching. The fraction of the interacting women is (statistically) equal in all three groups. In the high satisfaction group no significant differences between the sexes are evident, whereas there are significantly less interacting men in the two other groups (Pearson $\chi^2 = 25.98$, significant at the 0.01 level; * $p < 0.05$; $N = 1115$).



areas grouped by satisfaction with dwelling conditions

Fig. 7. Feeling at Home. Residential identification with the environment is higher in the more satisfied groups. The majority of the more highly satisfied specified their block as the point of entry where they feel at home, whereas the lower satisfied ones did not feel at home up to the apartment (Pearson $\chi^2 = 25.98$, significant at the 0.01 level; * $p < 0.05$; $N = 298$).



areas grouped by satisfaction with dwelling conditions

Fig. 6. Duration of staying in the areas. The duration of the time users stayed in the area increases significantly with the dwelling satisfaction. (Values are median and 25th and 75th percentile. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ are differences in Mann-Whitney U tests).

significantly better than the medium one (and the medium one better than the low one). Additionally, the frequency of meeting residential friends is also higher in the high satisfaction group.

This supports our hypothesis that satisfaction co-varies with stronger social cohesion. A higher degree of acquaintance is expected to be conducive to detecting strangers as potential offenders. Thus, the security feeling is assumed to be higher in the blocks with a higher satisfaction. Considering the security feeling of residents by group (Figure 3), we find a significant trend across levels of satisfaction. In fact, the women differ significantly between the groups and also differ from men within each group. The higher the satisfaction with dwelling conditions and the higher the degree of acquaintance, the higher the feeling of security.

Using the areas: behavior

'Interaction' may be defined as the union of all 'friendly' social variables, such as laughing, greeting, talking, touching, a walking together.

As Figure 4 shows, there is a higher percentage of 'interacting' men in highly satisfied areas and a significantly lower one in the two lower areas.

In order to get information about the sex ratio of interacting adults, we clustered the groups into men and women in Figure 5. In the high satisfaction group no significant differences between the sexes are evident, whereas an equal percent of women but significantly less interacting men are shown in the other two groups. Men seem to be the determining factor for these differences.

We defined the 'stasis time' as the time residents stood, sat, or squatted in the area, as distinct from simply walking. Duration of stasis time for the highly and the mediumly satisfied group were significantly higher than the mean for the low one, in which it was less than one second (Figure 6).

Structural elements

In order to acquire information about the residential identification with the environment, we asked residents for the point of entry to where they ultimately feel at home. The majority of the higher satisfaction group specified their block, whereas the less satisfied ones did not feel at home until within the apartment (Figure 7).

A similar result was revealed by the question concerning the areas - whether they are rated as private or public. The high satisfaction group valued the areas exactly along the middle (median = 4), whereas the lower the satisfaction, the groups judged the areas to be significantly less private (Mann-Whitney U-test, Bonferroni corrected $P < 0.001$).

The lowest satisfaction group even judged their areas to be completely non-private (median = 1).

We examined the structural features descriptively. All areas show relatively highly defensible space quality. The 'Territorial Functioning Scale' also showed interesting results because it may be said that markers convey the same message of territoriality, irrespective of by whom they were set.

Additionally,

- Block-closure around the area was over 75% in all blocks.
- Except for one highly satisfied block, at least 50% of the entrances were passages through archways.
- There were between two and five different floor-types found.
- Outside visibility was generally present, at least through archways.
- Good inside visibility was possible, at least along the pathways.
- Potential 'eyes and ears' were at least 25 dwelling units.

Associations with dwelling satisfaction were found as follows:

- Outdoor lighting was lacking in the areas of lowest satisfaction.
- Circular forms and art sculptures were centered in the high and the medium satisfaction areas.
- The center was elevated in the three highest ranked areas.
- The buildings in the two highest ranking areas had five or less floors and had arbors.

Fewer dwelling units per housing entry were counted in the higher satisfaction areas (9 -16) than in the areas with medium satisfaction (17), but up to 60 in the low-satisfaction group.

The physical incivility assessment also revealed differences between the ar-

eas: Litter was found in the two highly satisfied areas in 20% of the cases, in the medium satisfied areas in around 60% of the cases and in the two unsatisfied groups litter was detected in at least 70% of the observations. With animal excrement, the difference was even higher. Vandalism could be detected only in the worst area, in which the damage remained unrepaired throughout the study period.

Conclusions

We have shown that gradations in both defensible space features and the transient environment are linked with differences in subjective evaluation and the behavioral data. Areas in publicly subsidized housing schemes, defensible space and territorial functioning stimulate group identification, interaction along with resulting satisfaction with dwelling conditions. Furthermore, territorial functioning in its permanent form – men-

tioned above – is not just a measure for defensible space quality, but indicates its applicability as an independent improvement in quality. City-dwellers need an environment in which social interactions are available and with which it is possible to identify. Recent studies on public squares support similar findings^{16,17}.

Future work that takes a closer look at the evolutionary relevance of structures associated with dwelling satisfaction would do well to assess particular effects and causal connections.

Acknowledgements

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Appendix I

location: 1 = Wiener Berg, 2 = Engerthstr., 3 = Wiener Flur,
4 = Hernalser Hauptstr., 5 = Janecekhof, 6 = Rennbahnweg

coder:

date:

time:

refusals (number):

non-residents (number):

1.) For how many years are you living in this place?

2a.) How satisfied are you with the dwelling conditions here?

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
very unsatisfied *very satisfied*

2b.) Is the reason for this answer the apartment or the housing area?

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
apartment *housing area*

- 3.) **If you should move, would you like to live like you do now?**
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
no, not at all *yes, in any case*
- 4.) **How well do you know your fellow residents?**
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
not at all *very well*
- 5a.) **How many of your fellow residents do you meet in private?**
5b.) **and how often? 1 = more frequently than weekly,
2 = weekly, 3 = monthly, 4 = more rarely**
- 6.) **How secure do you feel walking alone here in the evening?**
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
very unsafe *very safe*
- 7a.) **How often do you spend your free time in this area?**
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
almost never *very often*
- 7b.) **Why so?**
1 = *other residents*, 2 = *children's playground*, 3 = *no time*,
4 = *garden*, 5 = *other*
- 8.) **Has this area a more public or a more private character for you?**
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
public *private*
- 9.) **Where is the point of entry when you feel at home?**
1 = *busstop*, 2 = *housing area*, 3 = *stairs*, 4 = *apartment*
- 10.) **What do you do for a living?**
1 = *student*, 2 = *labourer*, 3 = *trainee*, 4 = *housewife*, 5 = *pensioner*,
6 = *employee*, 7 = *self-employed*, 8 = *other*
- 11.) **What is the training you graduated from?**
1 = *elementary school*, 2 = *extended elementary school*, 3 = *training school*,
4 = *secondary school*, 5 = *university*
- 12.) **How old are you (years)?** **Sex:**
- 13.) **How much money do you earn per month (net) in Austrian Shillings?**
1. $\leq 14.999,-$
2. $15-19.999,-$
3. $20-24.999,-$
4. $25-29.999,-$
5. $\geq 30.000,-$
6. *no answer*

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VIDOVI EVOLUCIJE ČOVJEKA I URBANE STAMBENE TVOREVINE

SAŽETAK

Planiranje i arhitektura suvremenih stambenih naselja trebala bi uzeti u obzir činjenicu da blagostanje ljudi u velikoj mjeri ovisi o potrebama izvedenim iz prirodoslovnih vidova ljudske evolucije, koji uključuju teritorijalnost, sigurnost i ravnotežu između privatnosti i javne djelatnosti. Premda bi dobri stambeni projekti morali uzeti u obzir prostor, prečesto se zanemaruje potreba za privatnošću i važnost okoline stanovanja. Moguće posljedice su gubitak društvene povezanosti, što dovodi do anonimnosti, vandalizma i povećanja kriminala. Na temelju teorije igre, pretpostavljamo da će sklonost suradnji rasti s povećanjem vjerojatnosti budućih susretanja među stanovnicima. Očekuje se da će međudjelovanje biti to veće, što je veća vjerojatnost ponovnog susreta s drugim stanovnicima. Česti susreti dovode do međusobnog prepoznavanja i omogućuju stanovnicima da kontroliraju svoju okolinu prepoznajući strance. Taj mehanizam dovodi do identifikacije sa zajedničkim teritorijem. Prijateljski odnosi među stanovnicima su pokretač i pokazatelj zadovoljavajućih uvjeta života. Za ovo istraživanje odabrano je šest bečkih stambenih blokova, te je njihov kvalitet mjeren putem obrazaca. Ponašanje stanovnika bilježeno je standardnim etološkim metodama (N = 1653), subjektivnost ocjenjivanja procjenjena je razgovorima na licu mjesta (N = 300), te je bilježena učestalost fizičke nepristojnosti.