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THE UNIVERSITY OF ALBERTA

DENSITY AND CROWDING

by

A.R. GILLIS

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled Population Density and Crowding submitted by A.R. Gillis in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

This thesis is an examination of some of the conditions under which population densities are associated with individual discomfort (crowding).

A review of the literature reveals that three general types of population density have been found to be related to a variety of variables which have been typically classified as "social pathologies". The types of density are: (1) internal density (persons per room), (2) external density (persons per acre), and (3) building density (persons or units per structure). A preliminary investigation using the census tract as the unit of analysis, and rates of public assistance and juvenile delinquency as indicators of "social pathology", finds building density to be a better predictor of the dependent variables than are internal or external density.

This section of the thesis concludes with a discussion of the inadequacies of the concept "social pathology" and the limitations of aggregate data and post factum designs for research on the effects of population density on individuals.

The model used to guide the principal research in this thesis views population density interacting with demographic, social, and psychological variables (as stress)

producing crowding (as strain). Two types of strain are isolated as dependent variables (psychological and environmental strain), and stimulus overload and inhibition are suggested as possible intervening variables. Life style, perceptual reactance, and perceived similarity to neighbours are discussed as variables that could logically be expected to interact with density on crowding.

A structured interview administered to a multi-stage sample of 442 residents of public housing projects in Edmonton and Calgary, Alberta provides the data. Regression is the principal technique used in data analysis.

Small but statistically significant correlations are found between internal density and psychological strain, and building density and environmental strain. External density is unrelated to either of the dependent variables. Internal density interacts with life style, perceptual reactance, and perceived similarity to neighbours as a predictor of psychological strain, and building density interacts with life style and perceived similarity to neighbours as a predictor of this type of strain. External density does not interact with any of these variables on psychological strain. Neither stimulus overload nor inhibition seems to intervene between density and psychological strain under any of the conditions included in the analysis, and no evidence is found to suggest the relationships

between population density and environmental strain are non-additive.

The final analysis focuses on four design factors associated with building density (shared walls, shared floor, shared ceiling, and height), and their relationship to strain. Height is found to be a positive predictor of psychological strain for mothers and a negative predictor for fathers. Height is also shown to be a positive predictor of environmental strain for respondents reporting an active life style.

The foregoing relationships are discussed with respect to social policy and theory and future research concerning the effects of population density on people.

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CHAPTER I

TYPES OF POPULATION DENSITY AND SOCIAL PATHOLOGY

> Men are not made to be packed together in ant-heaps, but scattered over the earth to till it. The more they are massed together, the more corrupt they become. The infirmities of the body and vices of the soul are the necessary result of this too numerous concourse. Of all animals man is least fitted to live in herds. Men packed like sheep would perish in very little time. The breath of man is fatal to his kind: and this is literally true, no less than figuratively.
>
> Rousseau, Emile

Meadows (1957) notes that a moral dichotomy seems to exist among scholars with respect to the value of cities to mankind. On the one hand, cities have been viewed as the precoursers of productivity and progress, centres of the arts and high "culture", and the guardians and administrators of the "civilized" (see for example, Redfield and Singer, 1954).

On the other hand, cities have been found historically to have higher rates of morbidity and mortality (Dorn, 1959;

Langer, 1964, Loomis, 1970), severe mental illness, suicide, crimes of violence, illegitimacy, and divorce (Berelson and Steiner, 1964) than rural areas.

On a theoretical level, social science has tended to see "malaise" as an inevitable outcome of the urban setting (Fischer, 1972).

The city has been defined sociologically as a high density settlement of heterogeneous individuals (Wirth, 1938), and it is the high density aspect of city life that seems to be regarded as one of the most salient factors in the alleged negative effect of the urban setting on man.

Speculation on the relationship between population density and human behaviour has burgeoned since Calhoun's well publicized[1] description of the "behavioral sink" appeared in 1962. The behavioral sink was Calhoun's term for the activities of rats in experimental situations of high population density. These activities ("rape", infanticide, cannibalism, among others) are abnormal for rats in usual, low density situations, and from the viewpoints of most human cultures, are undesirable or "pathological".

Popular concern for the effects of high density on human behaviour has no doubt been encouraged/reflected by Ardrey (1966, 1971), a plethora of speculative magazine

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[1] Galle et al. report that the findings of the Calhoun study have become a propaganda item for the Planned Parenthood Association (Galle et al., 1972b).

articles (see Zlutnick and Altman, 1972) and the works of various popular ethologists such as Lorenz (1967) and Morris (1967, 1971), who approach the notion of environmentally determined behaviour, even though they stress biological determinism.

Many empirical examinations of the effects of population density have involved studies of non-human animals. These studies can be seen as falling into one of two categories: "natality-mortality" studies and "social pathology" studies.

Natality-Mortality Studies

Natality-mortality studies have typically found an inverse relationship between population density and natality (Chipman et al., 1966; Clulow and Clarke, 1968; Laws and Parker, 1968; and Perrins, 1965), and a direct relationship between population density and mortality (Christian, 1950; Christian and Davis, 1964; and Christian et al., 1961).

Non-human animal research where social pathology has been found to be a correlate of density include experimental studies (Calhoun, 1962; and D. Morris, 1952), and non-experimental research (Sugiyama, 1967).

Though the findings of ethologists are inspiring, great care must be exercised when examining their implications for man. First, not all animals may be adversely affected by

high density. For example, one study of African vervet monkeys found an inverse relationship between population density and social disorganization (Ardrey, 1970:225). Second, man is believed to be significantly different from the other animals (Alland, 1972). There is allegedly greater variation in responses to environmental constraints within the human genus than within non-human genera. Di Pietro, 1973, has noted that some human languages do not even have words for the English notion of "privacy". This may reflect cultural variation in man's reaction to high density situations. Further, human technology may enable man to block adverse behavioural effects of population density by lending to high density situations the illustion of spaciousness through the use of appropriate architectural design.

"Social Pathology" Studies

However, in spite of his differences from other animals, man may be adversely affected by population density. In 1963 Schorr produced a study of secondary data drawn from empirical analyses of human population density and associated attitudes and behaviours. He concluded that high density produces stress, pessimism, apathy, feelings of malcontent, a dislike of solitude, poor physical health, and difficulties in child rearing, among other things (Schorr, 1963). A number of

studies completed since Schorr's research seem to support his conclusions.

Research on human responses to high density can be divided into two categories: experimental and non-experimental studies.

Experimental research dealing with the effects of high density on human behaviour has found that: males are more competitive and punative, females are less so in high density situations (Freedman, 1971); interpersonal attraction varies inversely with density and air temperature (Griffith and Veitch, 1971); normal, autistic, and brain-damaged children differ in their responses to high density (Hutt and Vaizey, 1966); and interaction and aggressive behaviour among nursery school children and among adults vary directly with density (Hutt and McGrew, 1967).

Findings of surveys using census tracts as units of analysis indicate that psychological strain, mental illness, and aggressive behaviour are related to density (Chombert de Lauwe, 1959; Collette and Webb, 1974). Mortality, fertility, public assistance, juvenile delinquency rates and rates of admissions to mental hospitals have also been directly related to density (Galle et al., 1972a). In addition, child supervision is inversely related to density (Mitchell, 1971), mental illness, venereal disease, tuberculosis, illegitimacy, and crime rates are directly related to density (Schmitt, 1966),

and juvenile delinquency and adult crime rates are directly related to density (Chilton, 1964; Schmid, 1960; and Wallis and Maliphant, 1967).

Explaining the Findings

The foregoing studies support the hypothesis that man, like many other animals, is adversely affected by high population density.

The fact that man seems to be similar to other animals in this regard has encouraged attempts to locate one general explanation for the relationship between density and behaviour. One such explanation involves a model of a cybernetic system. That is, under high density conditions, the animals in a population receive more, and possibly more intense, stimuli, which result in changes in the adrenalin system (Christian and Davis, 1964). The changes in the adrenalin system affect metabolism rates, which produce a greater susceptibility to strain-related diseases and changes in behaviours (Esser, 1973). These changes tend to increase mortality rates and decrease natality rates, which combine to reduce population size and density.

This approach to the explanation of the density-behaviour relationship among humans has a number of strong points. For example, it can explain a variety of behaviours

such as the rise of "Women's Liberation" movements as an adaptive reaction against motherhood and its consequence, population growth. This theme has also been used to account for the increased tolerance of homosexuality and incidence of homicide as population-limiting mechanisms. Further, because of its focus on change, this approach, when employing the idea of cultural lag, can explain why the new adaptive behaviours are construed as deviant, disorganized, or pathological. (I.e., they are new and depart from previous patterns of action which resulted in population increases, a eufunction in past circumstances.)

Contrary Findings

Although there is some empirical support for the hypothesis that population density is related to social pathology among humans, all data are not supportive. First, Galle et al. (1972a) and others report that human natality increases rather than decreases with population density. This is incongruent with the notion that high density produces patterns that result in population decreases. Second, a number of studies have found no direct relationship between human population density and social pathology (Draper, 1973; Loo, 1972; Schmitt, 1963; Wilner et al., 1962; and Winsborough, 1965). Further, Hawley (1972) notes that since 1950 the

population density of inner cities has been declining, yet a corresponding decrease in social pathology is not apparent.

Data, then, both support and refute the hypothesis that human population density is directly related to social pathology.

Rather than take the position that one side is correct and the other incorrect (studies on both sides include experimental and ex post facto designs and vary widely in rigor), we will assume that both supporting and refuting data contain an element of accuracy.

Accounting for Diverse Research Results

Several factors could contribute to the conflicting data regarding the relationship between density and social pathology. Differences between researchers' indicators of social pathology, differences between the populations examined, and differences between researchers' indicators of density could result in conflicting findings.

First, "social pathology" is an ambiguous concept. The wide variety of attitudes, behaviours, and conditions that have been included under this rubric appear to share only one characteristic: they are widely defined as "undesirable". Consequently, some behaviours that are considered pathological may be found to be related to density, while others may not.

For example, Winsborough's discovery that density and tuberculosis rates are inversely related, need not conflict with the finding by Galle et al. that density and juvenile delinquency are directly related. A conflict can be seen only if both tuberculosis and delinquency are seen as social pathologies or indicators of social pathology.

Second, as mentioned before, there is great socio-cultural variation among humans. Hall (1959, 1966), Sommer (1967, 1969), Rapoport (1969), and others have shown how these factors affect people's creation and use of space, as well as their reactions to it. Social or cultural factors then, could conceivably affect the degree to which density is related to behaviour. For example, in Honolulu Schmitt (1966) found certain behaviours and conditions associated with density that were apparently unrelated to density in Hong Kong (Schmitt, 1963). These populations may differ in their responses to density because of socio-cultural or even demographic differences. One factor that could be operating here is cultural homogeneity. Hong Kong has a much more homogeneous population than Honolulu. It is possible that people can tolerate higher densities if the persons with whom they share their space are similar to them in culture.

Finally, population density is a more complex variable than many researchers may realize. There are different types of density, and each type may have different effects on people and their behaviours (Day and Day, 1973).

As Michelson (1970) notes, the importance of density lies in the degree to which people are or are not separated from other people. Since humans build structures to separate themselves from one another, the number of square units of space per person is, by itself, an inadequate indicator of the degree of separation of an individual from other individuals. In view of this, Michelson has recognized three kinds of density, each one involving different physical dimensions and the separation of different sets of people. These are: (1) internal density - the number of persons per room within a household; (2) building type - the number of persons per building; and (3) external density - the number of persons per square units of space within a given area of residential land such as a neighbourhood, polling district or census tract (Michelson, 1970).

Michelson's three types of density involve both different spatial dimensions and different sets of persons. Internal density concerns the spatial dimensions of the dwelling unit and the separation of the members of one household. Building type involves the building a household occupies, and the separation of one household from other households. (It should be noted here that design variation within types of buildings, particularly multiple family housing, may be as important as variation between building types.) External density involves the physical neighbourhood

and the separation of the residents of one building from the residents of other buildings, and the separation of individuals or households from each other when they are outside their dwellings.

The relationship between the three types of population density and human behaviour is unclear. Schmitt (1966) for example, found that in Honolulu external density was strongly related to a variety of indicators of "social disorganization", while internal density was weakly related to these variables, and the link with building type was weaker still. Galle et al. (1972a) found that in Chicago internal density was the strongest correlate of their indicators of social pathology, followed by building type and external density respectively.

The findings of Schmitt and Galle et al. not only conflict with respect to the importance of internal and external density, but the two studies produced divergent assessments of the relative importance of building type as a correlate of social pathology.

In addition to the research done by Galle et al., several studies done at the individual and building levels of analysis support the notion that building type is an important correlate of conditions and behaviours regarded as "pathological".

Fanning (1967) not only found higher rates of neuroses among apartment dwellers than house dwellers, but he also discovered that rates of neuroses were directly related to the height of apartment buildings. This research is doubly important in that it eliminates the possibility of a selection factor operating. The sample consisted of British servicemen who did not have a choice as to the placement in a house or apartment. Firey (1947) held that persons with particular behaviour patterns select certain areas in which to live. In such a case, behaviours and building types would be related, though building type would in no way produce the behaviours.

Building type seems also to be associated with crime and delinquency. In Newman's (1972) recent study of low-income housing, he found that certain building layouts are more often the scenes of crimes than others. Further, Newman noted that the frequency of robberies increased with building height.

Newman made the point that some spatial configurations are more appropriate than others for criminal behaviours because some spaces are less easily observed and defended by the residents. His principal focus was on the scenes of offences rather than the residences of offenders. However, the type of building in which offenders live may also be a factor, particularly in the case of juveniles. Wallace (1952)

and Kumove (1966) found that juveniles in high-rise apartments recieve less parental supervision when outside their dwellings than do their counterparts in single detached houses. Hirschi (1969), Nye (1968), and Thrasher (1963) concluded that poor parental supervision was an important correlate of delinquency, and Yancey (1972) reports that building type and design and informal disorganization combined to reduce child supervision and inflate delinquency in St. Louis' Pruitt-Igoe project.

The Present Research

In view of the ambiguity of the literature with respect to the relative importance of building type, internal density and external density, we undertook a study comparing the relative strengths of these types of population density as predictors of certain "social pathologies" in Edmonton, Alberta.

Our research generally followed the format of the study done by Galle et al. (1972a). However, because of data limitations, only two of the five social pathologies examined by Galle et al. were examined. These were rates of public assistance (social allowance case rates) and rates of juvenile delinquency. (Note: social allowance payments in Canada are analogous to state welfare payments in the U.S.)

As in the Galle et al. study, the unit of analysis for this investigation was the census tract. Also, our study controlled for the effects of ethnicity and socio-economic status, as did Galle et al. "Percent Anglo origin"[2] and "Mean family salary or wage" were used as measures of ethnicity and S.E.S., respectively. The proportion of the total number of dwellings which are multiple-family structures was used as a measure of building type for each census tract.

There are two problems with the data. First, only 30 of Edmonton's 45 census tracts could be used. (External densities had not been calculated individually for the 15 excluded tracts.) However, regarding the other relevant variables, the excluded tracts do not differ significantly from those which are included in this study. Second, though 1961 density rates and measures of the control variables are used, the measures of public assistance rates and juvenile delinquency rates for that year are unavailable. Consequently, the 1966 rates (the nearest to 1961 available) are used as proxies for the 1961 rates of public assistance and juvenile delinquency.

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[2] Galle et al. concerned themselves with proportion of non-whites. Since the proportion of non-whites in Edmonton is low, with little variation between census tracts, we elected to use percent Anglo origin as an indicator of the ethnic factor.

Results

Internal density and building type seem to be clearly separate dimensions of density (r = -.06). External density however, is related to building type (r = .48). This relationship between external density (number of persons per residential acre) and building type (proportion of multiple dwellings) is easy to interpret: the greater the proportion of multi-storey apartments in a given area, the higher the external density of that area. Galle et al. found that most of the variation in external density could be explained by building type and the number of buildings per acre.

Finally, internal density (the proportion of dwellings with more than one person per room) is weakly correlated with external density (r = .16).

The associations among the three measures of density and public assistance and delinquency are shown in Table 1.

The relative importance of building type can be seen in Table 1. This variable is strongly correlated with both delinquency and public assistance rates (.58 and .55 respectively). External density is moderately correlated with both public assistance (.38) and delinquency rates (.31), and internal density has a reasonably strong correlation with public assistance (.48), but a very low correlation with

TABLE 1

Zero-Order Correlation Coefficients for Internal Density External Density, Building Type, Public Assistance and Juvenile Delinquency

	Internal Density	External Density	Building Type	Public Assistance	Juvenile Delinquency
Internal Density	1.00	.38	.00	.48	.07
External Density		1.00	.47	.38	.31
Building Type			1.00	.55	.58
Public Assistance				1.00	.66
Juvenile Delinquency					1.00

delinquency (.07). Initial examination, then, indicates that building type is a better predictor than either external or internal density. However, to examine more closely the effects of these variables on the dependent variables, we used a stepwise regression analysis. Table 2 contains the summary of the findings for the three dimensions of density and the two dependent variables.

Of the three types of density, building type is the variable "accounting for" most of the variation in public assistance (30%) and delinquency (34%).

Despite the fact that the zero-order correlations of external density with public assistance and juvenile delinquency are $r = .38$ and $r = .31$ respectively, the addition of external density to the prediction equation adds nothing to its predictive power. The beta weights (standardized partial slopes) of $b = .03$ for public assistance and $b - .01$ for delinquency show that the "direct effects" (Land, 1969) of external density are minimal. Consequently, the moderate zero-order correlations are due to real or spurious covariation of external density with the other variables in the equation.

Though the addition of internal density to the prediction equation for delinquency adds little predictive power, internal density is an important predictor of public assistance. Internal density predicts 26 percent of the

TABLE 2

Summary of Stepwise Regression of Public Assistance Rates and Juvenile Delinquency Rates on Building Type, Internal Density, and External Density

	Multiple r	r^2	r^2 Change	Level of Significance (equation)	Beta Weight (b)
Public Assistance					
Building Type	.55	.30	.30	.01	.56
Internal Density	.75	.56	.26	.001	.51
External Density	.75	.56	.00	.01	.03
Juvenile Delinquency					
Building Type	.58	.34	.34	.001	.59
Internal Density	.59	.35	.01	.01	.10
External Density	.59	.35	.00	.01	.01

variation in social allowance after the variation "due" to building type has been removed.

Attending to the procedure of Galle et al., income and national origin were included with the three types of density in prediction equations for public assistance and delinquency. Table 3 gives a summary of the relative strengths of the predictor variables.

As could be expected, income is the strongest correlate of public assistance, predicting 50 percent of its variation. Building type and internal density follow, predicting an additional 6 percent and 4 percent respectively. National origin and external density add nothing to the predictive power of the equation.

It is noteworthy that the path coefficient for public assistance on income is $b = -.29$, while that of public assistance on building type is $b = .41$. This reflects the relative independence of building type from the other predictor variables. In contrast, income is very strongly correlated with national origin ($r = .72$) and internal density ($r = .64$).

In the case of juvenile delinquency the strongest correlate is building type, predicting 34 percent of the variation. Income and national origin follow, accounting for an additional 5 percent of the variation in delinquency. Neither internal nor external density are important additions

TABLE 3

Summary of Stepwise Regression of Public Assistance Rates and Juvenile Delinquency Rates on Income, National Origin, Building Type, Internal Density and External Density

	Multiple r	r^2	r^2 Change	Level of Significance (equation)	Beta Weight (b)
Public Assistance					
Income	.70	.50	.50	.001	-.29
Building Type	.75	.56	.06	.001	.41
Internal Density	.77	.60	.04	.001	.30
National Origin	.77	.60	.00	.001	-.05
External Density	.77	.60	.00	.01	.01
Juvenile Delinquency					
Building Type	.58	.34	.34	.001	.50
Income	.60	.36	.02	.01	-.35
National Origin	.63	.39	.03	.01	.24
Internal Density	.63	.39	.00	.05	-.02
External Density	.63	.39	.00	--	.02

to the prediction equation. Once again, building type has the strongest direct "effect" on the dependent variable ($b = .50$).

Conclusions and Discussion

Insofar as public assistance and juvenile delinquency can be considered social pathologies, several conclusions can be drawn from this study.

First, both internal density, as indicated by the proportion of dwellings with more than one person per room, and external density, as indicated by the number of persons per residential acre, are related to social pathology. Internal density is more highly correlated with public assistance than is external density, and external density is a stronger correlate of delinquency than is internal density (Table 1).

Second, when the effects of building type, as indicated by the proportion of multiple dwellings, are removed, internal density "explains" more of the variation in both dependent variables than does external density (Table 2).

Third, building type is a better predictor of the dependent variables than are internal or external density (Table 2).

Further, when the effects of income and national origin are removed, building type is the only measure of density that is still related to both dependent variables beyond the .05 level of significance.

In one respect, the data are more supportive of the findings of Galle et al. than they are of Schmitt's. Galle and his associates found building type to be a stronger correlate of their indicators of social pathology than was external density. (Building type was especially important in the case of juvenile delinquency.) Further, the Chicago and Edmonton data imply that external density is the result of building type and number of buildings per acre, and that the relationship between external density and public assistance and juvenile delinquency is spurious. Had Schmitt been able to control for the effects of both building type and buildings per acre, his findings might have been similar.

In another respect, however, the Edmonton data do not support the findings of Galle et al. Our data show building type to be a stronger correlate of public assistance and juvenile delinquency than is internal density, and in the case of juvenile delinquency, the correlation with internal density is negligible.

Further research on the relationships between densities and pathologies should be guided by several considerations:

First, this research, like other post factum studies, has not indicated whether the links between the "independent" and "dependent" variables are causal. (For a detailed discussion of the elements of causal explanations see Nettler, 1970.)

By adopting the density-pathology perspective used by ethologists, researchers run the risk of assuming that density produces behaviours, when in reality, people exhibiting social pathologies may be attracted to, or forced into, high density situations. The relationship between building type and public assistance is a case in point. It is difficult to conceive of building type causing public assistance. On the other hand it is reasonable to assume that individuals who receive public assistance are attracted to multiple dwellings because they are less expensive than single, detached houses.

Whether building type produces juvenile delinquency or attracts families containing delinquent children is a more complex question. Of all the variables examined in this study, public assistance is the best predictor of delinquency ($b = .59$). By attracting families receiving public assistance, then, multiple family dwellings can be seen to be indirectly attracting delinquents. However, of all the predictor variables examined, building type is second only to public assistance as a predictor of delinquency.

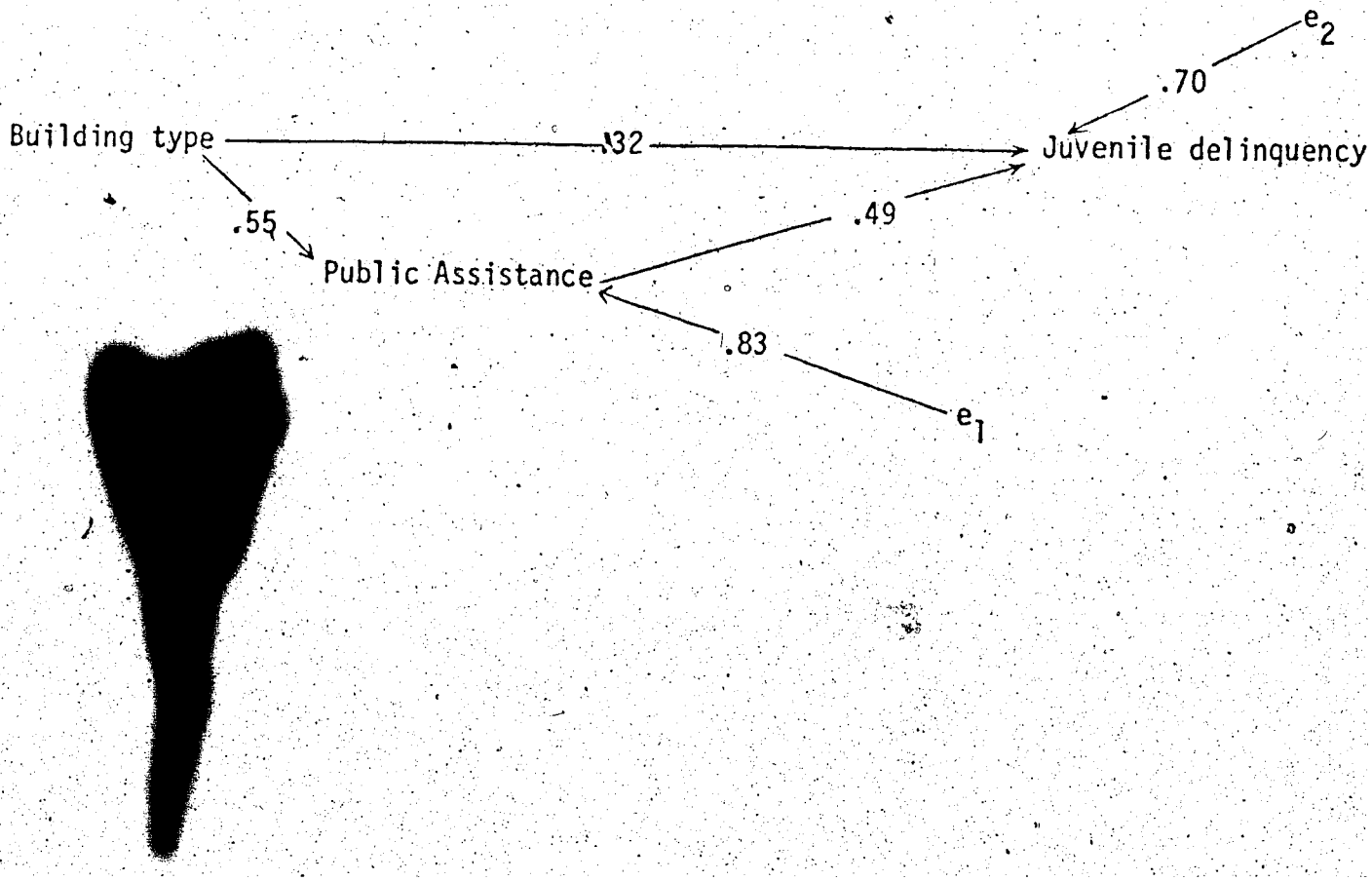
Consequently, though the path coefficient of delinquency on building type is reduced by including public assistance in the prediction equation, building type continues to have a significant direct effect on delinquency (see Figure 1). Whether this "effect" involves producing delinquents in a causal sense, or attracting families containing delinquents is unknown. Building type may indeed encourage delinquency through the control problem discussed earlier, or attract delinquency-prone families, or it may "do" both.

It is clear that the relationship between building type and juvenile delinquency requires further research. It is also clear that the density-pathology perspective is an over-simplified viewpoint. By lumping undesirable conditions and behaviours together under the rubric "social pathology", one may be inclined to ignore not only the nature of the relationships between density and the dependent variables, but the relationships between the dependent variables themselves.

"Social pathology" is a general concept with a multitude of indicators. Consequently, to test adequately any relationship between social pathology and another variable is an arduous task. Further, many of the indicators of social pathology have questionable external validity. For example, it could be forcefully argued that public assistance is as much a sign of social "health" as "pathology".

FIGURE 1

A PATH MODEL OF BUILDING DENSITY, PUBLIC ASSISTANCE, AND JUVENILE DELINQUENCY



In view of the foregoing, social scientists might be well-advised to search for a less general effect of population density (or for that matter any independent variable) than that of "social pathology".

The conceptual inadequacies of "social pathology" have probably been an important factor in impeding the development of any empirically supported logical statement of why density and social pathology are causally linked. If we are to develop a body of social scientific knowledge regarding the effects of population density on people, then, we should narrow the scope of the dependent variable to a point where: (a) the dependent variable can be defined and measured with an acceptable degree of accuracy, and (b) the dependent, intervening, and independent variables can be logically linked in propositional form without violating the scientific preference for parsimony. In this way we may ultimately develop a series of "middle range" theories that can be extended and combined to form a general theory of the effects of population densities on people (cf. Merton, 1968, for a detailed discussion of the utilities of middle range theories).

Second, the distinctions between various types and designs of multiple-family dwellings should be examined in greater detail with respect to their human conditions and behaviours. The distinction between single, detached houses

and multiple-family structures is crude. Multiple-family structures range from duplexes, containing two households, to large high-rise apartments with hundreds of households. Further, regarding the separation of one household from other households, we find variation within apartment buildings by location of dwelling units. For example, the end units of row houses are similar to duplexes in that only one wall is shared. Centre units share two walls. (It is interesting to note that end units often have higher rents because of their greater isolation.) The number of shared barriers (walls, floors, and ceilings) range from zero, in the case of a single, detached house, to four (two walls, floor and ceiling), in the case of a centrally located suite in a multi-story apartment building.

The most important social component of population density is the separation of people (Michelson, 1970). Shared barriers (walls, floors, ceilings) implies a lower degree of separation of households than do unshared barriers (particularly with respect to the passage of sound). Hence, research on the effects of the separation of households should perhaps consider both the effects of building design and the number of barriers dwelling uints share as independent and intervening variables, respectively.

Finally, and of greatest importance, further research on population density and behaviour should use individuals or

households as the unit of analysis. By doing this, the relationships found by studies of census tracts can be tested for individuals and their dwellings.

The discovery of relationships at one level of analysis does not mean that these relationships will hold at another level of analysis. For example, the fact that the proportion of multiple dwellings is related to the public assistance and delinquency rates of census tracts, does not necessarily mean that individuals or households with these characteristics actually inhabit multiple dwellings. Robinson (1950), and more recently Hannan (1970), have shown that changes in levels of analysis involve strict assumptions which are rarely met by sociologists' data. Consequently, if one is concerned with individuals, in most circumstances he is best advised to use the individual as the unit of analysis.

A second advantage of using the individual as the unit of analysis is the attention that can be given to psychological factors. Lowenthal and Riel (1972) have shown that mental clusters of attitudes are related to individuals' perception of their environment, and Stokols (1972), Stokols et al. (1973), and Zlutnick and Altman (1972) have pointed out that the human perception and definition of high density as undesirable ("crowding") varies. Such may also be the case with different types and designs of buildings.

Psychological as well as socio-cultural factors, then, may interact with dwelling environments on behaviours.

CHAPTER II

STRESS, STRAIN, AND CROWDING

We noted in the first chapter that one of the major deficiencies of previous research on the correlates of population density has been a concern with linking population density to "social pathology". This concept is vaguely defined, too broad to permit satisfactory empirical analysis, and has not been clearly shown to be a logical result of population density.

In view of the problems associated with social pathology as a concept and variable, we will attempt to locate a concept that is more specifically defined and operationalized than social pathology, and one that can be viewed as a logical consequent of population density.

Social scientists who have examined the relationship between population density and social pathologies have been implicitly concerned with crowding. High population density has been portrayed as a producer of individual

distress, which manifests itself as some social pathologies (e.g. psychological strain, irritability, physical and mental illnesses, etc.) and leads to others (e.g. role impairment, criminal and delinquent behaviours, etc.). However, until very recently it has been assumed that a one-to-one correspondence exists between population density and discomfort with it (i.e. crowding). Consequently, social scientists have devoted little direct attention to the relationship between population density and crowding.

There are several reasons for this study's focus on the relationship between density and crowding.

As pointed out in the initial chapter, whether there is a relationship between population density and conditions and behaviours is unclear. Studies both support and refute this proposition. Since it is possible that some populations are better equipped than others to avoid the effects of relatively high population densities, this could account for many of the divergent findings of previous studies.

The discovery of variables that interact with population density on crowding could have a practical as well as an academic impact, particularly in the case of building type.

High density multiple-family housing is becoming more widespread in Canada (Kalbach and MacVey, 1971) and shows no signs of decreasing. Land, labour, and material

costs may ultimately confine a major proportion of the Canadian and world populations to multiple-family dwellings. In view of this, information pertaining to building design and discomfort could be of value to government housing policy makers and private developers regarding which designs are associated with feeling crowded for which "types" of people. For example, some designs may be widely associated with crowding, suggesting that few, if any, of these dwellings be constructed in the future. A more likely finding might be that some designs are associated with crowding, but only for certain categories of people. This information could be used profitably by landlords and government agencies in advising individuals of the probabilities of their finding a particular building design to be a source of dissatisfaction

Both academic and non-academic benefits then, may accrue from the study of the relationship between population density and crowding.

Population Density, Crowding, and Discomfort

To distinguish population density from crowding is to acknowledge that all people or categories of people do not necessarily feel equally uncomfortable with any given level of population density, especially in situations of moderate or low density. That is, most, if not all people

would probably experience discomfort if placed in situations of extremely high levels of population density for indefinite periods, (though some might be more quickly or more severely affected than others). However, in situations involving more moderate levels of population density, some individuals, or categories of people, may feel crowded and others not. The relationship between population density and crowding seems unlikely to be a simple one-to-one correlation, with all people feeling very uncomfortable in high density situations, and all people feeling somewhat uncomfortable in situations of moderate density.

The relationship between population density and crowding may also be non-linear. Stokols (1972b) notes that people can be either crowded or "undercrowded". That is, people can experience discomfort in situations involving very high or very low population density.

Though there seems to be no direct empirical support for this viewpoint, it has intuitive appeal and some indirect empirical support. For example, both the "Black Hole of Calcutta" (involving very little separation of individuals from each other) and solitary confinement (involving extreme separation of an individual from others) are generally regarded as punishments. Also, with respect to suffering from excessively low population densities, relatively few people seem to adopt voluntarily the life of a hermit. In

fact, "isolation pay" (involving higher than normal wages) is commonly paid to individuals to work in the less densely populated sections of Canada, implying that low population density and associated factors are not as desirable as moderate levels of population density.

The above discussion refers primarily to external density. However, there is direct empirical support for suggesting that the relationship between internal density and discomfort is non-linear. Both Chombert de Lauwe (1959) and Galle et al. (1972a) found that the relationship between this type of density and mental distress was U-shaped. (It cannot be over-emphasized that post factum studies such as these have not demonstrated that population density causes distress. It is at least just as plausible that distressed persons choose to live alone, or are forced to do so, and that this accounts for an overabundance of distressed people in low internal density situations.)

In the case of building type, an overwhelming majority of people report preferences for single, detached houses (Michelson, 1968), yet, many people in some social categories (notably older people whose children no longer live with them) move from single, detached houses to multiple family dwellings (Hauser, 1960; Meyerson et al., 1962, Michelson, 1970). Though it may seem unlikely that this reflects dissatisfaction with low density living, to assume

a priori that the relationship between building type and discomfort is linear may be hazardous.

The relationship between the different types of population density and individual discomfort, then, seems likely to be complex. Relationships may be non-linear, and seem very likely to be affected by other variables.

Crowding as Strain

Crowding is an "experiential" or "psychological" state involving a feeling of dissatisfaction or discomfort with the amount of space one has at his disposal, insofar as the amount of space is regarded to be insufficient (cf. Desor, 1972; Proshansky *et al.*, 1970, 1972; Stokols, 1972a, 1972b; Stokols *et al.*, 1973; Zlutnick and Altman, 1972).

Stokols (1972a, 1972b) points out that feeling crowded is the consequence of population density mixed with personal characteristics, life style, and past experience with spatial limitations in interaction. That is, whether an individual feels crowded depends on the level of population density of his environment and his own personality and history.

To Stokols, crowding is a *motivational state*, directing an individual toward easing the disparity between

preferred and actual situations. This can be achieved in the case of crowding by altering one's preferences as to population density or by lowering the level of population density in one's environment (e.g. moving to an environment with a lower level of population density; see for example Wolpert, 1966; "Migration as an Adjustment to Environmental Stress"). Stokols notes, however, that such adaptations are not always possible. An individual may be unable to alter his preferences to a point where they are in accord with the population density of his environment, and also be unable to relocate in a lower density setting. In such cases, individuals may manifest symptoms of "general stress", and a "prevailing concern with spatial constraints and the motivation to eliminate them, or reduce their salience" (Stokols, 1972a).

Stokols' perspective on the relationship between density and crowding closely parallels stress-strain models employed by many social and life scientists. Indik et al. (1964), for example, define stress as

> a relationship between a system (either personal or social) and its environment such that adaptive demands placed on the system exceed its normal homeostatic capacities and therefore produce a force toward continuing or permanent change in the system itself.

Strain involves "the forces generated in the system in response to stress" (Indik et al., 1964).

Strain has been viewed as adaptive, insofar as it motivates and directs behaviours that reduce stress, and maladaptive insofar as it does not result in stress-reducing activities (Selye, 1956; Wolff, 1950, 1953).

Strain in humans has been the subject of much investigation by medical researchers, psychiatrists, and psychologists. Generally, strain has been viewed as either physiological or emotional discomfort, or most commonly, a combination of the two.

Selye (1956) and others, for example, have focused on physiological and chemical changes due to stress. Basowitz et al. (1955) and Mechanic (1962) have emphasized an emotional dimension of strain (anxiety, hostility, general unhappiness, etc.). Alexander (1950), Indik et al. (1964), Langner (1962), Langner and Michael (1963), Wolff (1950, 1953) and others have combined these foci by examining psychosomatic symptoms as indicators of strain.

Strain, then, insofar as it has been measured by social and life scientists, is a state of discomfort with both emotional and physiological dimensions.

Stokols (1972b) recognizes that strain has a physiological dimension and a psychological dimension. However, he also delimits two sub-dimensions within psychological strain.

To Stokols, psychological strain involves both "emotional imbalance" and "cognitive inconsistency". The former refers to emotional states that are generally regarded to be undesirable or discomforting, such as feelings of unhappiness, anxiety, and frustration. The latter is the awareness that an individual is in a stressful situation. In the case of crowding for example, cognitive inconsistency would involve an individual recognizing that his separation from others is, in terms of his own desires, inadequate. In such a case, cognitive inconsistency could be manifested by a concern with augmenting the amount of space one has at his disposal.

The concepts of stress and strain have been borrowed from engineering physics by the social and life sciences, and the transition from one discipline to another has not been without difficulty, particularly for the social sciences, where research is almost exclusively post factum in design.

The Handbook of Chemistry and Physics defines stress as "the force producing or tending to produce deformation in a body". Strain is "the deformation resulting from a stress" (Hodgman, 1957). Stress, then, is that which produces strain, and strain is that which is caused by stress.

The interrelationship between the concepts of stress and strain has apparently resulted in a certain degree of

confusing social scientists. Some, for example, fail to distinguish the two concepts at all, and use "stress" to refer generally to both the cause and effect (Levine and Scotch, [illegible]). Other social scientists, who distinguish stress from strain, concentrate on only one of the concepts and give the other residual attention. Basowitz et al. (1955) and Janis (1954), for example, focus on what they consider to be situations involving stress (combat situations and disasters, respectively), and consider associated attitudes and behaviours to be signs of strain. Mechanic (1962), on the other hand, focuses on what he considers to be strain ("the discomforting responses of others"), and attempts to locate the causes (stress).

Neither of these approaches is entirely satisfactory. Basowitz et al. and Janis follow the engineering physicists, and take the position that where there is stress, there is by definition, strain. However, as Levine and Scotch (1970) point out, people vary in their responses to stress, and in any given situation some may experience strain while others do not. One can empathize with Basowitz et al. and Janis insofar as their examples of stress are extreme, and perhaps likely to produce strain in most, if not all,

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[1] Some social and life scientists follow Selye (1956) and refer to the effect as "stress" and the cause as a "stressor". Though different terms are used here, the distinction is made between cause and effect.

people involved in such situations. However, as with density and crowding, less extreme values of the independent variable may interact with other variables to produce discomfort or strain in individuals. The approach taken by these researcher then, in assuming a one-to-one correspondence between stress and strain in humans, particularly in situations of less than extreme stress, seems unnecessarily crude.

Mechanic's approach does not contain the weakness discussed above. However, by focusing on strain, and assuming a one-to-one correspondence with stress, Mechanic is forced into an extreme relativist position. That is, if strain is "the discomforting responses of others" (Mechanic, 1962), all stimuli individuals regard to be discomforting are stressful by definition, and the concept of stress loses its utility.

Stress and strain, then, should be seen as related concepts, but they must also be seen as being capable of independent variation.

Stokols' perspective on crowding as a form of strain allows stress and strain to be viewed as logically related concepts that can vary independently. By viewing the interaction of specific variables with population density as stress, Stokols is in effect stating that under certain conditions (i.e. specific values of the interacting variables), density can be seen as stress, and will produce strain.

Given different values of the interacting variables and/or population density, density may not produce strain and therefore cannot be viewed as a situation involving stress by definition.

CHAPTER III

LACK OF PRIVACY AND STIMULUS OVERLOAD

Density, Lack of Privacy, and Strain

Stokols' (1972a, 1972b) perspective on population density and crowding closely follows Michelson's broader and more sophisticated model of "intersystems congruence".

Michelson (1970) has noted that the congruence between behaviours and physical environments varies. Some behaviours "fit" with some physical environments better than they do others, and some environments are more supportive or facilitative of specific behaviours than others. Thus, certain behaviours and physical environments can be seen in a Weberian sense as having "elective affinities" for one another. Physical environments do not <u>determine</u> socio-cultural

patterns, nor do socio-cultural patterns necessarily affect physical environments.

Some environments fit specific behaviour patterns better than do others. Michelson illustrates this point by referring to an individual who has engaged in "handyman" hobbies while living in a single, detached house, and then moves to multiple-family housing. In the first environment (the house), there is a greater degree of congruence between the behaviour and the setting than there is in the second (the apartment). Houses typically have more space than multiple-family accommodations, and in single, detached houses, there is probably less likelihood of other households being disturbed by the sounds and sights of workshop activities than in multiple-family housing.

Such incongruity is analogous to stress, and the actor can be seen to experience strain, motivating him either to alter his environment (by moving to accommodations that are more amenable to his behaviour patterns) or by altering his patterns. The third alternative is to do neither, and perhaps to experience strain.

From Michelson's viewpoint, then, <u>life style</u> (modal behaviour patterns, or emphasized roles) is as important a variable as the physical environment. It is the <u>interaction</u> of these two variables that affects the level of satisfaction one experiences with his physical environment.

As Michelson has noted, the essential element of population density, insofar as it may affect people, involves the separation of people from others. High density implies low separation, and low density implies high separation. It is the degree of separation of people from each other, in interaction with life style, then, that we should focus on as a potentially stressful situation.[1]

Pressures to restrain one's activities in high density situations need not arise merely to protect the population from excessive stimulus bombardment. Individuals may simply not want others to hear or see their behaviours. That is, many individuals or households may highly value privacy, and feel uncomfortable[2] in situations where others can perceive many of their behaviours. Again, people with more passive life styles have a lower likelihood of being

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[1] Stokols (1972b) points out that one can distinguish "non-social" and "social" crowding. The former refers to discomfort from the interaction of personal and other characteristics with amount of physical space, whereas the latter refers more to the separation of people from others. The two types of crowding may be, and often are, related. Nevertheless they may also vary independently. (Stokols illustrates this point by alluding to a single astronaut, in a cramped space craft with little physical space, but the ultimate in separation from others.) For the present, this study will focus on "social crowding" since it seems more directly related to population density.

[2] Several social scientists take the position that minimum levels of privacy are not only necessary for human comfort on an individual level (Goffman, 1963), but for the functioning of society as well (Merton, 1948; Moore and Tumin, 1949; Simmel, 1950; Schwartz, 1968; Weston, 1967).

seen or heard and may therefore require less privacy than people with active life styles.

Keyfitz (1966) and Raven (1961) point out that high density living may involve a pressure to restrain behaviours and to develop a high level of self-restraint and reserve, in the interest of maximizing the solitude of others. In other words, in many situations of low separation of people from other people, there is a pressure to cut back on stimulus emissions so as not to annoy those around us. In lower density situations, where there is higher separation of people, there is less pressure to restrain oneself, since the stimuli one emits will be weakened by distance or physical barriers, and have less impact on others.

High density living, then, may involve restrictions on our behaviours, and we may be faced with the choice of going elsewhere to pursue our interests, changing our preferred patterns of behaviour, or experiencing strain.

The Importance of Life Style

It is clear from this discussion that if Keyfitz is correct, the most suitable life style for high density living is either a passive, low-key life style, or, if active, a life style that is not home-centred. In high density settings, the active, home-centred life style is more likely

to involve stress, and the individual is more likely to experience strain.

Life styles vary with socio-economic and cultural categories as well as with individual characteristics.

Socio-economic status affects life styles. Fischer (1973), Keyfitz (1966), Kumove (1966), and others note that the higher socio-economic strata are not only better able to avoid high density accommodations in the first place (by being able to afford more space and tending to have fewer children), but are also more likely to sustain life styles which are not home-centred. Individuals who occupy high status positions are better able to "get away from it all" for long or short vacations. Even if high status individuals inhabit high density environments, then, they are able to leave for low density environments where they would have greater freedom to engage in active life styles. From this perspective, socio-economic status, particularly income, represents the opportunity to inhabit a wider range of environments and thereby avoid, either permanently or temporarily, the repression that may characterize high density living.

Not only are members of middle and upper socio-economic strata better able to escape home-centred life styles, but evidence exists that suggests these strata do in fact have more community or city centred life styles (cf. Michelson,

1970:111-130). This is not to say that members of different strata necessarily have different needs, or preferences. Rather, middle and upper status individuals may merely have a wider range of the environment open to them, and appear to spend less time in the immediate vicinity of their homes.

Ethnicity and race may also be related to life style, on the active-passive dimension. Orientals, for example, are typically portrayed as engaging in more passive and restrained styles of behaviour than western caucasians. Whether this is the result of historical and cultural differences, or genetic differences as suggested by Freedman (1974) is uncertain. In any case, Schmitt's discovery that the Chinese population in Hong Kong appeared to suffer few ill effects in a high density environment may derive from the life styles affected by members of the population.

Life styles may also vary within socio-economic and ethnic categories. Individual experiences with high density living in the past could help inhibit the development of an active life style, and thereby better equip one for present and future living in high density environments. People with rural backgrounds, for example are more likely to experience "malaise" in urban areas than are people with urban backgrounds (Fischer, 1973).

It has also been suggested that sex roles involve different life styles, with females traditionally more home-centred, and possibly more passive as well, and life cycle seems also to be related to life style (Kumove, 1966; Michelson, 1970).

Finally, life style may be related to individual psychological characteristics. Petrie (1967) has identified a continuum of "perceptual reactance", ranging from "stimulus seeker" to "stimulus avoider", which seems strongly related to the active-passive dimension of life style.

Perceptual Reactance

From Petrie's perspective, people differ in perceptual reactance. That is, people differ in the level of comfort they feel in a particular environment. Petrie cautions that she is not concerned with thresholds, but with tolerance. Threshold involves the perception of a stimulus, while tolerance involves reactions to the perceived stimulus. Specifically tolerance refers to the "modulation" of perception.

On one end of Petrie's continuum is the "augmenter". An augmenter's nervous system amplifies or augments his perception of stimuli. On the other end of the continuum is the "reducer", whose nervous system filters or reduces his

perception of stimuli. In the centre, between these two poles, Petrie has located "moderates", whose nervous systems neither augment nor reduce their perception of stimuli.

Since Bexton et al. (1954) and others have found that individuals suffer under conditions of acute sensory deprivation, it can be reasoned that people are most comfortable in environments that afford a certain level of stimulation. However, an environment in which an augmenter achieves maximum comfort would involve sensory deprivation for reducers. Because of this, reducers can be characterized as "stimulus seekers".

Petrie has found empirical support for the notion that perceptual reactance is related to the active-passive dimension of life style. Individuals who score toward the augmenter end of the scale are reported to lead more inactive and sedentary lives than reducers and state that they are less often bored or lonely, prefer fewer friends, and desire more sleep than individuals who score toward the reducer end of the continuum (Petrie, 1967:88, 100).

Psycho-physiological factors then, as well as individual background characteristics and membership in socio-cultural categories, seem likely to be determinants of individual life styles and of response to environments.

Density, Stimulus Overload, and Strain

To this point we have examined only one side of the problem of high population density and the alleged pressures against active life styles. Keyfitz (1966) notes that although high density environments may indeed involve pressures to restrain oneself, such is not always the result. That is, high density environments often contain populations that are not only less than restrained, but may in fact be active. The well known Lombard effect, for example, involves a pressure to speak louder and to be more demonstrative in high density settings that involve a lot of activity (e.g. cocktail parties). Any pressures to be restrained in style of life may be more than offset by the Lombard effect. Strain resulting from high population density may therefore be less a function of pressures to repress behaviours, than the result of excessive stimulus bombardment (stimulus overload).

The notion that population density and stimulus bombardment are related is not new. Simmel, writing at the turn of the century, believed that the "intensification of nervous stimulation" was one of the most important by-products of high density urban areas, and that this had definite consequences on the attitudes and behaviours of urban residents (Simmel, 1950). The behaviours and attitudes

resulting from the intensification of stimuli include an increased impersonalization of relationships, and a lack of concern for others manifested by a blase or critical attitude toward people and life in general.

Like Simmel, Wirth (1938) held that urbanism (the attitudes and patterns of behaviour allegedly characteristic of urban residents) is in part the result of interpersonal stimulus bombardment. Wirth believed that the size and cultural heterogeneity of populations in cities combined with high population density to produce "accentuated friction", segmentalized and impersonal relationships, and instability and insecurity.

Both Simmel and Wirth took the position that the high population densities of cities are in part responsible for an increase in socio-psychological distance between people in urban areas. Both sociologists implied that humans are comfortable with a certain level of interpersonal stimuli. A small number of contacts can be intense. However, if their number increases, the intensity of the stimuli must be reduced in compensation. Hence, urban residents are alleged to be involved in fewer primary group relationships than rural residents, because the former are in contact with a greater number of people than are the latter.

Though Simmel and Wirth were primarily concerned with numbers of interpersonal contacts and emotional investment,

their orientation closely parallels a stimulus overload perspective. Milgram (1970) has elaborated and extended the Simmel-Wirth position and explicitly introduced the notion of stimulus overload.

For Milgram, the successfully adapted urbanite is an individual who can ignore or filter many of the stimuli he encounters in his physical and social environment. That is, to be comfortable in high density urban settings, one must selectively perceive environmental stimuli in order to avoid the discomfort of stimulus overload. The highly adapted urban resident will discourage interpersonal contact and appear aloof in comparison with his rural counterpart. The well adjusted urbanite will also be less aware of many sights, sounds, smells, etc. to which a rural resident would be more sensitive. From Petrie's perspective, then, Milgram is in effect saying that reducers are better suited to city living than are augmenters.

There is a measure of empirical support for viewing crowding as a form of stimulus overload. Christian (1960) and Christian et al. (1964) performed autopsies on animals that had prematurely died after being subjected to high density conditions. The causes of death were found to be shock and severe metabolic disturbance, apparently brought on by prolonged activity of the adrenals which had changed radically in size and weight. Esser (1972) and others

point out that hyperactivity of the adrenals is a direct consequence of prolonged and intense excitation of the central nervous system.

Although Hall suggested in 1967 that routine autopsies be performed on people who die in cities in the hope of discovering similar effects, no such research seems to have been undertaken to date.

Using a simulation technique, Desor (1972) found evidence to suggest that "social stimulation" is an important variable intervening between population density and defining a situation as "crowded". The design of the study did not permit any attempt to examine the relationship between crowding and psychological strain.

Research on humans and stimulus overload has dealt primarily with excessive aural stimuli and its effects. Apart from the obvious physical effects of extremely load sounds (e.g. demaged ear drums), a number of studies have shown that aural stimuli can have other deleterious effects on humans.

The intensity, unpredictability, and uncontrollability of sound affect task performance (Broadbent, 1958; Jerison and Wing, 1957; Boggs and Simon, 1968; Berlyne, 1969; Sanders, 1961; Glass and Singer, 1972), and produce psychological and physical strain (Broadbent, 1957; McKennell and Hunt, 1966; Kryter, 1970).

It is interesting to note that the source of sounds may be an important factor affecting the capacity of sound to produce distress in people. Quieter sounds from neighbours may, for example, be more irritating than louder sounds produced by an individual or other members of his household (Farr, 1967). (Farr also notes that sound levels are directly associated with high density environments, and that results of high noise levels include nervous tension, anxiety, and psychosomatic illness.)

Like the relationship between density and crowding, the relationship between stimulus bombardment and discomfort seems to be affected by other variables. For example, culture and life style seem to affect the relationship between noise levels and aperiodicity and complaints (Jonsson et al., 1969; Kryter, 1968).

Hall points out that in Japan visual stimuli seem to be more important than auditory stimuli with regard to the separation of people from other people. In Japan paper walls are frequently used to separate people. These walls block visual stimuli but do not impair the passage of sound waves. According to Hall, the Japanese seem not to be bothered by the sounds of nearby people, though they may share the Western aversion to the sight of nearby people. Whether Orientals have developed cultures that enable them to tolerate greater levels of interpersonal stimulation, or

whether these differences reflect genetic variation between Orientals and Caucasians in unknown. Freedman (1974) reports that Orientals are more tolerant and acceptive of external stimulation generally than are Caucasians and that these different orientations to the environment are found in newborns, suggesting genetic determinism.

Race or ethnicity, then, may affect the relationship between population density and strain in either of two ways. First, some racial and ethnic groups may have passive life styles and subject themselves to relatively low levels of stimulus bombardment, even in moderately high density situations. Second, some racial or ethnic groups may be better able to tolerate stimulus bombardment than others, and for this reason be less likely to experience strain under high density conditions.

In the same vein, life style may affect the relationship between density and strain in either or both of these ways. Individuals who are able to affect away-centred, as opposed to home-centred life styles, may escape any repression associated with high density living, or escape stimulus bombardment by spending time in lower density environments.

Finally, both stimulus seekers and stimulus avoiders could experience strain while inhabiting the same environment, but for different reasons. That is, it is conceivable that

in a given environment, augmenters could experience strain through stimulus overload, while reducers suffer from feeling constrained through a lack of privacy. This seems most likely to happen in situations of moderate density, where the environment affords too little stimulation for reducers and too much for augmenters. In situations of extremely high or low density both reducers and augmenters could conceivably experience stimulus overload and sensory deprivation, respectively.

To summarize, population density seems likely to interact with various factors (which may be related through a common association with life style) on strain. Lack of privacy and/or stimulus overload may act as intervening variables.

Homogeneity

In the first chapter we suggested that the homogeneity of a population may affect the relationship between population density and social pathology. In short, people may feel more uncomfortable in close quarters with people who are in some way or other unlike themselves.

An excellent example of the possible effects of "mixing" different types of people can be seen by focusing on Petrie's augmenters/reducers continuum.

Augmenters' orientation toward stimulus avoidance and reducers' tendency toward stimulus seeking could create problems for populations that are heterogeneous in perceptual reactance.

Petrie (1967) suggests that both augmenters and reducers may experience strain (manifested by psychosomatic symptoms) for opposite reasons. Consequently, an environment that is comfortable for one may be discomforting for the other. If augmenters and reducers are forced to share an environment, or have a low degree of separation from each other, then conflict could result. Augmenters, tending toward stimulus avoidance, may in fact promote the pressures to restrain activities in which reducers want to engage, and reducers' life styles may be the principal source of stimulus overload for the augmenters. To mix augmenters and reducers, then, in situations that involve moderate[3] levels of population density, may be to assure that one or both of these types of people experience strain.

Homogeneity,[4] then, should be included in the model as another exogenous variable that may interact with density in determining strain.

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[3] In situations involving extremely high or low levels of population density it is conceivable that augmenters and reducers would both experience strain from stimulus overload and deprivation. That is, even augmenters can suffer from stimulus deprivation, and reducers from stimulus overload.

[4] "Homogeneity", as used here, refers to the degree to which an individual is similar to those around him in

Three variables will be examined empirically as possible interacting variables with density on strain. These are: (1) life style, a socio-cultural variable, and perhaps on a logical basis the most likely to interact with density on strain; (2) perceptual reactance, a psychological variable; and (3) homogeneity, a demographic variable.

The following model (see Figure 2) can be developed from the preceding discussions. The empirical evaluation of this model will constitute the basis of the present research.

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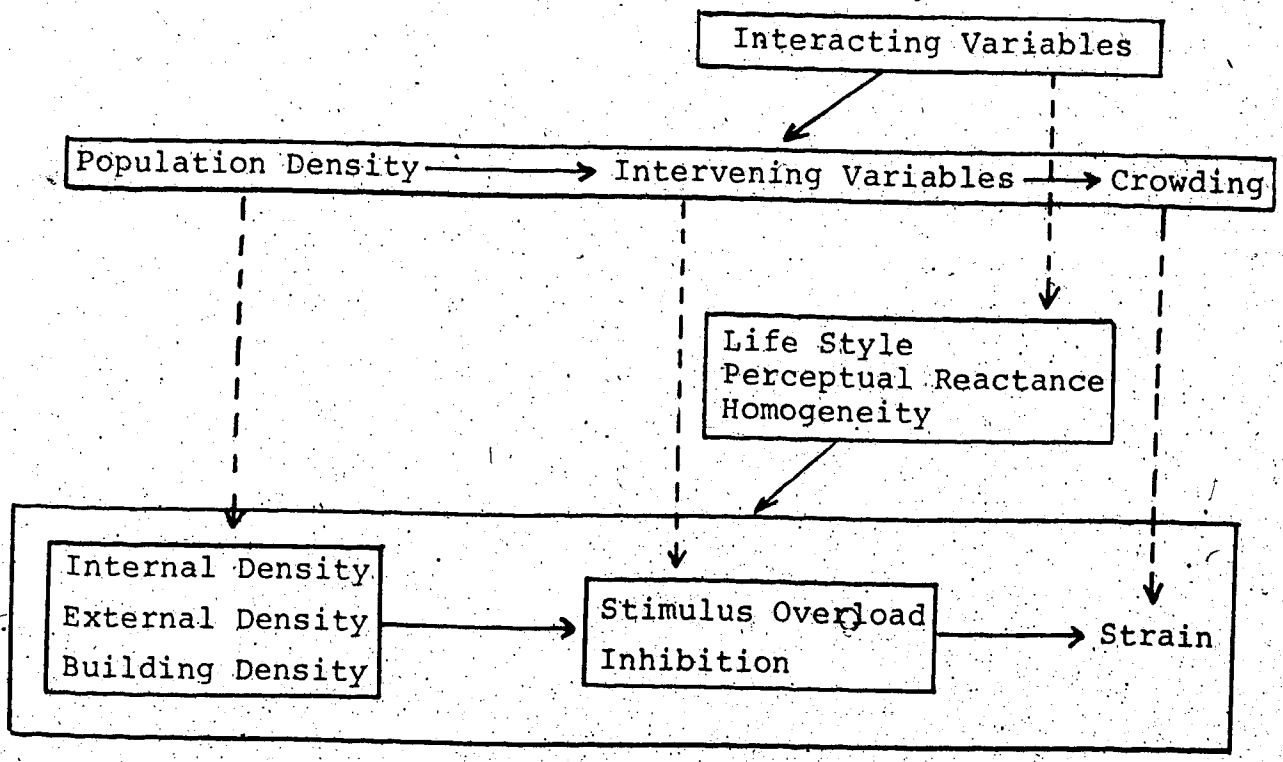
terms of ethnicity, race, SES, life style, or other characteristics.

FIGURE 2

HYPOTHESIZED RELATIONSHIPS BETWEEN POPULATION DENSITY, INTERVENING VARIABLES, INTERACTING VARIABLES, AND CROWDING



Dotted lines represent lines of correspondence.

Solid lines represent relationships.

CHAPTER IV

ELEMENTS OF HIGH DENSITY DESIGN

Building Density

The type of density upon which this study will focus is building density, or as it was called in the first chapter, building type. On the aggregate level of analysis this type of density was found to be the strongest correlate of our two measures of "social pathology", and the data suggest that external density is a consequence of building type, without its having independent effects on the dependent variables we examined.

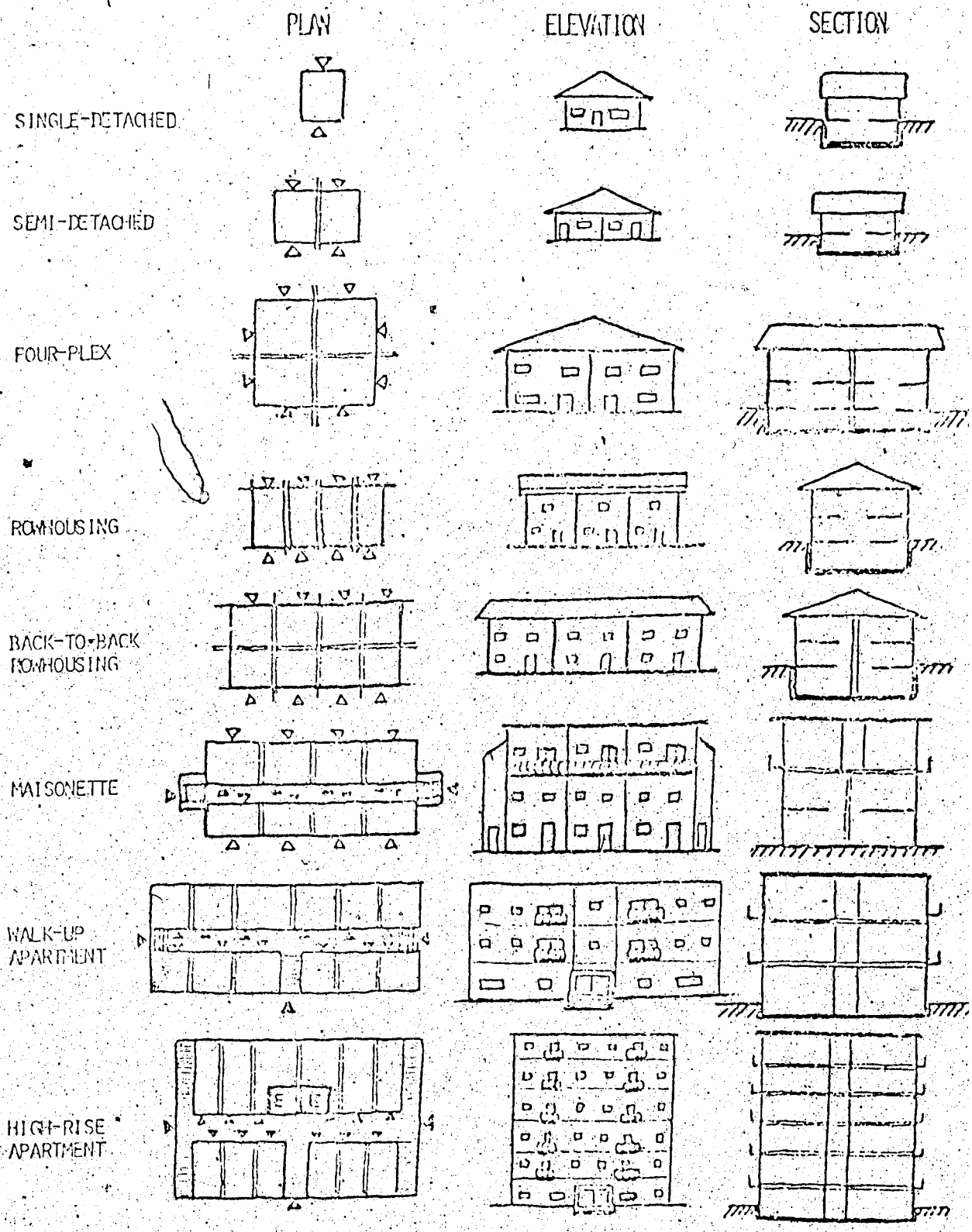
Building density, as defined by Michelson (1970), refers to the number of people or housing units in a structure. In the initial chapter we broadly distinguished dwellings with one housing uint per structure (single, detached houses) from dwellings with more than one unit per structure (multiple-family housing). We noted near the end of the chapter that, although this distinction may be meaningful, it is nevertheless crude, and that there are

several different designs of multiple family structures, many of them reflecting different levels of building density.

"High density housing" to architects and planners refers to structures with high building density. High density structures involve stacking single dwelling units together. The dwelling units can be stacked horizontally, vertically, or both horizontally and vertically.

The principal value of high density housing derives from low land and material costs associated with this type of housing. For example, two adjacent single, detached houses each have four walls, a floor, a ceiling, and usually, an amount of land separating them. A side-by-side duplex (also called "semi-detached" housing) involves one less wall, since one wall is shared by both units, and no land separates the units. Hence, the semi-detached dwelling typically involves a lower per-unit cost than comparable units in single, detached houses. In the case of higher density housing designs, even greater savings in land and material costs are possible. For example, four-plexes (also known as quadriplexes) and rowhouses are horizontally stacked units involving two shared walls per unit (except in the case of end units on rowhouses). Back-to-back row-housing goes still one step further, and centrally located units share three walls (see Figure 3).

FIGURE 3
BUILDING TYPES



The principal benefit of horizontal stacking, then, is lower construction and material costs on a per-unit basis. Land cost per unit may also be lower for this type of high density housing, since the amount of land per unit is typically lower than in single, detached houses.

Though horizontal stacking represents lower per unit costs than single, detached housing, the greatest savings in per unit costs are probably gained in high density designs employimg vertical stacking along with horizontal stacking.

The over-and-under duplex represents the only design where vertical stacking is employed exclusive of horizontal stacking. In this design the ceiling of the lower unit is the floor of the upper unit. There are no shared walls. Other designs involve both shared walls and shared floors/ ceilings, and it is these designs which of course offer the greatest economy in terms of cost per unit.

The maisonette, walk-up, and high-rise designs involve stacking uints both horizontally and vertically. In the case of the maisonette design, there is typically one level of vertical stacking and several levels of horizontal stacking. Centrally located lower units, then, share three walls and the ceiling, while centrally located upper units share two walls with other units, one with a corridor, and the floor with a lower unit.

Walk-ups and high-rises involve more than two levels of vertical stacking. Walk-ups typically involve three or four levels of vertical stacking, while high-rises generally contain more than five levels of vertical stacking. As the name indicates, walk-ups do not contain elevators, while high-rise designs do.

These designs not only involve different levels of building density, but because of the elements of high density design, they vary in several other respects that may interact with some of the factors mentioned earlier to produce strain.

The number of walls, floors, and ceilings shared by units varies by the design of the building in which they are situated. Units in duplexes, for example, all share either one wall (side-by-side design) or the floor/ceiling (over-and-under design). All units in four-plexes, and most units in rowhouses share two walls, most units in back-to-back rowhouses share three walls, and so on, until in the high-rise design we find most units sharing three walls (one wall shared with corridors, two with other units) and shared floors as well as shared ceilings.

Shared Barriers

Building density, then, is related to the number of barriers units share. Single, detached dwellings, with

building density equal to unity, contain units with no shared barriers. Multiple-family dwellings contain units that share between one and five barriers, depending on the design of the building and whether units are centrally or peripherally located within the structure.

Shared barriers may be an important factor with respect to lack of privacy and stimulus overload. The single, detached dwelling, involving units with no shared barriers, can be seen to afford the greatest degree of aural privacy and protection from stimulus bombardment. It is reasonable to conclude that, all else held constant, the number of barriers units share is <u>inversely</u> related to the level of aural privacy and protection from stimulus bombardment units afford their occupants. Shared barriers, then, may be an important component of high density design that <u>interacts</u> with other factors on lack of privacy and stimulus overload. Thus, Fanning's (1967) discovery that apartment dwellers tend to exhibit more psychoneurotic symptoms than house dwellers <u>may</u> be a function of the fact that a high proportion of units in vertically stacked housing have a large number of shared barriers.

Height

Vertical stacking not only increases the number of barriers shared by units (floors/ceilings), but it also affords diminished access to the outside for units situated on upper levels.

Upper-level units are distant from the ground, and, unless the design of the building includes balconies (which are typically very small), the residents of upper-level units have no out-door space at their immediate disposal. While this may be inconsequential for many residents of vertically stacked housing, some residents may find that it does not fit well with preferred behaviour patterns.

The notion that units situated in the upper levels of high-rises afford occupants less access to the outside, and that this in turn may affect individuals' psychological well-being, has been examined by Kumove (1966), Wallace (1952), and others.

As pointed out in Chapter I, Wallace and Kumove have noted that high-rise living may be less suitable for some people than others. Families with children, for example, seem to find high-rise accommodation to be less congruent with their familial roles than other types of accommodation. Specifically, the low degree of access to the outside may impair mothers' ability to fulfill household duties and

simultaneously maintain surveillance over their children when they are playing outside. This could account for Kumove's (1966) discovery that children who are under the age of seven spend more time in their units in high-rises than do their counterparts in low-level housing. By keeping their children inside mothers are able to complete household tasks and know what their children are doing.

The alternatives for mothers in high-rises are to go with their children to supervise their outside play (in which case mothers' housework, inside leisure activities, etc. will be neglected), or to allow their children to play outside unsupervised, where they may engage in behaviours that are delinquent or dangerous to themselves or others.

Keeping children inside, where their activities can be supervised or watched, may involve costs for both mothers and their children. First, large motor activities (running, jumping, climbing, etc.), which are necessary for the development of coordination, will probably be discouraged by mothers when their children are in their units in an apartment building. Apart from possibly impeding the development of their children by discouraging such activities, parents may also be preventing their children from "blowing off steam", and engaging in energy-releasing activities. The situation that may emerge, then, is one of frustration and conflict for both parents and their children (Willis, 1955).

Though the foregoing is speculative, it is not unreasonable, and there is a measure of empirical support. Couples with small children, more than people at any other stage of the life cycle, desire to live in single, detached houses (Housing and Urban Development Association of Canada, 1971; Michelson, 1967). More direct empirical support can be found in Fanning (1967). Fanning found that rates of neuroses were directly related to the distance occupants' units were from the ground. Further, women without small children living with them in their apartment units were found to have lower levels of psychoneurotic illness than their counterparts with small children.

Clearly, vertical, or for that matter, horizontal stacking may affect people for any number of reasons apart from the ones discussed above.[1] Individuals who enjoy gardening, or other outdoor activities requiring a certain amount of private space, for example, may find that high-rise living involves strain. There are numerous environmental

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[1] Some of the differences between multiple-family housing and single, detached housing that respondents have defined as important, include private entrances, adjacent parking, and more space (both inside and out) associated with single, detached houses (Centre for Urban and Community Studies, 1970). In addition, many people may have a strong preference for single, detached dwellings because this type of dwelling represents their notion of the "ideal" (Audet, 1970). Disjunction between one's conception of an ideal environment and the environment in which he resides may in fact be an important source of strain, regardless of how well his present environment may fit his preferred patterns of behaviour. See Michelson (1970) on "mental congruence" and Fischer (1973) on "idealized communities".

characteristics that vary with vertical stacking that may interact with other factors to produce individual strain. Our intention here, however, is not the discovery of what it is about vertical stacking that may have deleterious effects on particular people, but to see whether vertical stacking is indeed related to individual strain when controlling for shared barriers.

CHAPTER V

THE RESEARCH DESIGN

In Summary

Before discussing the design of this study, the sample, and measurement problems, it will be helpful to summarize our thoughts.

In Chapter I we noted that population density has been viewed as a cause of "social pathology" by many social scientists. Data both support and refute this contention.

We suggested that the ambiguity surrounding the question of whether population density causes social pathology could be due to any of several factors.

First, "social pathology" is such a broad and vague concept, that a multitude of indicators have been employed by researchers. Some of the indicators of "social pathology" may be correlates of population density while others are not.

Second, there are several types of population density, each with its own implications for humans. Though we found building type (building density) to be a stronger correlate of our indicators of "social pathology" than either internal or external density, the different types of density may vary in their importance as predictors of different indicators of "social pathology".

Third, whether a particular type of population density is related to any specific indicator of "social pathology" may depend on other variables. That is, one or more variables may affect the relationship between population density and "social pathology". It should not be assumed, then, that high population density determines "crowding" in the same way for all individuals or social categories. In view of this, studies that have found a particular type of population density to be unrelated to a specific indicator of "social pathology" may have had a high proportion of "density resistent" people in their samples, while studies finding the same type of density to be correlated with the same dependent variable may have had a high proportion of "density susceptible" people in their samples.

In view of the problems associated with the concept of "social pathology", we elected to examine a more specific effect of population density. We therefore focused on

crowding as a dependent variable, and embraced Stokols' (1972a, 1972b) viewpoint on crowding as a type of strain.

In the third chapter we pointed out that several factors could reasonably be expected to affect the relationship between population density and strain. Of these, life style appeared to be contral.

In examining the implications of population density for humans we noted two factors that could intervene between density and crowding. These were stimulus overload and lack of privacy.

Finally, because building density was the strongest correlate of our measures of "social pathology", and the fact that relatively little attention has been given to this variable as a type of population density, we elected to examine the elements of high density building design and their implications for strain.

The elements of high density design upon which we focused were vertical and horizontal stacking, and the specific variables we isolated as possible contributors to strain were shared barriers and height.

As is clear from the preceding summary, our research interests involve an exploration of the relationship between population density (in particular, building density) and discomfort with it. Specifically, we are concerned with some of the conditions under which density may be experienced

as strain, and some of the elements of high density living which may be responsible, in these instances, for strain.

In view of the nature of our research interests, the most appropriate research design for our study is the experiment. An experimental design would enable us to eliminate the possibility of spurious interpretations, and allow us to easily determine whether high density living produces or attracts individuals who suffer from psychological strain. However, given our interests, available resources, and some inadequacies of laboratory research, an experimental design is not feasible.

Density, Exposure Time, and Crowding

One of the problems facing experimental researchers who are concerned with human subjects involves time. For practical as well as ethical considerations, experimental research on humans has been for the most part confined to locating short-term effects of short-term exposure to experimental variables. While the experimental researcher may gain from being able to manipulate his experimental variables and demonstrate causal relationships, the scope of his research is often, of necessity, limited.

In the case of research on the effects of density on humans, these limitations may be serious. Experimental

research has been confined to demonstrating the short-term effects of short-term exposure to very high levels of internal density. The levels of population density are often extreme in comparison with field conditions, and the exposure time is short. Clearly, short-term exposure to high density conditions may have different effects on people than long-term exposure to more moderate levels of population density (Gad, 1974). The former is analogous to a sudden shock, while the latter involves a more drawn out and possibly wearing situation. Whether people find it easier to cope with sudden and extreme population density or long-term moderate levels is unknown since very little research has been done on long-term stimuli generally, and long-term exposure to different levels of population density in particular.

Short-term experiences with high density are not necessarily discomforting. Many human recreational activities take place in high density settings (e.g. sports arenas and theatres). For at least a sector of the population, then, any discomfort from short-term exposure to high density seems to be more than balanced by other considerations.

In view of the foregoing, and the present impracticality of attempting an experiment involving building density, this study will focus on the possible effects of long-term exposure

to population density. This research then, involves a post factum design.

There are several costs associated with taking this approach. First, we will be unable to state with confidence that one factor is causing variation in another. However, we will be able to separate non-causal relationships from "possibly" causal relationships and deflect further research (especially experimental research) toward the latter. In addition, we may be able to predict a significant amount of the variation in crowding by having knowledge of other variables, and this could prove to be of value in an applied sense.

A second major disadvantage of post factum designs is the lack of control the researcher has over his independent variables. That is, the researcher must "make do" with the amount of variation he finds in the field. If his independent variables do not vary, or vary to only a small degree, correlations with dependent variables will be small. However, by employing stratified sampling procedures and weighting the strata accordingly, the survey researcher can maximize the variance between strata at the expense of the variation within (Moser, 1969). In this way the possibility of inadequate variation in the independent variables can be reduced though not eliminated.

The Population

The data for this research were collected in the summer of 1974 in conjunction with the Alberta Housing Study directed by Dr. E.L. Snider. The population for the Alberta Housing Study includes the residents of 8,977 dwelling units in 91 government-supported housing projects in Edmonton and Calgary, Alberta. All building designs shown in Figure 4 in the preceding chapter are represented in these projects.

The residents of government-supported housing are an ideal population for the study of population density and strain. Government-supported housing in Edmonton and Calgary includes a wide range of housing designs, from single, detached to high rise. This, combined with the fact that residents of government-supported housing must qualify for residence under a maximum income restriction, is important.

In a recent examination of the literature concerning the possible effects of population density, Fischer et al. (1974) note that many studies of population density are severely hampered by multicollinearity between measures of density and measures of socio-economic status. In particular, Fischer and his associated point out that the Galle (1972a) research suffers from this defect.

Multicollinearity is problematic because in removing the covariance between two highly correlated independent variables, as one does in estimating partial slopes, one is left with a residual variance in his independent variable that is very small relative to the total variance of the variable. The effect of this is that very small differences in total correlations between the dependent variable and the independent variables are overstated by the partial slopes. Hence, the importance of random error becomes great. Neither total r^2's nor tests of significance are affected by multicollinearity, but estimates of the relative strengths of the independent variables as predictors are (cf. Johnston, 1963; Blalock, 1972; Hartnagel, 1974).

Fischer et al. note that internal and external density are usually very highly correlated with socio-economic factors, and that efforts to separate the independent predictive powers of these three variables on another variable, is very likely to result in inflated and distorted relative differences between partial slopes.

Building density is also very highly correlated with socio-economic factors. Home ownership has in fact often been used as an indicator of socio-economic status. A great problem in conducting research involving housing could then be high correlations between socio-economic status and design.

The value of using government-supported housing projects as a setting for research concerning these three types of population density may be not only desirable, but essential. The wide range of building and project designs assure variation in building and external density, and the limited range of tenants' incomes should guarantee a minimal correlation between these types of population density and socio-economic factors.

Although the Alberta Housing Study includes all appropriate projects funded under Sections 15, 40 and 43, and 58 of the National Housing Act (public housing, limited dividend housing, and experimental or condominium housing, respectively), the present research encompasses only those projects funded under Sections 40 and 43 (public housing). The narrowed scope of this research has been determined by the availability of the data. The Alberta Housing Study was undertaken in stages, with the data on public housing collected first. At present, the data on limited dividend and experimental housing are unavailable.

By focusing on government-supported housing, and public housing in particular, we are of course severely limiting the extent to which any of our findings can be generalized. However, if our findings have any practical import, there is perhaps a greater likelihood of affecting social policy with respect to public housing than if the study were more widely focused.

Public housing has become an important issue in Canada. The Canadian Task Force on Housing reported that were it not for three projects out of the many they visited where tenants seemed content, they would see little future for public housing in Canada. As it is, the Task Force held that little confidence could be placed in the methods they used to collect their data, and suggested that more rigorous research would be required before any decision could be made with regard to the future of public housing in Canada (Federal Task Force on Housing, 1969).

By examining public housing tenants' levels of discomfort and relating discomfort to density, design, and life style, this study may provide information that could assist[1] policy makers regarding the future of public housing, optimum high density designs, and "fitting" particular types of people with particular dwelling designs.

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[1]Because of our inability to demonstrate cause, any recommendations must be framed with great care. In fact, any recommendations that arise from this study, or any ex post facto analyses, should take the form of stating that X is not the cause of Y. For example, if the residents of maisonettes experience little or no discomfort, we can be confident in stating that maisonettes do not cause discomfort. On the other hand, if the residents of high rises experience discomfort we cannot conclude that high rises create discomfort since the association of the design type with discomfort may be merely a necessary, but not a sufficient characteristic of a causal relationship (Nettler, 1970).

The Sample

The design for the Alberta Housing Study sample was carefully undertaken. The unit of analysis was the dwelling unit, and it was necessary for the purposes of the study that the proportion of all dwelling units of particular building design in the population be reflected by the sample. For example, the largest proportion of the total number of dwelling units in Edmonton and Calgary are in rowhouses. Therefore, the largest proportion of dwelling units selected for the sample were also in rowhouses.

An equally important consideration was to assure an adequate degree of variation in building design. If the sample were selected merely on the basis of proportional representation, some designs would be scarcely represented in the sample, while other designs, such as rowhousing and back-to-back rowhousing, would comprise the bulk of the sample. In view of the interest in proportional representation and the importance of ensuring adequate variation in the independent variable, a sliding scale was developed whereby units in designs that are numerous, were under-sampled, and units in designs that are less numerous were over-sampled. The result was a sample that reflected, in an ordinal sense, the proportions of the design types in the population.

An additional proviso was that no less than 100[2] units from any particular design appeared in the sample. This assured adequate representation of all designs.

It should be emphasized that in developing this sampling procedure it was impossible to assure a comparable representation of the nine building designs for each funding program, because to some extent funding programs and designs were related. For example, neither Edmonton nor Calgary contained any high-rise buildings funded under Section 58 (experimental or condominium housing), and there were no buildings of the "stacked" design funded under Section 15 (public housing). Consequently, to meet the quotas of the total sample, it was necessary to have designs funded under one section of the act over-represented, while others were under-represented.

Finally, it was decided to include residents of all 91 projects in the sample, to guard against the possibility of specific "project effects" introducing a bias into the total sample.

The sliding scale was applied in each project for each design type represented on that project. A minimum of six dwelling units for each design type on each project was

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[2] An exception here is the single, detached house. The population included only 20 single, detached dwellings, and only 16 of these were occupied. All of these are included in the sample.

selected insofar as it was possible. (Occasionally less than six dwelling units of a particular design would exist for a given project. In such cases all of these dwelling units were included in the sample.)

Using the system outlined above, we calculated the number of dwelling units to be selected from each design represented in each project. Then, with the aid of site plans and visits, a systematic sample was drawn from each design type for each project.

The sample was selected with the dwelling unit as the sampling unit. Names of tenants were acquired from the Housing Authorities, city directories, and in some cases from mail boxes. Respondents were then sent one of the letters (Appendix A and B) explaining the purpose of the study and emphasizing its non-investigatory nature. Respondents were assured that the study was not concerned with family income and that their answers would be treated as confidential.

Respondents were motivated to participate by emphasizing that their responses could have an effect on their housing, and perhaps the future of government-supported housing in Canada. An additional motivation involved a lottery, with cash prizes ($100.00 first prize) for each city, drawing to be held after the completion of all the interviewing.

Thirty interviewers were hired and given extensive training, an office was opened in Calgary, and a supervisor hired, and the instrument was pretested. Finally, the interviewers were given the names of respondents who had received covering letters from Dr. Snider and the directors of the Public Housing Authorities, and the interviewing began.

For the public housing sample, 556 units were selected. This resulted in 442 completed interviews. Subtracting respondents who had moved, the response rate was just under 90 percent.[3] The frequencies of design types appearing in the sample are shown in Table 4.

Measurement

We attempted wherever possible to obtain a number of measures of concepts since the use of multiple indicators allows estimates of reliability. Unfortunately, we were limited by the fact that the Alberta Housing Study had to cover an extremely wide range of questions, so the interview schedule became very long. (After extensive reductions in the number of questions the final schedule still took an average of 145 minutes to complete.) Since the Alberta

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[3] For a more detailed account of the procedures surrounding sampling and data collection, see Snider (1974a

TABLE 4

Frequencies of Design Types in the Sample

	Absolute Frequency	Relative Frequency (Percent)
Single Detached	14	3.2
Semi-Detached	95	21.5
Four-Plex	20	4.5
Rowhousing	101	22.8
Back-to-Back Rowhousing	61	13.8
Stacked Rowhousing	14	3.2
Maisonette	31	7.0
Walk-Up Apartment	27	6.1
High-Rise Apartment	78	17.7
Missing Data	1	.2
	442	100.0

Housing Study was exploratory in nature, we were often forced to reject questions providing an additional measure of a concept in order to retain single measures of others. Further, the length of the interview schedule also militated against the use of different measurement techniques. For example, the use of projective techniques would have provided an independent measure of some concepts (notably perceptual reactance) and would have allowed estimates of validity (Campbell and Fiske, 1959). However, it was felt that such measures would further burden already overburdened respondents. This study, then, was confined in its measurements to a multitrait, single method approach.

Respondents were encouraged to give honest answers to questions through assurances of confidentiality, and by being told that the results of the study could have an impact on their housing projects, government-supported housing in Alberta, and possibly in Canada generally (see Appendices A and B). In addition, interviewers received extensive instruction on probing discrepancies in answers and assessing the accuracy of responses.

Though efforts were made to assure the honesty of respondents, this study relies for the most part on dependent measures of concepts. One danger in doing this is of course, the possibility of response sets biasing results. Items for testing for response sets exist, but they offer no

guarantee that respondents' answers on the response set items will be congruent with respondents' answers on other items. This, and the length of the interview schedule, militated against the use of social desirability response set items. Apart from measures of population density, then, the variables in this study involve the reports of respondents' sentiments and behaviours, and will be treated as such, rather than as direct measures of the behaviours themselves.

Indicators

Population Density and Design Factors.

(1) Internal Density. This variable was computed by dividing the number of bedrooms in a dwelling unit by the number of people normally occupying the unit. Respondents were asked during the interview to indicate the latter, and were contacted at a later date for verification. The Edmonton and Calgary Public Housing Authorities provided information on the number of bedrooms for each unit. Additional information on the floor area of each dwelling unit was unavailable.

(2) External Density. In the first chapter our measure of external density was number of persons per acre by census tract. Though this measure is consistent with measures used in nearly all previous research on population

density, persons per acre by census tract is an inappropriate measure for the present study, where the unit of analysis is the individual. In an effort to minimize the problems associated with using measures involving different levels of analysis, then, we used as a measure of external density number of persons per acre by housing project rather than by census tract, as we did in the initial chapter.

Although using the housing project rather than the census tract as the unit of analysis reduces the probability of ecologically falacious findings, problems of aggregation-disaggregation may still exist. Further, if correlations involving our measure of external density and other measures at the individual level of analysis are affected by problems of aggregation-disaggregation, the effect will be inflationary (cf. Hannan, 1970). In view of this, correlations involving external density and variables at lower levels of analysis must be interpreted with care, since these correlations may be artificially high due to aggregation-disaggregation effects.

Information on external density was provided by the Edmonton and Calgary Public Housing Authorities.

(3) Building Density, Shared Barriers, and Height. In the first chapter our measure of building density was proportion of multiple-family structures by census tract. However, for the present study we used number of dwelling units per structure as an indicator of this concept. This

measure has greater face validity than has proportion multiple-family housing and involves the individual level of analysis. Michelson's (1970) concept corresponding to building density is number of people per structure. Since we were unable to obtain information on number of people per structure, we used number of units per structure as a measure of building density.

Information on building density, shared barriers, and height was obtained from the Edmonton and Calgary Public Housing Authorities and observations of blue prints, structures, and dwelling unit locations.

Socio-Economic Factors.

Four measures of socio-economic status were taken. These were: (1) Employment Status (coded, 1 = unemployed, 2 = employed part-time, 3 = employed full-time); (2) Educational Level Attained; (3) Socio-Economic Status - occupations were given values from the Duncan index (1961); (4) Income - because the respondents for this study are all residents of public housing, and public housing is characterized by having rents assessed on the basis of residents' incomes, we were able to use rent as an ordinal measure of income. According to the Director of the Edmonton Public Housing Authority, the incomes of public housing residents are checked twice a year, and less than ten percent of these people have been found to have misreported their family income.

Strain.

Most research on strain has focused on psychological strain, conceptualized as an anxiety and, probably due to the influence of Selye, measured with a checklist of psychosomatic symptoms. More recently, demographers have employed a more specific concept, environmental strain, conceiving of it as environment or residence-related discomfort which functions as a motivation for migration (cf. Wolpert, 1965; Brown and Moore, 1970; Speare, 1974).

(1) Psychological Strain. As a measure of general strain, an index of psychological strain developed by Indik et al. (1964) was used. This scale, containing a checklist of 16 psychosomatic symptoms, was found by its developers to have a split-half reliability of +.85 and to discriminate on demographic variables. In view of these points, we selected the Indik et al. scale over the more widely used Langner (1962) scale.

Questions 44a to 44q on the interview schedule (Appendix D) contain the items from the Indik scale.

(2) Environmental Strain. As a more specific measure of strain, respondents were asked to report their level of general satisfaction with their housing environment (question 83), whether they had plans to move (question 117), and the extent of the regret they thought they would feel if they were leaving (question 100). These three items were

recoded appropriately, given equal weighting, and combined as a measure of environmental strain. The reliability of the measure, based on Cronbach's (1951) alpha, a measure of internal consistency, is .704.

Perceived Similarity of Neighbours.

The measurement of the homogeneity of housing projects was problematic. First, projects homogeneous on one variable, could be heterogeneous on another, and there is no way of knowing which variable is more likely to interact with population density on strain. Second, the unit of analysis for this study is not the project. A measure of project homogeneity, then, involves a different level of analysis and assumptions concerning random distribution of like and unlike families.

To overcome these problems, respondents were asked whether they perceived their families to be similar to or dissimilar from the other families on their project (question 223). If respondents reported a perception of dissimilarity, they were asked to specify in what ways they believed themselve to be different (question 224). Respondents were classified as reporting a perception of dissimilarity only if they reported perceiving their family to be dissimilar from other families in the project, and were able to indicate at least one specific reason for this perception. Respondents failing

to indicate a reason for perceiving dissimilarity were dropped from analyses involving this variable. By taking this approach we are not only able to locate potentially important areas of homogeneity, but provide a check for the question pertaining to perceived similarity-dissimilarity.

Perceptual Reactance.

Petrie's method for measuring perceptual reactance involves a rather lengthy procedure in which subjects are blindfolded and asked to estimate, through touch, the size of several wooden blocks they are handed. Augmenters are inclined to overestimate the measurements of the blocks, while reducers tend to underestimate these measurements.

Since we had neither the blocks nor the time required to use Petrie's approach, we were forced to develop an alternative way of distinguishing augmenters from reducers. The procedure used was to develop one question with face validity for perceptual reactance, and to use this item as a criterion for the inclusion of other items in a scale. The criterion was "Are you the type of person who is bothered by the noises of other people?" (question 185).

Other potential measures of perceptual reactance were obtained by noting many of the correlates of perceptual reactance reported by Petrie and developing questions based on these variables. These questions included items on

incidence of finger-nail biting (question 44p), amount of cigarette smoking (question 45), hours of sleep normally required (question 47), loneliness (question 48), boredom (question 49), preferred number of friends (question 52), and the degree to which privacy was valued (question 187).

Unfortunately, only three of these items were positiv correlates of each other and the criterion. These were hours of sleep required, number of friends preferred, and value placed on privacy. The intercorrelation of these variables with the criterion is very low, with an alpha = .32

With such a low inter-item reliability, one can place little confidence in this measure of perceptual reactance. Nevertheless, in the hope of locating a degree of predictive validity, this item will be included in the analysis.

Life Style.

In order to measure life style, we borrowed items from Michelson (1967) and added several of our own to produce a list of 24 activities, of which about half are home-centred and half are away-centred (see question 204, a to x). Both home and away-centred activities were factor analyzed, using quartimax rotation to accentuate differences between factors (Rummel, 1970). Items loading weakly on any factor were discarded, as were items loading moderately on more than one factor.

This factor analysis produced the following factors: three home-centred, and two away-centred.

	Factor Loadings
(1) Home/Social - 46.4% of the variance	
a. playing cards or other table games	.266
b. having a few people in to visit	.420
c. listening to the stereo	.362
d. having large parties	.417
(2) Home/Outside - 22.7% of the variance	
a. outdoor hobbies like gardening	.413
b. cooking outside	.644
(3) Home/Hobbies - 18.7% of the variance	
a. indoor hobbies like knitting or sewing	.517
b. drawing or painting	.270
c. workshop activities	.336
(4) Away/Informal - 64.8% of the variance	
a. going to movies	.326
b. going to the park or the zoo	.444
c. going out to visit	.459
d. going for walks or drives in the car	.602
e. going on picnics	.661
f. going fishing, hunting, or camping	.538
(5) Away/Formal - 23.9% of the variance	
a. attending special lectures or classes	.397
b. participating actively in formal organizations	.587
c. participating actively in volunteer work	.622
d. going to church	.355

The variables within each of these clusters of activities were combined as measures of reported role emphasis, or life style. The items in these measures were given equal weighting.

Stimulus Overload and Inhibition.

Unfortunately, we used only single-item indicators for stimulus overload from neighbours and fellow household members, and inhibition due to the presence of neighbours and fellow household members.

(1) Stimulus Overload - Unit

When you are in your own unit, how often can you see or hear the activities of other people in your unit? (Question 156)

(2) Stimulus Overload - Neighbours

When you are in your unit, how often can you see or hear the activities of your neighbours? (Question 154)

(3) Inhibition - Unit

How often do you feel you have to do things more quietly, or not do them at all, because you are afraid of disturbing other people right inside your unit? (Question 160)

(4) Inhibition - Neighbours

How often do you feel you have to do things more quietly, than you would like, or not do them at all, because you are afraid you may disturb your neighbours? (Question 158)

All of these questions contained with them four response categories, ranging from "never, hardly ever" to "very often, always".

In general, the reliabilities of the multiple-item indicators are not high. Because of this, we must expect correlations involving multiple-item indicators to be low, since the usual effect of low reliabilities is the attenuation of correlations. (Bohrnstedt, 1970). In view of the fact that some of the reliabilities are so low, correction for attenuation could more than double the size of correlations between measures of uncertain validity. Therefore, we will not attempt to correct for attenuation. Instead, the low correlations that will undoubtedly emerge from this study will perhaps be viewed with a certain degree of tolerance, inasmuch as they reflect the quality of measurement as well as the relationships between concepts.

CHAPTER VI

DENSITY AS A PREDICTOR OF STRAIN

The principal reason for confining the focus of our survey to residents of public housing was to avoid problems of multicollinearity between measures of socio-economic status and measures of density. However, as with many benefits, there are associated costs. In this case the cost is a limited variance in internal density, due largely to the Public Housing Authority's efforts to maintain internal density at one person per bedroom. Thirty percent of our respondents live in dwelling units with an internal density of one person per room. Internal density ranges from .33 (three persons per bedroom) to 1.50 (two persons per three bedrooms), but the mean is .760 with a standard deviation of only .204, thanks largely to the clustering at 1.00.

The variance in external density and building density is much greater than in internal density. The housing

developments in our sample ranged in external density from 42 persons per acre to 439 persons per acre, with a mean of 107.558 and a standard deviation of 84.904. Building density ranged from 1 unit per structure to 210 units per structure, with a mean of 30.152, and standard deviation of 56.037.

Though the variance in internal density was limited by the nature of our population, our goal of avoiding multicollinearity between population densities and socio-economic factors was realized. As can be seen in Table 5, the highest correlation between our measures of SES and density is -.165 between internal density and household income.

Table 6 shows the zero-order correlations between internal, external, and building densities.

Internal density is weakly correlated with external and building density, and external density and building density are moderately correlated, $r = .410$. Since none of these correlations is inordinately high, we will be able to assess the relative strengths of each type of density as independent predictors of other variables.

In the first chapter we assumed that building density and building design or type would be highly correlated, and based on this assumption we used building type as an indicator of building density. To test this assumption we

TABLE 5

Zero-Order Correlations* Between Three Indicators of Socio-Economic Status for Head of Household and Types of Density

	Internal Density	External Density	Building Density
Employment Status	.036	-.064	-.021
Education	.082	.027	.065
SES - (Duncan Index)	-.100	-.024	-.060
Income - (Household)	-.165	-.129	-.132

*Pairwise deletion of cases involving missing data was used in this analysis and in all subsequent analyses of data.

TABLE 6

Zero-Order Correlations Between Internal, External, and Building Densities

	Internal Density	External Density	Building Density
Internal Density	X		
External Density	.207	X	
Building Density	.165	.410	X

listed the different design ypes in the present sample as a variable, ranging from single detached to high-rise, as illustrated in Chapter IV. We treated this variable as an interval variable[1] and regressed it on building density. The zero-order correlation of $r = .790$ strongly supports our assumption.

Neither external density nor building density is a correlate of psychological strain, though there is a weak positive relationship between internal density and the dependent variable.

As table 7 also shows, neither internal nor external density is a correlate of environmental strain and building density is a weak correlate of this dependent variable.

The relative independence of the three types of population density is reflected by the fact that the beta weights of the three types of density on the two dependent variables do not differ markedly from the zero-order correlation coefficients.

It is worth noting that psychological strain and environmental strain are not only weak correlates ($r = .078$),

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[1] Clearly this variable is nominal, not interval. However, the consequence of treating design as an interval variable in a regression equation has the effect of biasing correlations and slopes in the conservative direction (Boyle, 1970; Labowitz, 1967; 1970). That is, any correlation coefficient or regression coefficient involving such a variable will understate its relationship with another variable.

TABLE 7

Zero-Order Correlations and Beta Weights,[1] Psychological and Environmental Strain on Internal, External, and Building Densities[2]

	Psychological Strain		Environmental Strain	
	r	b	r	b
Internal Density	.116*	.115*	.000	-.038
External Density	.002	-.017	.033	-.040
Building Density	.031	.013	.166*	.190*

*$p \leq .05$

[1]Partial standardized slopes.

[2]All six relationships were tested for nonlinearity, and in all cases were linear in form.

but that one is a correlate of internal density, while the other is a correlate of building density. This may indicate that the discomfort individuals experience from internal density is a more diffuse distress, while the discomfort from building density is more specific and focused.

Through Table 8 we can see that socio-economic factors have no effect on the relationships between internal density and psychological strain or on building density and environmental strain. However, socio-economic factors do appear to be direct correlates of the dependent variables (employment status and strain, and education and environmental strain).

Boyand (1974) and others have noted that household size, rather than density may affect people. Since household size is a component of internal density, it may be responsible for many, if not all of the alleged "effects" of population density. In view of this we included number of children and number of adults along with the three types of population density in regression equations for both psychological and environmental strain. The results appear in Table 9.

Though the introduction of the household size variables indeed reduces the beta weight for psychological strain on internal density, this reduction is very small. Other types of density are similarly unaffected by the introduction of the control variables.

TABLE 8

Zero-Order Correlations and Beta Weights Between Population Densities, Selected Measures of Socio-Economic Status and Psychological Strain and Environmental Strain

	Psychological Strain		Environmental Strain	
	r	b	r	b
Income	.082*	.111*	-.043	-.024
Employment Status	-.190*	-.150*	.015	.019
Education	-.057	-.055	.112*	.102*
SES - Duncan Index	-.176*	-.062	.046	-.051
Internal Density	.116*	.136*	.000	-.053
External Density	.002	-.018	-.033	-.038
Building Density	.031	.020	.166*	.183*

*p $\leq$ .05

TABLE 9

Zero-Order Correlations and Beta Weights for Psychological and Environmental Strain on Three Types of Population Density, Number of Children and Number of Adults in Household

	Psychological Strain		Environmental Strain	
	r	b	r	b
Internal Density	.116*	.103	-.001	-.027
External Density	.002	-.007	.033	-.054
Building Density	.031	.020	.165*	.180*
Number of Children, Household	-.024	.053	-.075	-.096
Number of Adults, Household	-.121*	-.063	.054	.079

*$p \leq .05$

Since building density is in itself a measure of household size, and since there is no real covariation between external density and either dependent variable to be "explained away", other controls for size (e.g. project population) need not be examined.

Given the range and variance of our variables, and other idiosyncrasies which may be associated with our population, the preceding analysis indicates that:
(a) Persistent relationships exist between some types of population density and some indicators of strain, but
(b) if the relationships are causal (association being only one of the criteria social scientists use for attributing cause), the causal impact of density on these variables is weak.

The next phase of the analysis involves an attempt to specify some of the conditions under which density is a more powerful predictor of the dependent variables.

Life Style

In the preceding chapter we isolated five general life styles, three home-centred, and two based on activities away from home. Table 10 illustrates the relationships between these life styles and population densities.

TABLE 10

Zero-Order Correlations and Beta Weights, Between Life Styles on Population Densities

	Internal Density		External Density		Building Density	
	r	b	r	b	r	b
Home/Social	-.069	-.040	.008	.085	-.151*	-.177*
Home/Outdoors	-.107*	-.046	-.246*	-.164*	-.264*	-.187*
Home/Hobbies	-.059	-.044	-.061	-.033	-.079*	-.056
Away/Informal	-.055	-.059	.012	.015	.004	.011
Away/Formal	-.089*	-.074	.025	.015	-.086*	-.076

*$p \leq .05$

Building density, external density, and internal density are significant negative correlates of Home/Outdoors. This may indicate that either the inhabitants of high density environments tend to be thwarted in their desires to engage in home-centred outdoor activities, or people who tend not to indulge in these activities opt for high density living arrangements.[2] In any case, the three types of population density, especially building density and external density, are significant negative predictors of the home-centred outdoors life style.

Another significant correlation exists between Home/Social and building density. This correlation, also negative, may indicate a lack of "fit" between this type of density and the Home/Social life style as well.

Finally, weak negative correlations are found between the Away/Formal life style and internal and building densities.

Though most of the correlations are very weak, it is noteworthy that 11 of the 15 are negative and that the strongest positive correlation is .025 (Away/Formal and external density). Overall, then, the notion that population density inhibits activity receives a small measure of empirical support.

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[2]Another interpretation, of course, is that the associations between these variables are spurious.

Interaction of Life Style on Strain

The relationship between life style, population density, and strain is best viewed for analytic purposes as a problem involving statistical interaction. That is, the relationships between population density and strain may vary with variation in life style. For example, population density may be directly related to strain for individuals favouring a Home/Hobbies life style, and unrelated to strain for individuals who tend not to engage in home-centred hobbies.

In order to examine empirically the relationship between population densities, life styles, and the interaction of these factors on strain, "dummy variables" were constructed to represent the interaction term of each life style with each type of density.

The construction of dummy variables representing interaction terms involves several steps. First, one of the interacting variables (in this case life style) is dichotomized into high and low values (here the dichotomies are based on the mean score). Second, each dichotomy is assigned a score of 1 and 0, respectively. Third, the product is taken of the dichotomized variable and another variable suspected of interacting with the dichotomous variable (in this case one of the types of density). This product is a

dummy variable representing the interaction of the two independent variables, and can be entered into a regression equation applying ordinary least squares under the usual assumptions.

The following equations illustrate our approach.

Where X_1, X_2, X_3 are internal, external, and building densities, and Z_1, Z_2, Z_3, Z_4, Z_5 are the five life styles, equation (1) represents the ordinary least squares approach to regression, with the usual assumptions, including additivity:

$$(1) \quad Y = a + b_1X_1 + b_2X_2 \ldots + c_1Z_1 + c_2Z_2 \ldots + c_5Z_5 + e.$$

Equation (2) represents the ordinary least squares approach to regression, with the usual assumptions excepting the additivity assumption:

$$(2) \quad Y = a + b_1X_1 \ldots + c_1Z_1 \ldots + d_{11}X_1Z_1 + d_{12}X_1Z_2 \ldots + d_{35}X_3Z_5 + e,$$

where $d_{11}X_1Z_1 \ldots d_{35}X_3Z_5$ are the interaction terms for the three types of population density with the five life styles.

The logic of this approach to assessing the strength of interaction involves dichotomizing one of the interacting variables and assigning values of 1 and 0. By doing this and multiplying by one of the independent variables, one

eliminates the relationship between the independent and dependent variables for the high or low value of the interacting variable (depending on which was assigned the value of 0). The beta weight of the dummy variable on the dependent variable, then, can be interpreted as the degree to which the partial standardized slopes differ for both categories of the interacting variable (cf. Blalock, 1972: 500-502).

Table 11 depicts the slopes of strain on the different types of density and life styles. The beta weights for psychological strain on internal density and environmental strain on building density remain very close to the correlation coefficients for these relationships ($r = .116$ and $r = .166$, respectively). Life style, then, neither supresses nor inflates the relationships between these forms of population density and strain.

The addition of the 15 dummy variables to the regression equations for both dependent variables increased the total "explained" variance significantly. In the case of psychological strain the r^2 increased 63.4 percent (from $r^2 = .055$ to $r^2 = .90$), and in the case of environmental strain the increase was 69.7 percent (from $r^2 = .047$ to $r^2 = .081$).

All five life styles interact with at least one of the types of population density on psychological or environmental

TABLE 11

Beta Weights of Psychological and Environmental Strain on Population Densities and Life Styles

	Psychological Strain	Environmental Strain
Internal Density	.110*	-.036
External Density	-.022	-.045
Building Density	.023	.167*
Home/Social	.088	-.048
Home/Outdoors	-.033	-.061
Home/Hobbies	.149*	.053
Away/Informal	-.085	.139*
Away/Formal	-.120*	-.058
	$r^2 = .055$	$r^2 = .047$

*$p \leq .05$

strain. However, only two interaction terms are significant beyond the .05 level: (1) Building density - Home/Outside, on Environmental Strain, and (2) Internal density - Home/Hobbies, on Psychological Strain.

Psychological Strain

From Table 12 we can see that internal density predicts a significant amount of the variance in psychological strain only in situations where respondents report being relatively inactive. Internal density predicts the greatest amount of variance in psychological strain for respondents reporting inactivity in home-centred hobbies.

External density is a relatively poor predictor of psychological strain in all situations, as is building density. However, it is noteworthy that building density differs markedly as a predictor of psychological strain in both categories of the away/informal and away/formal life styles. That is, for those respondents reporting an away from home life style, formal or informal, building type is a positive predictor of psychological strain. For those scoring low on these life styles, building type is a negative predictor of psychological strain. The same pattern, though less pronounced, is evidenced in the high and low categories of the home/outside and home/hobbies life styles.

TABLE 12

Beta Weights for Psychological and Environmental Strain on Internal, External, and Building Densities for High and Low Values of Five Life Styles

	HOME/SOCIAL			HOME/OUTSIDE			HOME/HOBBIES			AWAY/INFORMAL			AWAY/FORMAL		
	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$
PSYCHOLOGICAL STRAIN															
Internal Density	.169*	.045	.124	.172*	.072	.100	.263*	-.043	.306*	.157*	.055	.102	.184*	.030	.154
External Density	-.023	-.019	-.004	-.077	.062	-.139	.017	-.079	.096	.039	-.098	.137	.000	-.039	.039
Building Density	.017	.027	-.010	-.036	.077	-.113	-.060	.083	-.143	-.070	.125	-.195	-.078	.117	-.195
ENVIRONMENTAL STRAIN															
Internal Density	.022	-.121	.143	.000	-.082	.082	.000	-.080	.080	.040	-.127	.167	.000	-.076	.076
External Density	-.047	-.037	.010	-.042	-.096	.054	-.020	-.072	.052	-.072	.000	-.072	-.111	.020	-.131
Building Density	.196*	.190*	.006	.133*	.273*	-.140	.131*	.259*	-.128	.151*	.225*	-.074	.166*	.215*	-.049
N	244	193		231	211		240	202		247	195		231	211	
$\bar{X}$	7.41			3.41			4.48			12.21			[illegible]		

*$p \leq .05$

The relationship of reported activity level to internal density and psychological strain is unexpected. In an earlier chapter we suggested that a low level of involvement in activities would "fit" better with high density than would a high level of involvement in activities. With respect to internal density and psychological strain, this is certainly not the situation.

Environmental Strain

With respect to environmental strain, the most obvious patterns in Table 12 are those involving internal and building densities. Internal density is not significantly related to environmental strain in either category for any of the life styles. In fact, for respondents reporting greater than average involvement in any of the life styles, all the betas for environmental strain on internal density are negative.

Building density is a significant positive predictor of environmental strain for both categories for all life styles. Building density is strongest as a predictor of environmental strain for individuals reporting a greater than average level of activity in home/outside and home/hobbies life styles. This lends some empirical support to the notion that handymen and high rises do not "fit".

In the case of psychological strain we noted that individuals reporting greater involvement in any of the life styles seemed relatively immune from the effects of internal density. This pattern is also found in the case of environmental strain. However, the reverse pattern, of building density being a stronger predictor of psychological strain for those reporting active life styles, is even more in evidence when we examine environmental strain. Building density is a stronger correlate of environmental strain for individuals who report active life styles.

Excepting the home/social life style, these data suggest that individuals may be caught in a "damned if you do, damned if you don't" situation. Active life styles may "fit" with internal density, but not with building density.

In order to examine this situation more closely, we combined all five life styles as one variable, dichotomized it at the mean, and regressed the dependent variables on the three types of population density for each category of activity. The results appear in Table 13.

The slopes in Table 13 are consistent with our earlier discussion of Table 12. Among respondents reporting a greater than average involvement in activity patterns generally, internal density is a negative predictor of both types of strain. For respondents who report a less than

TABLE 13

Beta Weights for Psychological and Environmental Strain on Internal, External, and Building Densities for High and Low Values of Activity

	PSYCHOLOGICAL STRAIN			ENVIRONMENTAL STRAIN		
	Activity			Activity		
	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$
Internal Density	.210*	-.024	.231*	.030	-.114	.140
External Density	.000	-.049	.049	-.032	-.054	-.022
Building Density	-.094	.171*	-.265*	.160*	.238*	.078
N	242	200		242	200	
$\bar{X}$	33.22			33.22		

*$p \leq .05$

average involvement in activity patterns, internal density is a direct predictor of psychological strain, and uncorrela with environmental strain. The results are less dramatic when we look at environmental strain. Here the biggest change involves internal density, where the beta weight is .030 for individuals reporting a lower than average involvem in activity patterns, and -.140 for their more active counterparts. Building density is a significant predictor of environmental strain for both categories of activity, though this type of density is a slightly better predictor for respondents claiming greater than average involvement in activity patterns.

For both measures of strain, especially, psychologic strain, the "damned if you do, damned if you don't" hypothesis receives a measure of empirical support. Individ who report an orientation toward general activity tend not to experience strain in high internal density settings. However, these individuals also tend to experience strain in high building density settings. On the other side, for individuals reporting an orientation toward inactivity, internal density is a stronger correlate of strain, and building density weakens as a predictor of strain.

Explanations

There are a number of plausible ways to explain our findings. First, one may be able to "lose himself" in activity patterns to the extent that he becomes unaware of relatively high levels of internal density, particularly when those around him are members of his own household. If one elects to "withdraw" into activities, he may be able to undertake these activities only with difficulty, due to physical and/or social constraints associated with high building density. This stress produces strain.

There are several problems associated with this explanation. First, referring back to Table 12, we can see that greater than average involvement in the home-social life style does not result in greater susceptibility to strain from building density. Therefore, it would have to be argued that the patterns of activity enbodied in this life style are less constrined by building density than are the other life styles. The home-social life style includes an orientation toward having "large parties", and the life styles that render individuals most susceptible to experiencing strain in high building density situations are away-centred activity patterns. In view of this, it is difficult to argue that the individuals who report greater than average involvement in the home-social life style are less constrained

by the density of their buildings than are individuals with away-centred life styles.

Direct empirical disconfirmation of this explanation is provided in Table 14. Here we see that the addition of four possible intervening variables (stimulus overload/household, stimulus overload/neighbours, inhibition/household, inhibition/neighbours) does not significantly affect the beta weights of any of the densities on either type of strain for either category of activity. If either type of stimulus overload or inhibition were intervening between density and strain, we would expect the introduction of these variables into the regression equation to reduce the beta weights between density and strain. Such is not the case. The differences in beta weights for strain on density across Tables 14 and 13 are negligible.

A second plausible explanation involves ordering the dependent variables in a causal sequence:

(1) Internal density causes psychological strain; but

(2) Building density causes environmental strain; and

(3) Environmental strain increases activities; and

(4) Activities reduce psychological strain.

Although the beta weights in Figure 4 are in the direction predicted by the four hypotheses, only the first two hypotheses receive empirical support, in the sense that the relevant beta weights are significant beyond the .05 level.

TABLE 14

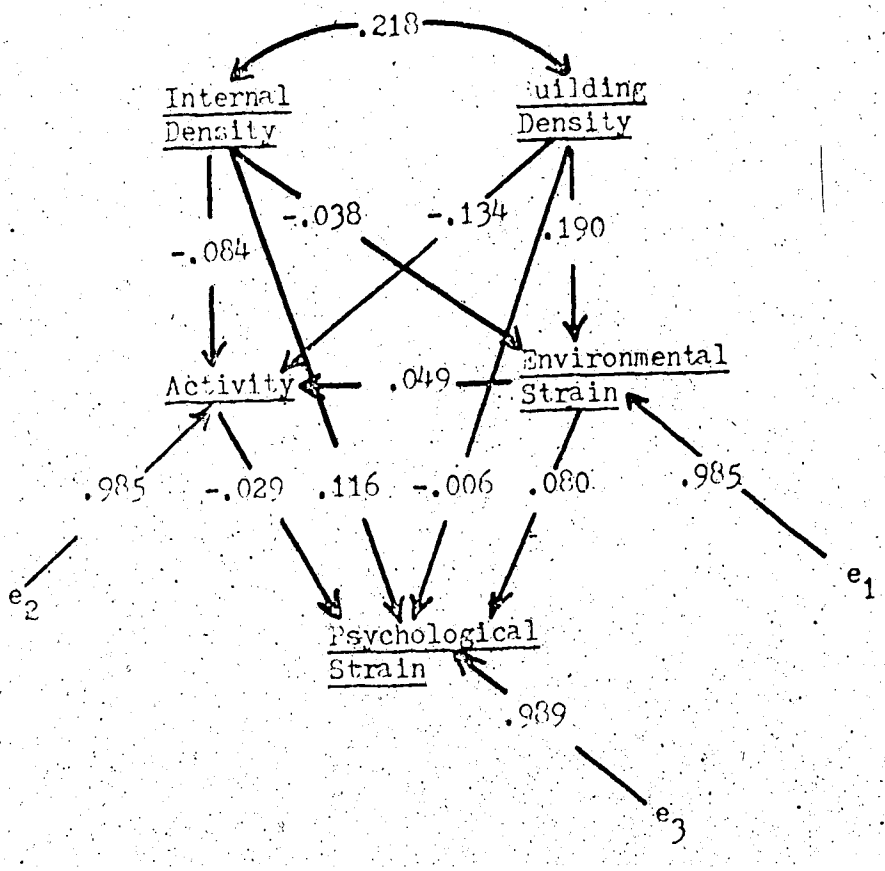
Beta Weights for Psychological and Environmental Strain on Stimulus Overload/Household, Stimulus Overload/Neighbours, Inhibition/Household, Inhibition/Neighbours, and Three Types of Population Density for High and Low Values of Activity

	PSYCHOLOGICAL STRAIN			ENVIRONMENTAL STRAIN		
	Activity			Activity		
	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$
Stimulus Overload						
Household	-.039	.038	-.077	.086	.067	.019
Neighbours	.078	.086	-.008	.028	.076	-.048
Inhibition						
Household	.192*	.172*	.020	-.029	.023	-.052
Neighbours	.071	.158*	-.087	.000	.043	-.043
Internal Density	.225*	.020	.205	.022	-.101	.123
External Density	-.041	-.078	.037	-.028	-.053	.025
Building Density	-.109	.174*	-.283	.158*	.243*	-.085
N	242	200		242	200	
$\bar{X}$	33.22			33.22		

*p $\leq$ .05

FIGURE 4

A PATH MODEL FOR INTERNAL DENSITY AND BUILDING DENSITY AS EXOGENOUS VARIABLES, ACTIVITY LEVEL AND ENVIRONMENTAL STRAIN AS INTERVENING VARIABLES, AND PSYCHOLOGICAL STRAIN AS A DEPENDENT VARIABLE



This, of course, does not confirm hypotheses (1) and (2), since they are statements of cause. Rather, we have failed to reject these hypotheses. (At the same time, the low magnitudes of the betas suggest that, given the idiosyncracies of our measures and sample, if the two types of density are causes of the two types of strain, the causal impact is not great.)

Hypotheses (3) and (4) are rejected, since the probability that the associations involved are due to chance is too great. Further, even if these betas were significant beyond the .05 level, as they would be in a much larger sample, the sizes of the beta weights involved imply irrelevance.

Other explanations of our findings can be proposed, but we have [redacted] assessing their adequacy. For example, reversing se[redacted]ows us to postulate that neurotics (psychologica[redacted]) in high internal density settings become inactive[redacted]ereas neurotics in high building density settings become [redacted]tive. However, since we can suggest no logical reason [redacted] this should be the case, a search for intervening var[redacted]bles would at this time be haphazard.

Conclusions

A number of conclusions can be drawn from the preceding analyses. First, both internal and building densities interact in opposition, with reported life style as predictors of psychological strain.

Second, internal density interacts to a limited degree with reported life style as a predictor of environmental strain.

Third, building density interacts to a limited degree with reported involvement in the home/hobbies and home/outside life styles as a predictor of environmental strain.

Fourth, building density is a significant predictor of environmental strain across all values of all reported life styles.

Fifth, individuals reporting greater than average involvement in the home/social life style experience less psychological and environmental strain than do individuals reporting greater than average involvement in any of the other life styles.

Sixth, though external density is not a significant correlate of either type of strain, there is a weak but significant relationship between external density and reported involvement in the home/outside life style on psychological strain.

Interaction of Perceptual Reactance on Strain

The next stage in the analysis is the examination of the relationships of perceptual reactance to the three types of density and psychological and environmental strain. Table 15 shows the zero-order correlations between the three types of density, psychological strain, environmental strain and perceptual reactance (p/r).

Score on the p/r scale is a significant, though weak predictor of psychological and environmental strain. A weak correlation also exists between score on the p/r scale and external density.

In testing for interaction between score on the p/r scale and density on strain we used the same dummy variable approach described in the preceding section. Respondents were categorized as augmenters if their score on the p/r scale was less than the mean. Individuals scoring higher than the mean were categorized as reducers.

The addition of the dummy variables representing the interaction terms between perceptual reactance and the three types of population density has a significant effect on the "explained" variation for the equation pertaining to psychological strain, but not environmental strain. In the case of psychological strain, the r^2 for the equation without the interaction terms is .04044. The addition of

TABLE 15

Zero-Order Correlations Between Three Types of Population Density, Psychological and Environmental Strain, and Perceptual Reactance

	Perceptual Reactance
Internal Density	-.053
External Density	.095*
Building Density	.032
Psychological Strain	-.170*
Environmental Strain	-.105*

*$p \leq .05$

the dummy variables into the equation increases the r^2 to .05790, an increase of 43.18 percent. With environmental strain, the interaction terms increase the r^2 only 10.06 percent (from r^2 = .04323 to r^2 = .04758). None of the interaction terms add significantly to the predictive power of the equation for environmental strain, while the interaction term for internal density and perceptual reactance is significant beyond the .05 level in the equation for psychological strain.

To examine more closely the interaction of perceptual reactance with internal density on psychological strain we once again dichotomized the sample on the basis of score on the p/r scale and regressed psychological strain on the three types of population density. The results appear in Table 16.

From Table 16 we can see that internal density is a significant predictor of psychological strain for those reporting less than the average score on the perceptual reactance scale. For individuals reporting a score of higher than the mean (reducers), none of the types of population density is a significant predictor of psychological strain.

In view of our initial discussion of perceptual reactance, we would expect to find stimulus overload/household to intervene between internal density and psychological

TABLE 16

Beta Weights for Psychological Strain on Internal, External, and Building Densities for High and Low Values of Perceptual Reactance (Reducers and Augmenters, Respectively)

	PERCEPTUAL REACTANCE		
	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$
	Augmenters	Reducers	Difference
Internal Density	.209*	-.046	.255*
External Density	-.053	.046	-.099
Building Density	.000	.048	-.048
N	247	195	
$\bar{X}$	10.005		

*$p \leq .05$

strain for augmenters, while any strain experienced by reducers is likely to be the result of perceived inhibitions. Again, however, our "intervening" variables appear not to intervene between density and strain for either category of respondent.

The beta weights in Table 17 indicate that neither stimulus overload nor inhibition act as intervening variables between any of the population densities and psychological strain for either augmenters or reducers. The beta weight for psychological strain on internal density for augmenters is approximately .200, with or without the "intervening" variables in the equation.

Conclusions

Though it is clear that stimulus overload and inhibition do not, as we predicted, intervene between density and strain, it is noteworthy that there are significant differences in the predicted directions for neighbour-related stimulus overload and inhibition for both categories of perceptual reactance. That is, augmenters differ significantly from reducers in that for the former stimulus overload/neighbours is a positive predictor of psychological strain whereas for the latter, this measure of stimulus overload is a very weak negative correlate of strain. Further, for

TABLE 17

Beta Weights for Psychological Strain on Two Types of Stimulus Overload, Two Types of Inhibition, and Three Types of Population Density for Augmenters and Reducers

	PERCEPTUAL REACTANCE		
	Augmenters	Reducers	Difference
Stimulus Overload			
Household	-.051	.026	-.077
Neighbours	.124	-.034	.157
Inhibition			
Household	.148*	.187*	.039
Neighbours	.046	.252*	-.206*
Internal Density	.222*	.000	.222*
External Density	-.030	-.065	-.035
Building Density	.000	.013	-.013
N	247	195	
$\bar{X}$	10.005		

*$p \leq .05$

reducers, inhibition/neighbours is a moderate positive predictor of psychological strain, but for augmenters inhibition/neighbours is a very weak correlate of strain.

As we pointed out earlier, the measure we used to indicate perceptual reactance is far from satisfactory. However, the results of the preceding analysis are encouragin in that this measure does enhance our ability to predict psychological strain from population density; and the relationships of stimulus overload and inhibition with our measure of perceptual reactance and strain are in the predicted directions. Further research on the relationship of perceptual reactance to density and crowding might well prove fruitful, especially if more precise measures are employed.

Interaction of Perceived Similarity on Strain

The third condition to be examined that may affect the relationship between population density and strain is perceived similarity.

Table 18 contains the zero-order correlations between the three types of density, psychological and environmental strain, and perceived similarity. As the table shows, the only significant correlation is between perceived similarity and environmental strain. This indicates a slight tendency

TABLE 18

Zero-Order Correlations Between Three Types of Population Density, Psychological and Environmental Strain, and Perceived Similarity

	Perceived Similarity
Internal Density	.047
External Density	.020
Building Density	.064
Psychological Strain	.043
Environmental Strain	.144*

*$p \leq .05$

on the part of those reporting feelings of dissimilarity from their neighbours to report higher levels of environmental strain.

We again employed the dummy variable approach in a search for interaction between perceived similarity and population density on strain.

No significant interaction was found between these variables on environmental strain. The addition of the interaction terms into the regression equation increased the r^2 from .04910 to .05493, an increase of only 11.87 percent (.00583).

The absence of interaction in the case of environmenta strain is in direct contrast with the situation found with psychological strain. Here, the introduction of the interaction terms increased the "explained" variation in the dependent variable 147.71 percent. For the equation without the interaction terms r^2 = .01509; with the dummy variables in the equation, r^2 = .03738.

From Table 19 we can see that perceived similarity interacts with all three types of population density on psychological strain. For individuals reporting that they are similar to their neighbours, internal density is a positive predictor of psychological strain, and building density is a negative predictor of this dependent variable. For those reporting a perception of dissimilarity from their

TABLE 19

Beta Weights for Psychological Strain on Internal, External, and Building Densities for Perceived Similarity and Dissimilarity

	Perceived Similarity	Perceived Dissimilarity	Difference
Internal Density	.229*	-.030	.259*
External Density	.071	-.122	.193
Building Density	-.093	.136	-.229*
N	253	187	

*$p \leq .05$

neighbours, the direction of the relationships between these variables is reversed. Here, building density is a direct predictor of strain, while internal density is a very weak negative predictor of psychological strain.

External density also interacts with perceived similarity on psychological strain. This type of population density is a positive predictor of psychological strain among individuals reporting a perception of similarity to their neighbours, and a negative predictor of strain for individuals reporting a feeling of dissimilarity.

Explanations

Again, because of the nature of this research, several plausible explanations can be developed to "account" for our findings.

First, the original speculation that people will feel less crowded among others who are similar to them may indeed be accurate. This explanation fits with the evidence regarding building density, reported perception of similarity, and psychological strain. Further, it can be postulated that when one perceives his neighbours to be different from himself, their proximity is bothersome to the point that internal density ceases to operate as an aversive stimulus. In fact, internal density, insofar as household *size* is a

component of it, could conceivably become an asset--friends in an alien environment. Among individuals reporting a perception of similarity, the proximity of neighbours is an asset, while the negative effect of internal density operates unfettered.

A second, equally plausible explanation can be developed if one organizes the variables into a different causal sequence. Individuals who tend to experience strain in high building density settings are more likely to report that they are dissimilar from their neighbours either because they are more aware of their neighbours and their actual differences, or because their tendency toward psychological strain distorts their perception and/or reporting of similarity-dissimilarity.

Though both of these explanations are plausible, neither accounts for the direction of the interaction between external density and perceived similarity. Inexplicably, external density is a positive predictor of psychological strain for individuals reporting a perception of similarity to their neighbours, and a negative predictor of this dependent variable for people reporting feelings of dissimilarit In this way, the slopes of psychological strain on external density more resemble those of psychological strain on internal density than on building density.

In an effort to discover more about the nature of the relationships found in the preceding analysis, we examined

the characteristics that respondents believed distinguished themselves from t[illegible]ighbours.

Responden[illegible]ing perceptions of dissimilarity from their neighb[illegible]d life style with a greater frequency--[illegible] pe[illegible](48)--than any other single distinguishing cha[illegible]eri[illegible]c. Therefore, in view of the relative importance of [illegible]fe[illegible]yle as a distinguishing characteristic, we first compa[illegible]e "effects" of perceived similarity with those of life s[illegible] on the relationships between population densities and ps[illegible]ological strain, by visually comparing Tables 13 and 19. [illegible]ere one can see that the interaction patterns of activi[illegible] level, population densities, and psychological strain are generally coincident with the interaction patterns of perceived similarity and density with psychological s[illegible]in.

In spite of[illegible]ese promising leads, further analysis demonstrated that life style, insofar as it is represented by activity level, does not covary with reported perception of similarity to one's neighbours to "affect" the relationship between population density and psychological strain. First, the zero-order correlation between perceived similarity and activity level is very low, $r = -.006$. Second, when psychological strain was regressed on the dummy variables representing the interaction terms for perceived similarity and activity level with the three types of density, the

original beta weights for the two sets of dummy variables changed very little. If activity level and perceived similarity were covarying in interaction with density on psychological strain, the beta weights for one of the sets of dummy variables would be lowered by introducing the other set into the equation.

Conclusions

Again, our conclusions are confined to noting that the power of population densities in predicting strain is influenced significantly by extraneous conditions. Earlier we found that various measures of life style interact with densities as predictors of both psychological and environmental strain, and that our measure of perceptual reactance interacts with internal density to affect psychological strain. To these findings we can add that reported perception of similarity-dissimilarity from respondents' neighbours interacts with all three types of population density to influence psychological strain.

TABLE 20

Zero-Order Correlations Between Building Density, Shared Walls, Shared Floor, Shared Ceiling, and Height

	Building Density	Shared Walls	Shared Floor	Shared Ceiling	Height
Building Density	X				
Shared Walls	.424	X			
Shared Floor	.631	.410	X		
Shared Ceiling	.680	.460	.512	X	
Height	.803	.327	.627	.527	X

All of these correlations are significant beyond the .05 level.

CHAPTER VII

DESIGN AS A PREDICTOR OF STRAIN

Building Density and Design Factors

In Chapter IV we examined some of the stru[illegible]al features that are logical correlates of building density and that may intervene between building density and strai The most immediate elements of high density design seem t be the vertical and horizontal stacking of dwelling units Vertical stacking produces a higher proportion of dwellin units sharing floors and ceilings, as well as increasing distance of dwelling units from the ground. Horizontal stacking increases the proportion of dwelling units shari walls.

Table 20 shows the zero-order correlations betwee building density and these structural features.

The expectation that building density is characte by these structural features is supported by the data. In

fact the correlations are so strong relative to the associations between building density and the two types of strain that attempts to separate the "effects" of these independent variables on the psychological and environmental strain were hampered by high standard errors. However, unlike the earlier instances where some dummy variables were extremely strong correlates (e.g., r = .945) of another dependent variable, the strongest correlation here is r = .803, between building density and height. This, combined with the moderately large sample size of 442, should not result in widely fluctuating slope estimates, though beta weights of a moderate size may not be significant at the .05 level.

Table 21 contains the beta weights for psychological and environmental strain on the three types of population density and the four structural features of high density designs. Three points are noteworthy. First, with respect to psychological strain, the beta weights and correlation coefficients differ very little, indicating that there is scant covariance between any of the independent variables and the dependent variable. With the exception of internal density, then, one can conclude that the other two types of population density and the structural factors are inconsequential predictors of psychological strain.

Second, regarding environmental strain, the correlation coefficient between building density and the dependent variable

TABLE 21

Zero-Order Correlations and Beta Weights, Psychological and Environmental Strain on Three Types of Population Density, and Four Structural Factors

	Psychological Strain		Environmental Strain	
	r	b	r	b
Internal Density	.116*	.120*	.000	-.042
External Density	.002	.007	-.033	-.111
Building Density	.031	.042	.166*	.077
Shared Walls	-.056	-.087	.123*	.062
Shared Floor	-.030	-.088	.130*	.064
Shared Ceiling	.037	.063	.138*	.084
Height	.016	.012	.136*	.024

*$p \leq .05$

is reduced to insignificance by the inclusion of the structural factors in the regression equation. Referring back to Table 7, one can see that the beta weight for environmental strain on building density, controlling for internal and external density, was b = .190. Controlling for the four design factors reduced this to b = .077 (Table 21). Building density and the four design factors are all weak, but significant zero-order correlates of environmental strain. However, the beta weights indicate that each of these independent variables is insignificant as an independent predictor of environmental strain.

Third, with respect to Fanning's (1967) research on the relationship of height and strain, our data seem divergent. The zero-order correlation between height and strain is near zero (r = .016), with the regression coefficient even smaller (b = .012). However, Fanning's investigation was conducted on married women, and our sample includes men and women in various marital statuses. Consequently, we selected all of our respondents who were female and who reported that they were married in an effort to replicate Fanning's findings with a comparable sample.

Height, Motherhood, and Strain

Surprisingly, of the 261 women in our sample, only 31 reported being married. Though the overrepresentation of single mothers in public housing projects has been noted before (see for example, Audet, 1970) finding less than 10 percent of our total sample to be married women is not only alarming, but hampers further analysis. The small sample of married women and the multicollinearity between the independent variables will undoubtedly combine to inflate the standard errors of the estimates of beta weights.

In an effort to hold these undesirable effects to a minimum, we dropped building density from the equation, since this independent variable is most highly correlated with the other independent variables (especially height). The results appear in Table 22.

As Table 22 indicates, the distance of a married woman's dwelling unit from the ground is the only significant correlate of psychological strain. Further, the standardized partial slope for psychological strain on height is significant beyond the .02 level, even after controlling for five other variables which are highly correlated with height.

The fact that the beta weight for psychological strain on height exceeds unity, indicates the degree to which the multicollinearity of the independent variables for this

TABLE 22

Zero-Order Correlations and Beta Weights for Psychological Strain on Three Types of Population Density and Four Structural Factors, for Married Women

	Psychological Strain	
	r	b
Height	.403*	1.169*
Shared Floors	.209	-.967
External Density	.053	.258
Internal Density	-.041	-.127
Shared Walls	.179	-.252
Shared Ceilings	.207	.207
Building Density	.279	**

*$p \leq .05$

**This variable was not included in the regression equation because of its high intercorrelation with the other independent variables.

small sub-sample affects slope estimates. Clearly, these standardized partial slopes cannot be given a confident P R E interpretation. Nevertheless, these beta weights can be interpreted as an ordinal measure of the independent strengths of the predictor variables. Therefore, using a comparable (though indeed very small) sample, we cannot dispute Fanning's discovery that the height of a married woman's dwelling unit causes psychological strain. However, it would be prudent again to caution that the design of this study neither eliminates the possibility of selection factors operating (not only may married women find high living disturbing, but disturbed married women may have a preference for high living) nor the possibility of a spurious interpretation.

Since one of the contractual requirements with C.M.H.C. involved including only individuals with children in the sample, we cannot assess the degree to which the correlation between height and psychological strain in married women is conditional on motherhood. However, we can attempt to discover the degree to which this correlation is an attribute of marital status, sex, or the interaction of the two.

Table 23 contains the same variables and regression equations as Table 22, but rather than using married women as the sub-sample for the analysis, we used (1) men who

TABLE 23

Zero-Order Correlations and Beta Weights for Psychological Strain on Two Types of Population Density and Four Structural Factors, for Unmarried Mothers and Married Fathers

	Unmarried Mothers		Married Fathers	
	r	b	r	b
Internal Density	.054	.061	.047	.044
External Density	-.029	.012	.002	-.057
Shared Walls	-.121	-.111	-.022	-.077
Shared Floor	-.118	-.184*	.051	.214
Shared Ceiling	-.018	.050	.067	.172
Height	-.003	.114	-.086	-.261*
N	229		169	

*$p \leq .05$

reported being married, and (2) mothers who reported that they were not married.[1]

The data suggest that if married mothers tend to experience psychological strain when they inhabit upper stories, it is more likely because they are mothers than because they are married. For married fathers, height is a significant negative predictor of psychological strain. If this indicates a causal relationship, then, height tends to prevent married fathers from experiencing psychological strain. On the other side, for unmarried mothers, height is a positive predictor of psychological strain. However, the low magnitude of the beta weight, and the fact that it is insignificant at the .05 level, suggest that being a mother and being married may interact on the relationship between height and psychological strain. (For married mothers the beta weight for strain on height is significant beyond the .02 level.)

The negative slope for psychological strain on height in the sub-sample of married fathers is also of special interest since Wallace (1952) has noted that the roles of fathers in upper-level dwelling units have been

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[1] Our sample contained five women who reported common-law marriages. These were not included in the sub-sample of unmarried mothers, nor were they included in the sub-sample of married mothers, in the interest of comparability with Fanning's sample.

reduced to that of "star border" (Michelson, 1970:81). If this is indeed the case, the fathers in our sample tend not to find this role distressing.

Design Factors, Activity, and Strain

The final phase of our data analysis entails an attempt to see if the four structural factors interact with either reported involvement in activities or perceived similarity to affect psychological and environmental strain.[2]

A comparison of Tables 13 and 24 shows that the addition of the four structural factors to the regression equation for psychological strain has almost no effect on the interaction of activity level with any of the population densities. Further, none of the beta weights for psychological strain on any of the design factors is significant at the .05 level.

The persistent interaction between reported involvement in our life styles and building density suggests that it may be the size of the structures in which the residences of

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[2] Since perceptual reactance did not interact with building density on either type of strain we will assume that perceptual reactance also fails to interact with any of the four structural factors on strain. Similarly, since the interaction term for building density and perceived similarity on environmental strain was not significant at the .05 level, we will exclude environmental strain from the analysis in Table 24.

TABLE 24

Beta Weights for Psychological and Environmental Strain on Three Types of Population Density and Four Structural Factors for High and Low Values of Activity

	PSYCHOLOGICAL STRAIN			ENVIRONMENTAL STRAIN		
	Activity			Activity		
	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$	$<\bar{X}$	$>\bar{X}$	$<\bar{X}->\bar{X}$
Internal Density	.216*	-.012	.228	.025	-.096	.121
External Density	.039	-.025	.064	-.065	-.171	-.106
Building Density	-.042	.229	-.271	.175	-.049	.224
Shared Walls	-.133	-.044	-.089	.045	.090	-.035
Shared Floor	-.079	-.088	.009	.124	-.042	.166
Shared Ceiling	.012	.073	-.061	.000	.185	-.185
Height	.040	-.054	.094	-.122	.253*	-.375

*$p \leq .05$

active individuals are located that may be causing psychologica strain (if indeed the relationship is causal). In any case, the design factors contribute very little to psychological strain among people reporting active life styles.

Structural factors are much more important in the case of environmental strain. A comparison of Tables 13 and 24 shows that the relationship between building density and the dependent variable for people reporting involvement in activity patterns is due almost entirely to height and shared ceiling. For "inactives", building density continues to be a positive predictor of environmental strain, as is shared floor.

The interaction of height with reported activity on environmental strain suggests that people with active life styles may dislike the diminished access to the outside afforded by high rise living. On the other hand, the negative slope for environmental strain on height for those reporting low levels of activity may indicate that diminished access from the outside is regarded as an asset by these types of people.

Finally, the slopes of environmental strain on shared floor and shared ceiling for both categories of reported involvement in activity depict noteworthy divergences. People reporting low involvement may be disturbed in units with a shared floor (downstairs neighbours). These respondents

are not disturbed by sharing their ceiling (having upstairs neighbours). On the other side, we find a complete reversal for people reporting high involvement in activity patterns. For this category, shared floors are not disturbing, while the beta weight for environmental strain on shared ceiling is b = .185, suggesting that having upstairs neighbours may disturb active people. These slopes may indicate that active people are more likely than inactive people to be disturbed by noises from other tenants. Further, inactive people may be not only more tolerant of the sounds of others, but "inactives" may inhibit their own behaviours to a greater extent than do "actives" when there is the possibility of disturbing others. In other words, there may be a "consideration for others" continuum along which people can be placed that would account for the correlations found between shared floors and ceilings, reported activity levels, and environmental strain. This, of course, is speculation and should be the subject of further empirical investigations.

Design Factors, Perceived Similarity, and Strain

In comparing Table 25 with Table 19 in the preceding chapter, one can see that the interaction of perceived similarity with internal and external densities on psychological strain intensifies when we control for the four structural

TABLE 25

Beta Weights for Psychological Strain on Three Types of Population Density and Four Structural Factors for Perceived Similarity and Dissimilarity

	Perceived Similarity	Perceived Dissimilarity	Difference
Internal Density	.253*	-.041	.291*
External Density	.167	-.124	.291
Building Density	.000	.126	-.126
Shared Walls	-.071	-.115	-.044
Shared Floor	-.203*	-.018	-.185
Shared Ceiling	.019	.109	-.090
Height	.000	.000	.000

*$p \leq .05$

factors. The interaction of perceived similarity with building density on strain, however, is reduced. This reduction is due almost entirely to the fact that for some reason respondents perceiving themselves as similar to their neighbours tend to experience less psychological strain when they have neighbours beneath them. The negativ beta weight for psychological strain on building density fo respondents perceiving similarity (b = -.093) in Table 19, then, is a result of the correlation between building density and shared floors (r = .631).

For respondents reporting a perception of dissimila between themselves and their neighbours, building type and shared ceiling are positive predictors of psychological str

Conclusions

Building density is a strong correlate of four structural design factors. These factors, in some cases, seem to be the elements of building density which may cause dissatisfaction among residents.

Horizontal stacking, insofar as it is represented by the number of walls shared by a dwelling unit, creates little psychological or environmental strain among our respondents. The strongest positive beta weight involving shared walls is b = .09, for respondents reporting greate

than average involvement in activity patterns, and environmental strain. In fact in many instances, shared walls is a negative predictor of both types of strain.

Vertical stacking may create problems for some types of people and not others. The storey on which one's dwelling unit is located, for example, is a strong positive predictor of psychological strain among married mothers and individuals reporting a greater than average involvement in activity patterns. On the other side, for married fathers and respondents reporting lower than average activity, height is a negative predictor of psychological and environmental strain, respectively.

Like height, shared floor and shared ceiling varied across different types of respondents as predictors of psychological and environmental strain. Mothers, for example, do not suffer when they share floors, and may in fact benefit from it. Conversely, fathers who share either floors or ceilings with neighbours tend to experience psychological strain.

CHAPTER VIII

SOME IMPLICATIONS

Some Implications for Social Science

A number of important implications can be developed from the conclusions of the preceding chapters.

First, "population density" is a multi-dimensional concept. At least three types of population density can be distinguished: internal density (number of people per room) external density (number of people per acre), and building density (number of people or dwelling units per building).

Second, the three types of population density vary in power as predictors of human behaviours and conditions, depending on the variable being predicted. For example, in this study we found that under unspecified conditions, internal density is a consistently better predictor of scores

on the Indik et al. measure of psychological strain than is external or building density. However, building density is a better predictor of scores on the environmental strain scale than are the other two types of density.[1]

Third, the predictive power of the different types of population density on the two types of strain varies with the values of other variables. For example, internal density is a significant positive predictor of psychological strain for people who report a lower than average involvement in the activity patterns described in the life style scale. However, for those reporting a greater than average involvement in these activities, internal density is a weak negative predictor. From this one can conclude that in some instances, a given range of population density does not cause psychological strain (insofar as our measure is valid), while in other instances population density may indeed cause psychological strain.

Although the design of this study does not allow a more definite statement concerning causation, this demonstration of variability in the predictive power of population density has important implications for the evaluation of

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[1] A recent study by Michelson and Garland (1974) found "site density" ("the number of families living on the same block face within 600 feet of the respondent") to be a significant predictor of "threatened marital break up." Hence, we should not dismiss external density as having no effect whatsoever on the human condition.

sociological research, the development of theory, and social engineering.

With respect to research done on the correlates of population density, it is clear that divergent findings in past research conducted on different populations may have resulted in different conclusions not only because of differences in the nature of the independent and dependent variables across studies on density, but also because differences in the values of variables associated with specific populations may produce divergence in the findings of sociological research.

With respect to sociological theory, the interaction of population density (and design factors) with social and psychological variables is further support for the view that theorists should neither ignore the physical environment as a possible determinant of behaviours, nor embrace an environmental determinist perspective to the neglect of important social variables. The relationship between physical and social variables is complex since people both affect their environments and are affected by their environments, and the relationships between social, psychological, and physical variables is not necessarily additive.

Some Policy Implications

The implications for social engineering and policy formulation follow from the preceding paragraph. However, it should first be emphasized that our ability to generalize the findings of this study is limited. The population for the study is far from typical and the ranges of population density are population-specific. A different population or the same population experiencing higher levels of density could have produced different results. For example, the scope of this study prevents us from drawing broad conclusions that would be of interest to government policy makers concerning public housing. Because our sample consists of only public housing residents we cannot assess whether the levels of strain among our respondents are high or low. The mean value for the sample on psychological strain is 24.96 and, for environmental strain the mean score is 9.63. These are not high scores if one considers that the maximum possible scores for psychological strain and environmental strain are 80.0 and 15.0 respectively. However, whether residents of housing projects with different funding sources and payment systems enjoy significantly lower levels of strain is unknown.

The extent to which we can provide useful information to policy makers is also limited by the variables upon which

this research focused. Our primary concern was population densities and social and psychological variables interacting as stress or strain. This is a relatively specific focus, especially when one considers all the variables that can affect satisfaction with the housing environment. (For a well-organized list of the important variables affecting "habitability" see Onibokun, 1971.) However, with respect to building design this thesis provides the following information pertinent to social policy.

The data suggest that the respondents have a general preference for low density housing. This is not surprising since many studies have noted that North American populations tend generally to value the single, detached design. However, what may surprise one is the relatively minor "effect" building density and the related structural characteristics have on environmental strain. Though the relationships are attenuated by measurement error, even if the correlations were doubled, building density and the design factors would "account" for less than 10 percent of the variance in environmental strain, a variable composed of statements regarding general housing satisfaction and plans and feelings concerning moving. Clearly, building density and the related design characteristics we examined are not, in and of themselves, great in their impact on housing satisfaction for our respondents as a whole. Rather, some

types of people and activity patterns may "fit" with high building densities while others do not. For example, the data indicate that married mothers experience psychological strain in association with height, yet people who report a perception of themselves as being similar to their neighbours are less likely to experience psychological strain in association with high building density or the related design characteristics. Even if the measurement of perceived similarity is invalid, or if the relationships between perceived similarity, building density, design factors, and psychological strain are the results of unknown factors, perceived similarity is a variable that allows us to predict that some people do not experience psychological strain in association with high building density. Hence, to reject high density designs out of hand, because some people who reside in them experience discomfort, seems analagous to "throwing the baby out with the bath water".

With respect to the design elements associated with high building density, horizontal stacking seems to be of minor importance as a cause of either psychological or environmental strain. Uniformly low correlations were found between shared walls and the dependent variables. On the other side, vertical stacking may be a more important causal agent. Height, shared floor, and shared ceiling were found to be positive correlates of one or other of the

dependent variables given different values of interacting variables.

The data indicate that placement of tenants with different life styles relative to each other could be of some importance. For example, respondents reporting greater than average involvement in activity patterns tend to experience environmental strain in conjunction with shared ceilings, but not with shared floors. Less active respondents tend to experience environmental strain in conjunction with shared floors, but not shared ceilings. It is possible that environmental strain could be reduced for both types of people if they located themselves in dwelling units on the top and bottom floors, respectively. In this way, those bothered by shared ceilings and those disturbed by shared floors should have higher levels of environmental satisfaction, if the correlations discussed above are causal. However, since we have no way of ascertaining whether this is the case, such action would be experimental, and not necessarily remedial.

Perhaps the most important contribution of this study is the provision of additional empirical support for the view that some people seem to "fit" particular housing environments better than do others. In view of this, policy makers would be well-advised to encourage the construction of a variety of housing designs for public housing projects,

and allow people to live in the units in which they experience the least discomfort.

Some Suggestions for Future Research

One of the major disappointments of this study is the fact that we were unable to gain any insight into what it is about population density in interaction with other variables that may produce strain. Either our attempts to measure stimulus bombardment and inhibition were unsuccessful,[2] or these variables simply do not intervene between density and either psychological or environmental strain. Though either or both of these interpretations may be accurate, a third is also possible. That is, the correlations we discovered between density and strain are not causal. If, for example, the real causal chain involving height, motherhood, and strain is that miserable mothers have an orientation toward high living, we should not logically expect stimulus bombardment or inhibition to intervene between height and psychological strain.

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[2] As we pointed out in Chapter V, our measures of stimulus overload and inhibition were not entirely staisfactory. A multi-trait, multi-method approach, especially if it encorporated nonreactive measures, would be valuable for further research involving these variables.

The preceding illustrates one of the major shortcomings of this research. The ex post facto design does not allow us to distinguish causal from non-causal relationships. The first suggestion for future research, then, is that an experimental or quasi-experimental design be employed.

In a laboratory setting, some of the relationships involving internal density, interacting variables, and strain that were uncovered by our research in the field could be retested, using an experimental design and independent measures. In fact, the laboratory setting could also be used to develop more precise measures for field research. (For example, a reliable scale for the measurement of perceptual reactance might be developed in conjunction with Petrie's technique of measuring this variable.)

Field research could also be based on the experimental method, if there was some way of controlling for self-selection in settings containing an adequate amount of "natural" variation in the independent variables. Possibilities for doing such research may exist in military settings, as Fanning's study of the wives of servicemen illustrates, or in student residences or government supported housing projects. Like the population for the present study, these populations would contain atypical categories of people. However, if researchers could find the same causal relationships operating within disparate, though atypical populations, we

would at least be started toward a body of general knowledge concerning the relationship of physical and social variables as causes of behaviours. As it is, the ex post facto design allows social scientists to disconfirm statements about cause, to explore, and to predict, and although these skills are limited, they are not without value.

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APPENDIX A

LETTER TO RESPONDENTS: HOUSING AUTHORITY

NOTE: A SIMILAR FLYER WAS DISTRIBUTED TO PUBLIC HOUSING TENANTS IN EDMONTON.

THE CALGARY HOUSING AUTHORITY

625 - 4th Avenue South West
Calgary, Alberta, T2P 0K2
Telephone 269-3141

6th May, 1974

NOTICE TO TENANTS REGARDING ALBERTA HOUSING STUDY:

This note is to inform tenants that an independent Alberta Housing Study has selected some tenants for a research project which will take place in May. The Study will look at how social study programmes should be improved now and in the future for families with children living on restricted budgets. Also, of necessity, are the special needs of single parent families.

We are sending this note to all tenants because we do not know which tenants will be selected for interviews.

There have been many Studies carried out in the past, however, we do feel strongly that this one is all encompassing and it does have the Housing Authority's backing. It should help you improve your housing situation, now and in the future, and it will help us understand some of the relevant problems.

If you are to be one of the tenants interviewed in the Alberta Housing Study, you will get a personal letter from Dr. Earl Snider, Study Director, Department of Sociology, University of Alberta.

If you have any questions, please contact Dr. Snider's Calgary office at 244-9608.

All of your answers will be kept in strict confidence by the University Research Committee.

If the Study is to be a good one, your co-operation is necessary and would be greatly appreciated.

F.W. Betts,
Administrator.

APPENDIX B

LETTER TO RESPONDENTS: ALBERTA HOUSING STUDY

DEPARTMENT OF SOCIOLOGY
TELEPHONE (403) 432-5234

THE UNIVERSITY OF ALBERTA
EDMONTON, CANADA
T6G 2E1

Dear :

For some time now, the federal government has been interested in finding out exactly how well some of their housing programs are doing, especially for families with restricted incomes now. The Alberta Housing Study is a special study designed to get to the facts on how your housing is working for you and in what ways the design could be better.

You have been selected at random from a large list of tenants to help us find out what your housing needs might be like in the future and what problems you think need attention now. This is not "just another study" but is designed to make things happen on projects now, for other projects in the future, and fc new special programs such as helping people find their own houses.

Careful attention will be paid to the needs of children in this study as well as the design of units, how projects should be managed, the special needs of one-parent families, and other important things. This is all important information and it will take about an hour, in your own home, to do the intervi

All the information we collect in the interview is strictly confidential. Your name and address will never be used. All the things you tell us will be combined with what others tell us too. Some of them may also be from your proj

We know that you may have been asked questions before. This study is different because it is set up to act, as early as this Fall. You will be kept informed as things happen. Please help. You will be called in the next few weeks for an interview time that is convenient for you. Your interviewer will carry a letter of introduction.

I am writing you this personal letter so you will know that our interests are genuine. We are interested in your answers no matter how long you have liv there or even if you are planning a move soon. If you have any questions pleas call Susan at our Calgary office at 244-9608.

Sincerely,

Earle Snider, Ph.D.
Director, Alberta Housing Study

APPENDIX C

INTERVIEW SCHEDULE

Interview Number 1

ALBERTA HOUSING STUDY

Interview Date _____

Interview Length _____

Interviewer _____

NOTE: THIS FORM IS A REDUCTION OF THE ORIGINAL 8½X14

CONFIDENTIAL

1. Respondent is: ___head ___spouse

2. Sex of head ___male ___female

3. Are you married? ___single (SKIP TO Q. 6)
___married
___separated
___widow(er)
___divorced
___common law

4. IF MAR, SEP, WID, DIV, OR COM. LAW: For how long please? _____years

5. IF SEP, WID, OR DIV: How long were you married before(last)? _____years

6. How old are you please? (HEAD) _____

7. Age of spouse? _____

8. Could you please give me some information about each of your children that live here with you and where they play most often?

(START WITH THE YOUNGEST. RANK TWO PLAY CODES EACH SEASON)

	Age	Grade	Sex	Summer	Winter
1					
2					
3					
4					
5					
6					

play code
1 unit-theirs-inside
2 unit-theirs-outside
3 unit-others
4 project-play space, day care
5 project-other
6 neighborhood-play area,
7 neighborhood-other
8 city
9 don't know

9. Do you have any children NOT living with you? ___yes ___no.

10. Is the HEAD OF THE HOUSEHOLD employed NOW either part-time or full-time? ___no ___yes, part-time ___yes, full time

11. IF "NO", How long unemployed? _____years (___always hsewife, GO TO 14.)

12. Job held previous _____ industry _____

13. How long? _____ years

14. Would it be worth your while to work? ___no ___? ___yes

15. What would it accomplish for you? _____

16. IF EMPLOYED, What type of job? _____ industry _____

17. Number of hours per week? _____

18. How long have you had this job? _____years

19. What was your last job? _____ industry _____

20. How long did you work at that job? _____

21. Is the SPOUSE employed NOW either part-time or full-time?
___no ___yes, part-time ___yes, full-time

22. IF "NO", How long unemployed? _____years (___always hsewife, GO TO 25.)

23. Job held previous _____ industry _____

24. How long? _____years

25. Would it be worth your while to work? ___no ___? ___yes

26. What would it accomplish for you? _____

27. IF EMPLOYED: What type of job? _____ industry _____

28. Number of hours per week _____

29. How long have you had this job? _____years

30. What was your last job? _____ industry _____

31. How long did you work at that job? _____years

32. Where was the HEAD born please? _____(city, prov., etc.)

33. Has the HEAD left the city and returned? ___no ___yes

34. IF "YES": For how long? _____years; Year returned _____(LAST TIME)

35. IF HEAD BORN IN THIS CITY, ASK: Did you live all your life here? ___no ___yes

36. IF HEAD NOT BORN IN CANADA, ASK: What year did you first come to Canada? _____

37. IF HEAD NOT BORN IN ALBERTA, ASK: Alberta? _____

38. IF HEAD NOT BORN IN THIS CITY, ASK: This city? _____

39. And where was the SPOUSE born please? _____

40. Where did each of you spend MOST of your childhood (up to 16)?
HEAD: ___farm ___small town ___city ___other(_____)
: design type _____
: tenure _____

41. SPOUSE: ___farm ___small town ___city ___other(_____)
: design type _____
: tenure _____

42. Since YOU were 16, would you say you've lived MOST your life in:
a) ___farms ___small towns ___cities
b) ___owned ___rented ___even
c) ___multiple-family ___shared houses ___private houses

43. We would like to ask you a few general questions about your health and find out if living here has had any affect on your family.

a) First of all, how would you describe your health generally?
___poor ___fair ___good ___excellent

b) How often do you find yourself worrying about your HEALTH?
___never or hardly ever ___sometimes ___often ___all the time

c) And how often would you say you worry about other things?
___never or hardly ever ___sometimes ___often ___all the time

d) IF MORE THAN "NEVER": What about? _____

e) How often would you say you feel irritable or frustrated?
___never or hardly ever ___sometimes ___often ___all the time

f) IF NOT "NEVER": Has your housing situation affected this at all?
___unsure ___none ___some ___great deal ___completely

IF NOT "NONE": How? (cause) _____

g) Generally speaking, how happy would you say you are these days?
___unhappy ___not too happy ___average ___pretty happy ___very hap.

h) Has your housing situation affected this at all?
___unsure ___none ___some ___great deal ___completely

i) IF NOT "NONE": How? (cause) _____

j) Would you say that your present housing situation has contributed to or aggravated any emotional or physical health problems for your family?
___unsure ___none ___some ___great deal ___completely.

k) IF NOT "NONE": For whom? _____
Health problem? _____
Housing cause: _____

44. Here is a short list of things that people have been telling us about their health. How often would you say that you are bothered by these things? (never, occassionally, frequently, always)
(FOR EACH PROBLEM SCORED MORE THAN NEVER OR ?, ASK IF THE PROBLEM HAS STARTED SINCE THEY HAVE BEEN LIVING THERE.
PLACE A CHECK MARK NEXT TO THOSE PROBLEMS WHERE THEY ANSWER "YES")

a)	trouble getting to sleep or staying asleep	N O ? F A ___
b)	being bothered by nervousness, figety, tense	N O ? F A ___
c)	headaches or other head pains	N O ? F A ___
d)	loss of appetite	N O ? F A ___
e)	upset stomach	N O ? F A ___
f)	difficulty getting up in the morning	N O ? F A ___
g)	ill health affecting the amount of work you can do	N O ? F A ___
h)	shortness of breath when not exercising, working hard	N O ? F A ___
i)	your heart beats hard	N O ? F A ___
j)	spells of dizziness	N O ? F A ___
k)	nightmares	N O ? F A ___
l)	losing weight when something bothers you	N O ? F A ___
m)	trembling hands	N O ? F A ___
n)	sweating hands making you feel damp or clammy	N O ? F A ___
o)	have there ever been times when you couldn't take care of things because you just couldn't get going?	N O ? F A ___
p)	biting your nails	N O ? F A ___
q)	allergies, skin rashes	N O ? F A ___
r)	gaining weight when something bothers you	N O ? F A ___

45. How many cigarettes would you say you smoke a day? _____

46. And about how many hours sleep each night do you feel you NEED? _____

47. And how much sleep do you actually GET? _____ hours each night

48. Do you ever feel lonely? ___never ___sometimes ___very often ___all the time

49. Do you ever feel bored? ___never ___sometimes ___very often ___all the time

50. Do you find it easy or hard to meet new people and make new friends here?
___too hard ___hard ___? ___easy ___too easy

51. Have you made any new friends since moving in here? ___none ___few ___many

52. Generally, would you rather have a few close friends or many who are not as close? ___few friends ___many but not close ___both ___?

53. What ethnic group are you please? _____
(NOTE RACE BY OBSERVATION _____)

54. And would you please tell me what religion you are? _____

55. EDUCATION OF HEAD: SPOUSE:

___none	___
___some or finished elementary	___
___some or finished secondary	___
___some university or degree	___
___technical degree or training	___
___don't know	___

56. I would like to ask you a few questions now about where you have lived in the past. Would you say that your family has moved around quite a bit (THIS MARITAL STATUS) ___no ___yes

57. IF "YES": Location ___same city ___between cities ___both
58. Why have you moved so much? _____
59. Any other reason? _____
60. Number of moves in last 5 years a) ___within cities b) ___between cities

61. If you were planning to move for some reason, do you think you would have any moving problems (lease, storage, schooling, the move)? ___none ___a few ___many

62. "IF NOT "NONE": What problems? (1) _____ (2) _____
63. Would you consider not moving because of such problems? ___not at all ___little bit ___great deal

64. In terms of your needs, if you were planning to move soon, do you think there is much choice in housing available? ___none ___a little ___a great deal ___?

65. What do you think is the situation for most families like yours? ___no choice ___a little choice ___a great deal of choice

66. Please tell me a few things about the LAST place you lived (ANY) MAR. ST.)
- a) city and neighborhood _____
- b) design type _____, number bedrooms _____
- c) tenure _____
- d) shared? _____
- e) rent/mortgage $_____monthly
- f) funding _____
- g) how long did you live in that accommodation? _____years
- h) what year did you move out? _____
- i) generally speaking, how satisfied were you with that accommodation? ___most unsatisfied ___somewhat unsatisfied ___acceptable, average ___better than average ___most satisfied
- j) what do you miss about that accommodation? _____
- k) what are you glad to be away from? _____
- l) what was your marital status then please? _____
- IF NOT THIS CITY m) why did you decide to leave there? _____
- n) of all the cities you could have gone, why did you choose this city as the place to live? _____
- o) why did you choose to move to THIS accommodation? (1) _____ (2) _____

67. Thinking back over ALL the places you have lived in (THIS) MARITAL STATUS, in this city or anywhere else, which accommodation do you think was the BEST overall? (INDICATE IF ___THIS PLACE OR ___LAST PLACE ABOVE AND SKIP TO Q.68)
- a) city and neighborhood _____
- b) design type _____; number bedrooms _____
- c) tenure _____
- d) shared _____
- e) rent/mortgage $_____monthly
- f) funding _____
- g) how long did you live there? _____years
- h) what year did you move out? _____
- i) generally speaking, how satisfied were you with that ___most unsatisfied ___somewhat unsatisfied ___acceptable, average ___better than average ___most satisfied
- j) what did you like about it? (1) _____ (2) _____
- k) why did you move out? _____
- l) what do you miss about living in that accommodation? (1) _____ (2) _____

(___check here if respondent believes there has been no best place)

28. There are a few questions I would like to ask you now about THIS place. Could you tell me first please how you generally go about looking for a place to live? (1) _____ (2) _____

29. How did you find this place? _____

30. How long did it take from the time you applied until you actually moved in here? _____ months

31. From the time you applied, how many other places did you live in while you were waiting to move in here? (DO NOT COUNT WHERE RESPONDENT WAS LIVING WHEN THEY APPLIED) _____ places

32. IF ONE OR MORE PLACES: Did that present any hardships or make things tougher for you? ___none ___a little ___great deal

33. IF NOT "NONE": In what ways? 1) _____
2) _____

34. Were there other places you considered and liked better?
___no ___? ___yes (how many? _____)

35. IF "YES": What was the accommodation you felt was best for you like?
a) city and neighborhood _____
b) design type _____; number bedrooms _____
c) tenure _____
d) rent/mortgage $_____monthly
e) funding _____
f) sharing _____
g) what did you like about it so much?
(1) _____ (2) _____
h) why didn't you move in there? _____
i) do you feel now that you were wrong to settle?
___no ___little bit ___great deal; ___no choice

36. How long did you plan to stay here when you moved in? _____years

37. How long have you lived here now? _____years

38. IF LONGER: Why have you stayed longer? (1) _____
(2) _____

39. IF SHORTER: Do you still plan to leave? ___no ___? ___yes
OR INDEF.

40. How satisfied were you generally with this place when you FIRST MOVED IN?
___most unsatisfied ___somewhat unsatisfied ___acceptable, average
___better than average ___most satisfied

41. What made you feel that way? (unit, devel., neigh., mgmt., people, etc.)
(1) _____ (2) _____

42. Are those things as (dis)satisfying today?
___much less ___less ___same ___more ___much more

43. Generally speaking, how do you feel about this place NOW?
___m. us. ___s.us. ___av. ___bet. av. ___m. sat.

44. Why do you feel that way? (1) _____ (2) _____

I am now going to read you a list of things that people have told us they are happy with in their UNIT or that they have complaints about. How satisfied are you with each of these in your UNIT?

	SATIS.	PROBLEM	LOC.	SOLUTION
a) heating				
b) ventilation				
c) natural light				
d) artificial light				
e) sleeping areas				
f) kitchen				
g) eating area				
h) bathrooms				
i) laundry facilities				
j) indoor stairs				
k) outdoor stairs				
l) elevator (if app.)				
m) number of rooms				
n) size of rooms				
o) fire safety				
p) vandalism				
q) mugging, violence				
r) theft				
s) project lighting				
t) odors--indoor				
u) odors--outdoors				
v) maintainance				
w) garbage system				
x) soundproof--within				
y) soundproof--between: everyday sounds				
z) soundproof--between: unusual (parties)				
aa) looks of project				
bb) fencing				
cc) landscaping				
dd) is it well built?				
ee) pets				
ff) paint				
gg) carpet				
hh) lino				
ii) fixtures				
jj) ceramic tile				
kk) police service				
ll) damage deposit				
mm) project open spaces				
nn) project as a whole				

CODES:

Satis.
1 not satisfied
2 partly satisfied
3 satisfied

Problem
specify

Location
1 R's unit
2 close unit
3 project
4 neighborhood
5 city

Solution
1 do nothing
2 nothing possible
3 people
4 management
5 police
6 design changes
7 construc stds.
8 government
9 other (specify each time)

How many of those things would you say bother you but not others?

___none ___few ___many ___all

IF NOT "NONE": Why do you think it (they) just bother you?

_____

88. If you had your choice when you first moved in, would you have wanted to rent or buy your unit? ___rent ___? ___buy

89. If you had the choice NOW to rent or buy your unit, which would you do?
___rent ___? ___buy; ___move out

90. If you had it to do all over again, would you still move in here?
___def. not ___no ___? ___yes ___def. yes; ___no choice

91. Generally speaking, would you say that your needs are mostly met here?
___none ___some ___most ___all

92. Which needs are BEST met here? (1)_____ (2)_____

93. Which needs are NOT met here? (1)_____ (2)_____

94. What would you say makes you MOST proud of where you live now?
(1)_____ (2)_____

95. And what would you say makes you LEAST proud of where you live now?
(2)_____ (2)_____

96. What improvements, if any, have you made to your accommodation since you have been living here (fence, landscaping, panelling, etc.)?
(1)_____ (2)_____

97. What improvements do you plan in say the next year?
(1)_____ (2)_____

98. If you were planning to move, would you consider living in government-supported housing again?
___def. not ___no ___? ___yes ___def. yes

99. Why? (1)_____ (2)_____

100. Generally speaking, when you think about your family living here, which statement best describes your thoughts?

___we are stuck here and hate it
or ___we're not attached to this place and are looking forward to leaving
or ___we are content to stay here but wouldn't be sorry to go
or ___we like it here and would be sorry to leave

101. A very important part of this study deals with children. Some people in other developments have told us that they have problems with younger children and teenagers. Do you?
___none ___nothing unusual ___some ___many

102. IF NOT "NONE": Whose children are they? (CHECK ALL THAT APPLY)
___respondent's ___within project ___neighborhood

103. What types of problems do they cause?
(1) _____ age of offenders _____
(2) _____ age of offenders _____

104. Why do you think you have this problem? (RANK 3)
(1) ___number of children around (2) ____
___lack of supervision by parents ____
___lack of control by management ____
___design of the development (_____) ____
___lack of recreation programs, things to do ____
___other (_____) ____

105. Would you say you keep closer watch on your children's activities than your neighbors or others in the development do?
___far less than neighbors ___less ___? ___more ___far more

106. IF "MORE" OR "FAR MORE": Why are you able to do this do you think?
(1) _____ (2) _____

107. About how much of the time would you say you know where your children are?

	none	very little	some	most	all the time (SKIP TO 109.)
preschoolers					
6-12					
teenagers					

108. And how much MORE time would you like to know where your children are?

	none	very little	some	most	all the time
preschoolers					
6-12					
teenagers					

109. Some people have told us that people with children should not live in developments like this for very long, and others have told us that this type of living is very good for children. How long do you think that people with children should live in THIS development?
a) pre-schoolers _____ years
b) 6-12 _____
c) teenagers _____

110. Do you consider the recreation facilities to be adequate in the development for your family?

	very inad.	inadeq.	aver.	adeq.	very adeq.
preschoolers					
6-12					
teenagers					
adults					

111. In what ways? preschoolers? _____
6-12? _____
teenagers? _____
adults? _____

112. Do you think there is a need for day-care facilities: (CHECK ALL THEY WANT)
___on-site? ___somewhere else in the neighborhood? ___where you work

113. IF "YES" TO ANY: Should the cost of the service be part of the services provided in the development or should it be an extra cost to those who use it? ___part ___extra ___? ___either

114. In what ways would you say your unit and this development are not safe for children? (INDICATE IF "NONE")

a) inside unit (1)_____ (2)_____

b) on devel. (1)_____ (2)_____

115. Do your children's friends live mostly in this development or out of it?

RANK ACROSS

preschoolers	___devel	___neigh.	___city	___?
6-12	___	___	___	___
teenagers	___	___	___	___

116. Who looks after your children when you (parents) are working or away?

___never away
___kids old enough to stay alone
___day care
___relatives
___people in neigh., devel.
___nobody
___take them with us

RANK 3

117. Could you tell me please if you are PLANNING a move in the next year or two? ___no ___yes ___uncertain

118. IF "YES": a) Where to? (city and neigh) _____
b) Design _____; number bedrooms _____
c) Tenure _____
d) Why are you leaving this accommodation?
(1) _____ (2) _____
e) Of all the places available, why did you choose that particular accommodation?
(1) _____ (2) _____

(SKIP TO Q.121.)

119. Would you LIKE to move in the next year or two?
___no ___? ___yes

120. IF "YES": a) city and neigh. _____
b) design _____; number bedrooms _____
c) tenure _____
d) rent/mortgage _____monthly
e) sharing _____
f) funding _____
g) why would you prefer that accommodation? _____
h) why aren't you living there now? _____

121. People have told us a lot of different things that are important to them in choosing a place to live. When you think about all the things that you have mentioned so far, which of these would be important to you?

a) the design and facilities of your unit?	N	?	Y
b) the design and facilities of the overall project?	N	?	Y
c) the type of people in the project?	N	?	Y
d) the neighborhood the project is in?	N	?	Y
e) the amount of rent you would be paying?	N	?	Y
f) how close it is to friends and relatives?	N	?	Y
g) the quality of maintainance, management?	N	?	Y
h) it was government supported housing ?	N	?	Y

122. Which three aspects are the most important to you? (1)____ (2)____ (3)____

123. Given your needs, which of these programs do you think government should do more work with?

a) fixing up older neighborhoods	N	?	Y
b) building more public housing	N	?	Y
c) building more private low-rental units	N	?	Y
d) building more low-price condominium units	N	?	Y
e) longer term, lower interest mortgages	N	?	Y
f) tax forgiveness (defer property taxes)	N	?	Y
g) fixing up existing houses	N	?	Y
h) rent subsidies	N	?	Y
i) bylaws to permit more duplexing	N	?	Y
j) other (_____)	N	?	Y

124. Which of these programs would be of most help to your family in your present situation?

(1)_____ (2)_____ (3)_____

25. Let's suppose that it was also possible for you to make changes in your present personal situation. If it were possible for you to make some changes BUT YOU WOULD STILL LIVE HERE, in which of these areas would you like some changes:

a) financial situation?	N	?	Y
b) family situation?	N	?	Y
c) design and facilities of your unit?	N	?	Y
d) design and facilities of your development?	N	?	Y
e) the people right around you?	N	?	Y
f) other people in the development?	N	?	Y
g) facilities in the surrounding neighborhood?	N	?	Y
h) the people in the surrounding neighborhood?	N	?	Y
i) changes in the management here?	N	?	Y

26. Which of these changes would be of the most help to your family?
(1)_____ (2)_____ (3)_____

27. If your only choice could be your first choice of (_____ q.124) and your other first choice of (_____ q.125), which would be MOST important to you? ___q.124 ___q.126 ___? ___either

28. Let's talk about the people in the neighborhood around here for a minute. Do you know if they were AGAINST this development before it was built?
___strg. opp. ___opp. ___? ___in fav. ___strg. in fav.

29. Do you know why (not)? _____

30. Would you say that people in this neighborhood are AGAINST this development NOW?
___strg. opp. ___opp. ___? ___in fav. ___strg. in fav.

31. Do you know why (not)? _____

32. Some people have told us that they think people outside their development treat them differently because they live in that development. Does that go on around here?

___never ___sometime ___? ___most of time ___all the time

32. IF "MOST" OR "ALL"TIME: What is it about this development do you think that makes them act that way? (RANK 3)

___looks of the development
___type of neighborhood the development is in
___number of people living here
___type of people living here
___type of people who do the complaining
___other (_____)
___other (_____)

33. Do you agree with them? ___s.d ___d. ___? ___a. ___s.a.

34. Which of these statements do you agree with when you think about living here

a) the landlord looks down on us.	SD	D	?	A	SA
b) people in this neighborhood think the tenants here are less intelligent and not as hard working as they are	SD	D	?	A	SA
c) people in this neighborhood think the tenants have a different standard of living than they do	SD	D	?	A	SA
d) I don't like to say I live in this development	SD	D	?	A	SA
e) people around here don't like us	SD	D	?	A	SA
f) I am embarrassed to invite people over here	SD	D	?	A	SA

135. Could you please tell me how much rent (or mortgage) you pay each month?
$_____monthly

136. Does that include any utilities? ___no ___yes

137. IF "YES": Which utilities? _____:_____:_____

138. IF OWNS: Does that include any taxes? ___no ___yes

139. About how much are your taxes each month? $_____

140. In terms of your resources, is this the rent (or mortgage) that you can afford? ___no ___yes

141. What utilities do you pay for that are NOT part of your rent (or mortgage)?
a) lights, water $_____monthly
b) heat _____
c) phone _____
d) parking _____
e) cable t.v. _____
f) other (_____)

142. Not including any taxes or utilities, how much would you say your upkeep costs, let's say for last year? $_____
(maintainance, repairs, etc.)

143. In what ways would you say this place is most like a house to your family?
(1)_____
(2)_____

144. Does your unit allow you to arrange your furniture the way you like?
___none of it ___some of it ___most of it ___all of it

145. What things do you have problems storing or keeping out of the way?
(1)_____ (2)_____ (3)_____ (4)_____

46. Sometimes it helps to think about each member of the family to help sort out how developments for many families can be improved. What really good thing comes to mind about this development when you think about:

male head _____

47. And what would be his major complaint? _____

48. COMPLETE THE FOLLOWING

FOR RELEVANT FAMILY MEMBERS	Good Point	Complaint
female(head)		
pre-schoolers		
6-12		
teenagers		

149. What advantages and problems are there for your family because you live in this part of the city?

ADVANTAGES
- male head _____
- female (head) _____
- pre-schoolers _____
- 6-12 _____
- teenagers _____

PROBLEMS
- male head _____
- female (head) _____
- pre-schoolers _____
- 6-12 _____
- teenagers _____

150. Would you move just to be closer to those things? ___ no ___ ? ___ yes

151. In what ways, if any, would you say that living here has helped you or other members of your family better themselves?
(EXAMPLES: SAVING MONEY, EDUCATION, FAMILY RELATIONSHIPS)

(1) _____

(2) _____

152. Here is a list of specific things that people have told us are better or worse for their family since moving in here. Would you say that living here has made these things better or worse for your family than where you lived last?

	much wse	worse	same	better	much be
a) state of mind					
b) health					
c) saving money					
d) raising children					
e) privacy					
f) generally better living					
g) relationships with neighbors					
h) relationships with spouse (if app)					
i) hobbies, recreation					
j) keeping the place clean					
k) making friends					
l) amount of space you have					
m) freedom to act as you like					
n) other (_____)					

153. Which of those things do you think would be better or worse if you were living in a house instead of here?

	much worse	worse	no chg	better	much better
a) state of mind					
b) health					
c) saving money					
d) raising children					
e) privacy					
f) generally better living					
g) relationships with neighbors					
h) relationships with spouse (if app.)					
i) hobbies, recreation					
j) keeping the place clean					
k) making friends					
l) amount of space you have					
m) freedom to act as you like					
n) other (_____)					

154. When you are in your unit, how often can you see or hear the activities of your neighbors?

___never, hardly ever ___sometimes ___often ___very often,always

155. IF "SOMETIMES" OR MORE: How much does that bother you?
___none ___some ___average ___great deal ___completely

156. And when you are in your own unit, how often can you see or hear the activities of other people IN YOUR unit?

___never,hardly ever ___sometimes ___often ___very often, always

157. IF "SOMETIMES" OR MORE: How much does that bother you?
___none ___some ___average ___great deal ___completely

158. Let's look at it another way. How often do you feel you have to do things more quietly than you would like, or not do them at all, because you are afraid you may disturb your neighbors?
___never, hardly ever ___sometimes ___often ___very often,always

159. IF "SOMETIMES" OR MORE: How much does that bother you?
___none ___some ___average ___great deal ___completely

160. And how often do you feel you have to do things more quietly, or not do them at all, because you are afraid of disturbing other people right inside YOUR unit?

___never, hardly ever ___sometimes ___often ___very often,always

161. IF "SOMETIMES" OR MORE: How much does that bother you?
___none ___some ___average ___great deal ___completely

162. When you think of the different activities your family gets involved with, which ones stand out in your mind that you can do with all the privacy you like here?

(1)_____ (2)_____ (3)_____

163. And which activities come to mind that you don't do or have trouble doing because you don't have the privacy you would like?

(1)_____ (2)_____ (3)_____

164. Another thing that people have been telling us about is that sometimes they feel that there are too many people around. Do you feel crowded when you think of your:

	never	rarely	sometime	most time	always
a) unit?					
b) (bldg.)?					
c) devel.?					
d) neigh.?					

165. How many units do you think there should be in a development like this?
___far less ___less ___same ___more ___far more ___?

166. Should developments like this be concentrated in a few areas of the city or should they be scattered? ___concentr. ___? ___scat. ___eith. ___bth.

167. Should developments like this be in newer areas or should they be built in more established, older parts of the city?
___older ___newer ___? ___either ___both ___other(_____)

168. Should developments like this be built in areas where people in the surrounding neighborhood have the same income or in areas where there is a mix of incomes?
___same ___mix ___? ___either ___both ___other(_____)

169. Should developments like this be built in the downtown area or should they be further out?
___downtown ___further out ___either ___both ___other(_____)

170. Should developments like this be built at all?
___definitely not ___no ___? ___yes ___definitely yes

171. Let's talk for a moment about your transportation needs. Does your family have a car that works all year round? ___no ___yes (# _____)

172. IF "NO": What things do you have trouble doing because you are without a car? (1)_____ (2)_____

173. Does the parking situation here satisfy your needs? ___no ___? ___yes

174. In what ways? (1)_____ (2)_____

175. Do people have difficulty finding where this development is? ___no ___yes

176. Once people find the development, do they have trouble finding where your unit is, where you live? ___no ___? ___yes

177. IF "YES": What do you think is the best solution? _____

178. Do you think that the units across from you should be closer or further away?
___much further ___further ___o.k. now ___closer ___much closer

179. Do you have private yard space? ___no ___yes

180. IF "NO": Do you wish you had some? ___no ___yes

181. IF "YES": Is it large enough? ___no ___yes

182. Does it give you any problems? ___no ___yes

183. IF "YES": What problems?1)_____ 2)_____

184. Is it private enough? ___not at all ___partial ___complete

185. Are you the type of person that is bothered by noises of other people?
___definitely not ___no ___? ___yes ___very much so

186. Is it too easy for your neighbors to see what you are doing?
___definitely not ___no ___? ___yes ___very much so

187. Compared to others in the units around you, would you say you value privacy more or less?
___far less ___less ___same ___more ___far more

188. Again, compared to others in the units around you, would you say you value being neighborly more or less?
___far less ___less ___same ___more ___far more

189. Earlier we talked about the rent you are paying for this accommodation. For the rent you are paying, do you think you are getting your money's worth in terms of:

	def. not	no	averaged	yes	def. so
a) your unit?					
b) your development?					
c) your neighborhood?					

190. Would you mind telling me about what percentage of your FAMILY NET OR TAKE-HOME pay goes for your rent? _____%

191. What is the source of your income please?
____%employment
____%social assistance
____%alimony
____%other (_____)

192. Given all your needs, is your total monthly family income enough?
__far too low ___little low ___average ___better than average __high

193. IF "TOO" OR "LITTLE" LOW: How much more a month do you need? $____ MORE

194. How would you use this extra money? (1)_____
(2)_____

195. Would you want the cash to pay for these things yourself or would you rather that somepody pay it for you?
___cash ___? ___pay for me

196. Do you think that the rent scale here is fair?
___very unfair ___unfair ___? ___fair ___very fair

197. Why? _____

198. Do you find your lease confusing? ___no ___partly ___mostly ___no lease

199. What areas should be clearer? (1) _____ (2)_____

200. I'd like to talk to you now about the kinds of things that you get involved with around here. Some people seem to get together more with others in their development while others get together with people that live other places. Which do you do? (CHECK ALL THAT APPLY)

	Devel	Neigh	City	MOST(D,N,C)
a) chat on the phone				
b) exchange favors, parcels				
c) visit informally				
d) ask advice				
e) go to parties, movies				
f) help with meals, housework				
g) pick up things at stores				
h) care for children				
i) help out if sick				
j) borrow or lend groceries				

201. Would you say that most of your close friends live in: (RANK 2)
____development ____neighborhood ____city ____other

202. Would you say that most of your relatives live in: (RANK 2)
____development ____neighborhood ____city ____other

203. How many of the families around you would you say you like?
___none ___some ___about half ___most ___all

204. We would like to know something about the kinds of things you like to do. Please tell me how often you generally get involved with these things:

		Never	Sometimes	Often
a) indoor hobbies like knitting or sewing	a			
b) outdoor hobbies like gardening	b			
c) watching t.v.	c			
d) reading (newspapers, books)	d			
e) going to movies	e			
f) drawing or painting	f			
g) playing cards or other table games	g			
h) going to the park or the zoo	h			
i) going to special lectures or classes	i			
j) going to sports events	j			
k) going to plays or concerts	k			
l) participate actively in formal organizations	l			
m) participate actively in volunteer work	m			
n) workshop activities	n			
o) going out to visit	o			
p) having a few people in to visit	p			
q) listen to the stereo	q			
r) going for walks or drives in the car	r			
s) cooking outside	s			
t) going for picnics	t			
u) going fishing, hunting, or camping	u			
v) having large parties	v			
w) sunbathing	w			
x) going to church	x			

205. Which of those things, if any, would you like to do MORE but cannot? (PANK)

	REASON CAN'T DO MORE	BOTHER YOU? none	some	av.	great deal	complt
1) item ___						
2) item ___						
3) item ___						
4) item ___						
5) item ___						

206. What NEW things would you say members of your family can do now because this is the place you live?

(DAY, NIGHT, SUMMER, WINTER, INSIDE, OUTSIDE)
(design reasons, neighbors, mgmnt.)

male head _____ Why? _____

female (head) _____ _____

pre-schoolers _____ _____

6-12 _____ _____

teenagers _____ _____

207. And what activities have you had to GIVE UP because this is where you live?

male head _____ Why? _____

female (head) _____ _____

pre-schoolers _____ _____

6-12 _____ _____

teenagers _____ _____

208. When you want to be by yourself, can you?
___never ___rarely ___sometimes ___most of the time ___whenever

209. IF "MOST.." OR "WHENEVER": Where do you go? _____

210. IF "NEVER" OR "RARELY": Would you like more chances to be alone?
OR "SOMETIMES" ___never ___rarely ___sometime ___most time ___alway

211. Through the week, how many hours in an average week would you say you are able to be away from home?
____hours employment ____hours errands, shopping ____hours leisure

212. How many MORE chances would you like to get out during the week?

	none	once a week	2 or 3 times/week	daily
for work				
for errands, shopping				
for leisure				

213. How often are you or your whole family able to get away for a weekend or vacation?
___never ___once a year ___every few months ___at least once a month

214. We are very much interested in the rules and regulations around here. Some people we have talked to have complained about the number of rules while some have told us they wished there were more.
First of all, do people generally go by the rules around here?
___never ___sometimes ___?___most of the time ___all the time

215. How are people who break the rules generally dealt with? (RANK)
___nothing is done ___asked to follow rules ___evicted

216. Does it work (help)? ___never ___sometimes ___always

217. To your mind, should there be more rules on some things?
___same number ___few more ___many more

218. IF MORE THAN "SAME": In what areas? (1) _____ (2) _____

219. To your mind should there be fewer rules on other things?
___same number ___few less ___many less

220. IF LESS THAN "SAME": In what areas? (1) _____ (2) _____

221. Would you say that people here generally are considerate toward each other?
___very inconsid. ___inconsid. ___average ___consid ___very consid.

222. Could you give me some examples? (1) _____
(2) _____

223. Would you say your family is different from the majority of families in the development? ___same ___diff. some ___diff. many ways __dif.all

224. IF NOT "SAME": In what way?(1)_____ (2)_____
(WE ARE .....)

225. Would you say that your family is any different than families that live in the surrounding neighborhood?
___same __diff. some ways ___diff. many ways __diff. all ways

226. IF NOT "SAME": In what ways are people in the development different?

(WE ARE:) (1)_____ (2)_____

227. Let's say you had a complaint about one of your next door neighbors that wasn't very serious. What would you do about it?
(CHECK ALL THAT APPLY)
___nothing ___bang on wall ___neighbor ___mgmt ___police

228. Have you tried that way before? ___no ___yes

229. IF "YES": Did it work? ___no ___yes ___?

230. IF "YES": Would you say that: ___the problem is gone
___you put up with it
___you still complain

231. What was the problem? _____

232. What would you do if your complaint about your neighbor was very serious?
___nothing ___bang on wall ___neighbor ___mgmt ___police

233. Has anything happened or could anything happen to make you do that?
___no ___? ___yes

234. IF "YES": What happened? _____
235. Did it work out to your satisfaction? ___no ___? ___yes

236. Has anybody complained about your family to you personally or to the management in the last year?
___never ___once or twice ___more often

237. IF ONCE OR MORE: What was their complaint? (1)_____
(2)_____
238. Was it justified? (1)_____ (2)_____ (NO OR YES)

239. Can you think of any old complaints that you have had that were never dealt with properly but that you just got tired of trying to do something about? ___no ___yes ___?

240. IF "YES": What was that complaint? _____

241. When did it start up? _____

242. How does it affect you now? _____

243. Do you seem to have more or less complaints than you did say a year or two ago (or when you moved in?)?
___less ___same ___more

244. IF "MORE" OR "LESS": Why do you think so? _____

245. Which of the following do you think best describes how you feel other people SHOULD live in developments like this one?

a ___live and let live (you do as you want and so will I)?
or b___rules and regulations should be established and enforced?
or c___ specify (_____)

246. Which statement seems to fit best how your neighbors and others near you live NOW?

247. Do you know if there is a tenant's organization in the development?
___no ___? ___yes

248. IF "YES": Are you a member? ___no ___yes

249. Do you participate? ___no ___sometimes ___active

250. How active is the group?
___inactive ___not very active ___? ___active ___very active

251. Do you think the group is worthwhile? ___no ___yes

252. Why (or why not)? _____

253. IF "NO": Would you like to see such a group organized? ___no ___yes

254. Do you think tenants should be involved in:

a) development of social and recreational programs? ___no ___? ___yes
b) maintainance programs? ___no ___? ___yes
c) handling tenant complaints? ___no ___? ___yes
d) management of the development(rent collection,etc) ___no ___? ___yes
e) policy-making (sitting on housing boards)? ___no ___? ___yes
f) deciding where projects will be located? ___no ___? ___yes
g) deciding on the design of projects? ___no ___? ___yes
h) construction standards for projects? ___no ___? ___yes
i) setting budgets for maintainance, etc. ___no ___? ___yes

255. Generally speaking, what changes would you recommend in the administration of projects like this now?(management, supervision, etc.)

(1) _____

(2) _____

(3) _____

256. Generally speaking, how would you say relationships are between management and the tenants now?
___very poor ___poor ___average ___good ___very good

257. What has happened to make you say that? _____

256. Who do you call now if you have a maintainance problem? (check all applic.)
___handle yourself ___tenant group ___mgmt ___private company

259. What way do you think would be best?
___handle yourself ___tenant group ___mgmt ___private company

260. Here are some things that people have been telling us. I wonder which of them you would agree with?

a) There's little use writing to public officials because often they aren't really interested in the problems of the average man SD D ? A SA

b) Many younger people who get welfare are just too lazy to work SD D ? A SA

c) Nowadays, a person has to live pretty much for today and let tomorrow take care of itself SD D ? A SA

d) In spite of what some people say, the lot of the average man is getting worse, not better SD D ? A SA

e) The government controls too much of our lives these days SD D ? A SA

f) It's hardly fair to bring children into the world with the way things look for the future SD D ? A SA

g) These days a person really doesn't know who he can count on SD D ? A SA