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THE RELATIONSHIP BETWEEN THE ELDERLY'S HOUSING PREFERENCES AND THEIR DEMOGRAPHIC CHARACTERISTICS: A CASE STUDY IN MULTIVARIATE STATISTICAL ANALYSIS

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INTRODUCTION

The elderly's housing needs have been the subject of a large volume of literature crossing many disciplines over the past two decades. Much of this literature has focused on such diverse topics as the advantages stemming from integrating the elderly with more diverse populations versus the advantages of segregating the elderly into homogeneous clusters Rosow [7], the mobility characteristics of elderly populations and their resulting choices of living accommodations Golant [3], the morale and life satisfactions of the elderly under various and diverse housing modality features Heslin [4], and the choices of housing features to meet the particular needs of elderly populations with respect to the differing health and physical characteristics of those populations Carp [2].

The literature is far from conclusive due to the various purposes for which the research was being conducted and to the complexity of issues. For example, one of the leading researchers in this area Rosow [6, 7, 8] has argued that there has been far too much attention paid to the physical arrangements of elderly housing units and too little attention paid to the social environment of the elderly. The loneliness that is customarily attributed to the elderly due to the drastic changes that they confront during the aging process (e.g., through the loss of friends and personal health) is not a uniform phenomenon according to Rosow. It is a problem for those living alone, but less so for those that live under conditions that allow for high degrees of social interactions. Rosow found that previous research consistently emphasized a distinct preference on the part of sampled elderly populations for interaction with others of their own age as opposed to interaction with younger individuals. Rosow concludes that peer group proximity enhances social interaction on the part of the individual, and consequently, it also enhances the morale of these individuals.

Out of the concerns and analysis presented by Rosow came what is now a popular set of hypotheses generally falling under the title, "Activity Analysis." These explanations for elderly behavior and resulting levels of satisfaction with their lives will be discussed in some detail in the next section of this paper.

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A related hypothesis holds that various housing modalities allow for (or even encourage) differing levels of social interaction between these modalities' inhabitants. Here, it is suggested that differences in the amounts of interaction that takes place between elderly individuals leads to differences in their life satisfaction and morale. Therefore, it is predicted that elderly populations, living in different housing modalities, will exhibit different levels of satisfaction and morale.

At least one significant study Heslin [4] attempted to test this prediction. The population for his research consisted of elderly women living in one of four different modalities. Each modality was characterized by a different tenant density pattern.

Heslin found that the four housing modalities resulted in significantly different levels of social interaction. This difference was as expected with higher interaction occurring in high population density modalities and lower interaction occurring in lower density modalities. The result was more pronounced for the lower reaches of the elderly age spectrum than for those over 75 years of age. The latter group displayed less interaction characteristics in all of the modality types.

No matter what the age, those respondents displaying higher levels of social interaction also displayed lower levels of alienation that is thought to result from social isolation. These respondents also displayed generally higher levels of life satisfaction. The implication is that the housing modality chosen does at least allow for, if not encourage, increased morale and decreased alienation.

In a work from a slightly different point of view Lawton [5], the implications of housing type and elderly satisfaction were investigated with an orientation to planning for optimal housing arrangements, i.e., arrangements that most nearly satisfy the needs of the population they are designed to serve. In this study, the competence (physical and mental) of the individual was linked to that individual's ability to adjust to new situations. According to Lawton, it is this competence level that should be investigated by policy makers. Housing arrangements could then be differentiated on the basis of these investigations. A screening procedure is implied whereby the housing modality would be determined by a prearranged competence criteria. This type of program would preclude the planning for housing on the basis of integration-segregation criteria alone. Rather, this criteria would measure individual capabilities and the resulting housing needs.

Finally, a comprehensive view of elderly living patterns from a spatial point of view was taken by Golant [3]. In an attempt to link changes in the life patterns of aging individuals to changes in location and transportation choice in Toronto, Canada, Golant concluded that there was a significant difference in the spatial behavior pattern of individuals in different chronological groups. There were also a number of variations in this form of behavior that could be linked to age related social factors. A great deal of variation in both of these respects can be linked to the structure of the urban environment as it affects social arrangements through constraints imposed by costs, locations, types, and sizes of housing units. The transportation structure confronting an

individual in making location decisions plays a significant role in establishing the degree of isolation, morale and social alienation.

Scope and Objectives of Paper

This paper attempts to reconstruct activity theory, which was generally developed by sociologists, into an economic framework utilizing traditional microeconomic tools. An indirect test of this theory will be applied using data collected for a specific elderly population in the City of Duluth, Minnesota. Implications from the empirical model and the theory will be cited as they relate to low income housing units for the reference population.

The contention of this paper is that the debates in the literature, along with their accompanying data sources, are significant to public policy with respect to housing the nation's elderly. This is particularly true where the federal government is building public assisted housing to be offered at reduced rates to the low income elderly. By discerning patterns of housing, these government expenditures are more certain to enhance the satisfaction of this population through appropriate alterations in the physical structures. The literature seems to suggest that this is true and it becomes a worthwhile research activity in particular when this research relates to housing units that are supposedly designed to alleviate specific problems of an identifiable population.

This latter statement may seem to be in contrast to the notions of Rosow in terms of the importance of housing in elderly alienation. However, it seems reasonable to say that what may be true for the heterogeneous elderly population in Rosow's analysis may not be as valid when applied to one segment of that population. In this survey, the population has expressed dissatisfaction with current arrangements by the very act of applying for public accommodations. Federal law that provides for these accommodations requires that the needs and desires of the recipients of this program be taken into account. Rosow, Heslin, Golant and Lawton provide the theoretical framework under which this requirement might be satisfied.

The Economics of the Activity Analysis: The Process of Aging

Activity theory encompasses much of the literature cited above as it relates to the important set of issues concerning the gradual process by which an aged individual is segregated from the normal functions and activities of society. This theory looks at aging as a developmental process with the individual gradually withdrawing from society as he or she is no longer able or welcome to participate in those activities considered to be normal to the middle-aged individual. The way in which the aging individual adapts to this process (and to the implied physical and psychological manifestations of that process) determines to a large extent the social health of that person in terms of his or her being able to cope with old age.

It should be emphasized that segregation, along with the reduced social interaction that this segregation implies, is not voluntary on the part of the individual being subjected to the process. It is, rather, an imposed condition.

The individual is thought to hold on to the interactive activities established during middle age for as long as possible. The constraints are, in large measure, external to his or her decision patterns.

What seems to be occurring during this aging process is that the costs of social interaction and social activities are continuously increasing as the individual leaves middle age status. These increased costs may be related to physical deterioration, such as occurs when the individual is no longer able to drive a car or afford certain club memberships. These costs may also be social, such as when younger individuals require a larger financial and temporal commitment by the aged in order to participate in any given social activity. Finally, it may be due to the loss of income generating capabilities on the part of the individual as he or she moves into retirement, or perhaps, due to the loss of an income earning spouse.

These degrees of disengagement from society are externally generated. An individual's levels of activity should be the best indicator of that individual's desire for future interaction. Activity that is less than this predicted level during old age implies a loss of satisfaction from imposed barriers to further activity.

Activity analysis is capable of being depicted through the use of simple indifference curve models, Bilas [1]. Two models will be presented to analyze the aging process described by activity analysis. The first emphasizes the disengagement that is forced on the individual due to increases in the price of social interaction. The second demonstration includes the additional constraint that is imposed by income losses that often accompanies old age. Some implications for social behavior and consumer satisfaction will follow in an attempt to establish a testable hypothesis with respect to elderly activity and related preferences for housing modalities.

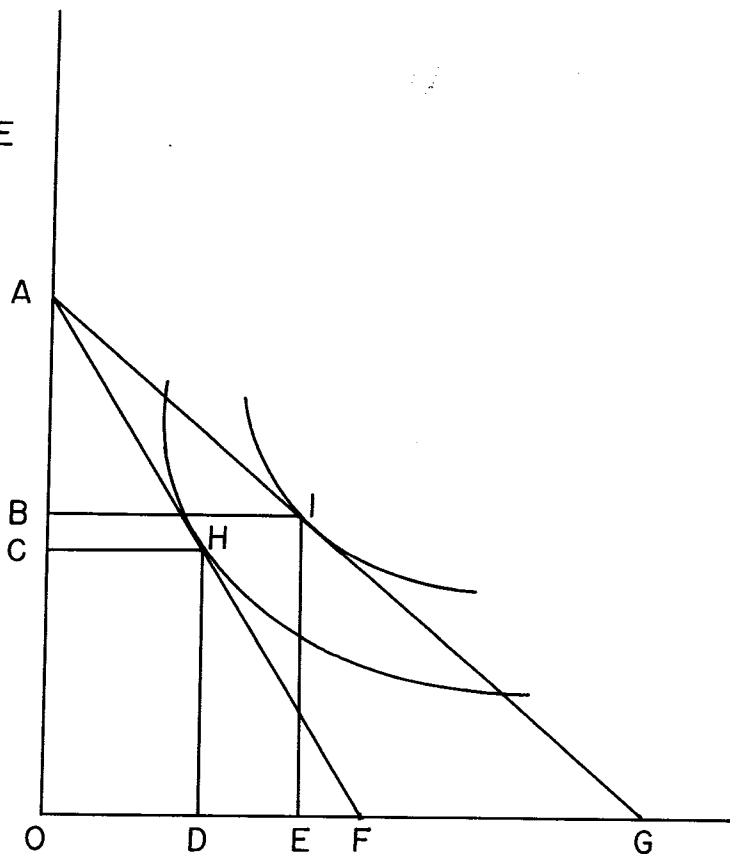
Forced Disengagement

Diagram 1 illustrates the forced disengagement hypothesis.¹ Activity theory explains this as being a condition imposed upon the individual through the process of biological deterioration or through social constraints imposed against the elderly. If the individual's original budget constraint line² is described by line AG in Diagram 1, the process of aging should have the effect of rotating that line towards AF according to the activity hypothesis. The individual would respond with decreases in the amount of social interaction and increases in expenditure on this set of activities. Here the original income expenditure was equal to line segment AB. After the rotation, the income expenditure becomes AC, representing an increase of BC units of expenditure.

¹The results of this diagram demonstrate a case where the elasticity of demand for interaction is less than one. There is, at this time, no a priori reason to suppose that this is a necessary condition of the elderly. The figure in this instance is nearly representative.

²Footnote on the following page.

INCOME



UNITS OF
INTERACTION

DIAGRAM I

In other words, the individual is forced to pay out a larger amount of his or her income for a lesser consumption of interaction, and incidentally, for less total satisfaction. It should be obvious that any program designed to reduce the rate of increase in the price of interaction would serve to enhance this individual's level of social interaction, and therefore, his or her general level of satisfaction. The Heslin results noted above would seem to support this conclusion.

Forced Disengagement Coupled with Income Loss

It is not a very great extension of the previous analysis to include the possibility for loss of income and its effects on the individual's level of satisfaction. In Diagram II, as in the previous situation, the price of social interaction is increasing with age, from OH towards OF on the horizontal axis. In addition, the individual is realizing a money income loss that is depicted by the distance AB on the vertical axis of the diagram. As was true in the previous case, the individual is forced to spend additional amounts of income than was previously required in return for less social interaction and less satisfaction. A governmental policy of transferring to the individual enough income to make up for the loss due to retirement or due to other common aging phenomena would still not leave the individual as well off as he or she was prior to aging because of the price increase that has already been noted in some detail.

In both cases, predictable patterns of preferences on the part of the individuals should be noted if the theory is valid. The most general prediction has already been stated: If activity analysis is valid, the elderly should prefer any situation that would serve to lower the price of interaction with others of their own age. Further, the preference for interaction possibilities should increase with age since the price of that interaction is an increasing function of the aging process. Further, the need for interaction possibilities should be greater for those with lower incomes since they would have more difficulty affording the now higher priced interaction activities. Finally, the desire for interaction possibilities should be a positive function of present activities, i.e., those that express high levels of interest in current interaction should prefer situations that allow these same levels in the future.

One area in which this hypothesis is testable is in the area of housing modality choice. Following the lead of Heslin, and if activity analysis is

²The budget constraint line represents a trade-off relationship between any two classes of goods. The slope of the line reflects the relative price of these two goods. In the example above, the two goods are income and units of social interaction. The extreme points in Diagram I of A and G represents the maximum amount of each good that can be obtained when zero units of the competing good are consumed. Any intermediate point represents the amount of either one of these goods the consumer can obtain given the consumption level for the other good. Thus, when the price of interaction increases, the maximum amount that the consumer can obtain decreases, in this case from OG to OF.

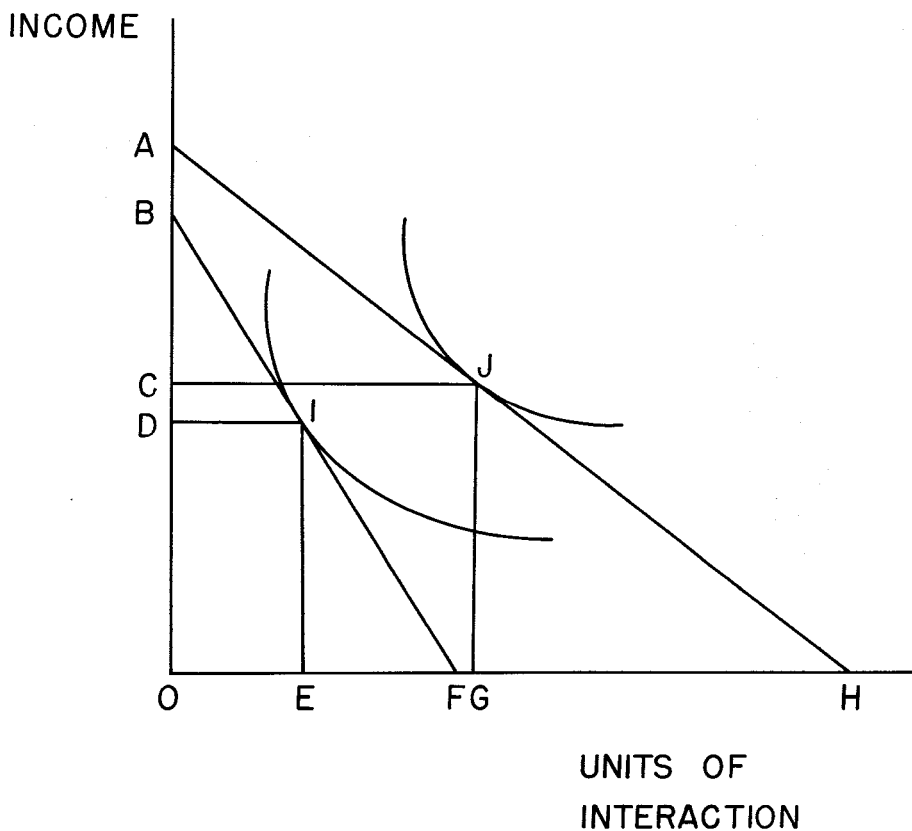


DIAGRAM II

valid, the choice of housing modality should be a function of age, income, and current activity, presuming that housing modalities differ in terms of their allowance for interaction. For example, it may be presumed that high-rise housing allows for a maximum of interaction both because it congregates a large number of individuals in one dense area and because it allows for ease of transportation (an elevator) between the various dwelling units that it contains. It also provides a large enough mass to make public transportation viable. This has the effect of lowering the cost of interaction across town. Separated housing allows for the least interaction in this regard. Finally, motel types of dwellings mix the features of high-rise and of separated housing as it represents both high densities of population and high costs of horizontal movement between the dwelling units.

The hypothesis to be tested is that high-rise living preferences are a direct function of age and of current social activity levels. The high-rise choice should also be a negative function of income. The opposite should hold for separated housing. Finally, the preferences for a motel modality should show no clear pattern with respect to the independent variables, since it contains interaction features that are contained in each of the other two modalities.

Technique of Analysis

A multivariate statistical technique is utilized in an attempt to identify the relationships discussed in the previous section of this paper. The technique was specifically selected to test whether any significant relationships exist between the independent (demographic) variables and the dependent (desired housing) variables. One of the more critical housing preferences concerned the type of building chosen (i.e., high-rise, motel or separated dwellings). This variable was chosen as dependent based on the activity analysis discussed above. It should be noted that type-of-housing is an attribute variable rather than a continuous variable and as such it leads to classification of the type of housing but not to a measurement of degree.

The most common approach to testing the relationship between a dependent variable and a set of independent variables would be multiple regression analysis. However, the multiple regression format requires that the dependent variable be continuous or dichotomous (as in the case of a dummy variable). The dependent variable which we are trying to explain, housing modalities, represents a classification based upon three groups. An appropriate statistical tool capable of handling this type of question is multiple discriminant analysis. Like regression analysis, which minimizes the sum of the squared deviations between the observed and the predicted observations, discriminant analysis utilizes a similar criterion. That is, the coefficients of the variables in the discriminant functions are estimated so that the discrimination between our three groups are maximized.

The Strengths of Duluth, Minnesota as a Case Study Area

The City of Duluth presents an interesting case study for the housing problems of the elderly. While the hinterland of the Duluth metropolitan area has experienced

numerous economic boom and bust periods, the city itself has essentially come through the last few decades with few apparent changes. The population of the city has fluctuated up or down by only a few percentage points each decade and the city's population rests quite squarely on 100,000.

This outwardly stagnant population condition, however, makes many internal changes in the population structure. Over the years the population profile has shifted with the outmigration of younger segments of the population resulting in Duluth having a relatively large number of elderly. In the 1970 census, Duluth recorded 13,430 at age 65 or older, which represents 13.4 percent of the population. This compares with a State of Minnesota percentage of 10.7 percent and a nationwide average of 9.9 percent. Moreover, the census listed 16,216 at 62 years or older (16.1 percent) which is indicative of the large numbers which have since moved into the 65 and over category.

The distribution and density of the population within the city is also an important feature in this study with a major integration/segregation component. Overall, Duluth has one of the lowest population density figures for cities which developed during the same time period. The population density of about 1,500 people per square mile, however, is mainly caused by the vast amount of undeveloped area or dedicated open space within the city limits. While this is an excellent feature for quality of life analysis, it means that the actual residential areas are quite densely populated with numerous old multi-unit structures on extremely narrow lots set in rather widely scattered subdivisions. Moreover, many of these residential clusters are too small to provide an adequate population threshold for most activities, and services needed by the elderly can be three, four, or more miles away.

As a result of these and other socio-economic factors, the elderly population of Duluth is quite unevenly scattered. Utilizing the 1970 Census of Housing figures, the percent of the population 62 years of age or older ranges from a low of 3 percent to a high of 47 percent in the various city census tracts. The tracts which contain over 20 percent elderly form an almost unbroken chain corresponding very closely to the extended northeast-southwest business-commercial corridor of Duluth. Based on this already high concentration of elderly in fairly compact areas it is possible that the elderly of Duluth have a higher interaction index than a more normally distributed population and thus would exhibit a greater demand for interaction outlets in the housing modalities which they would select.

This older population profile has also had the effect of dampening average household income and providing a lower per capita tax base for city projects. One result of this was that until the recent various federal housing programs, little work or planning had been done for senior citizen housing. Thus, when HUD moved into Duluth in the form of a Housing and Redevelopment Authority the pent-up demand for services was overwhelming.

Even after many government financed or financial backed housing projects have been completed the waiting lists for new housing continues to grow. With five major high-rise and numerous low-rise buildings completed and currently housing over 861 senior citizens, the waiting list still runs over 1,000.

Therefore, if an argument against using Duluth as a case study area exists it would be due to the above average characteristics which Duluth exhibits. The magnitude of the social and economic problem stemming from senior citizen housing needs in Duluth makes that distinction a rather academic one and realizing fairly similar problems facing many other cities the results should be quite transferable to other communities.

Statistical Profile of the Respondents

The demographic variables presented in Appendix I are listed in terms of both number and percentage of responses and are fairly self-explanatory. However, a brief description of some of the more significant characteristics will be summarized. The majority of the respondents (55 percent) are between 50 and 75 years of age. They are primarily widowed (71 percent), females (79 percent). Most have lived in Duluth a significant period of time (94 percent have lived in Duluth for more than 10 years), and their principle source of income is from social security funds (69 percent).

More importantly, most of the individuals (75 percent) earned less than \$3,000 in income annually. Similarly, the educational levels attained were low (59 percent had eight years or less of formal education), and many learned their occupation by on the job training (22 percent). The respondents felt that they had fair to good health (91 percent). Since their health is viewed as good, their medical bills are not excessive (70 percent paid less than \$25 per month for recurring medical expenses).

Some evidence can be brought to bear on the notion that the elderly are dissatisfied with the present housing. First, the leasing of separated housing units is the most common housing arrangement (69 percent) and according to the Heslin study cited earlier, this form of leasing provides the least population density and the least interaction between the elderly and other members of society. It is also the arrangement that most of the persons in the Heslin study would like to terminate.

Second, the majority (65 percent) felt themselves to be active in physical terms. Yet their activities are carried on alone (53 percent). Furthermore the "frequency of" those activities involving social interaction appear quite low except for "talking to a relative or friend daily," (80 percent). These facts point to the possibility that activities engaged in alone may not be by choice, but rather by circumstances forced upon elderly residents by current living arrangements.

Looking at the remaining factors, it can be noted that most of the activity reported involved either talking with a friend or relative or participation in church events. Public meeting attendance and social games had a very low frequency as had other activities apart from the five listed above.

Even though the individuals were randomly chosen for the survey, a very uneven distribution of present housing location was evident. Out of 18 subareas of Duluth that were listed, Central Hillside (25 percent), West End (19 percent), West Duluth (15 percent) and East End (13 percent) were the most commonly

mentioned as preferred areas of future residence.

Finally, under the survey question dealing with "reasons for moving," the largest percentage of those that responded said the financial reasons prompted the move. It should be noted that this percentage is under 50 percent. This is contrary to some of the observed relationships that were noted in the Rosow [8] analysis. Student-interviewer remarks at the end of the questionnaire found their current living conditions to be subjectively good. However, this discrepancy can be explained by noting that the lawns were generally in need of care and that many were living in large homes which would be difficult to maintain. These respondents often listed "poor living conditions" as a motivation for wanting to move.

Selected Preference Responses

When the survey that is being summarized in this paper was contemplated by the City of Duluth, it was felt that by making minor adjustment in public housing characteristics, great increases in elderly housing satisfaction could be gained at little cost. The survey was designed to measure the needs and preferences of the consuming population. The responses appeared quite unanimous concerning essential housing needs and this fact lends veracity and usefulness to the survey even when reported in a raw data format. It would seem useful, therefore, to summarize these preferences for whatever application they may hold for other regions facing similar housing decisions prior to analyzing the data in more sophisticated terms. This is accomplished in Appendix II.

The data contained in Appendix II reflects the desires of the respondents in three categories: firstly, the preferred type of building structure; secondly, the most desired internal features of the living area; and thirdly, the primary characteristics of building location preferences.

The reader may make whatever inferences that may seem to be appropriate from the information contained in the Appendix. The purpose here will be to highlight a few of the more significant implications with respect to the literature review in this paper.

First, there appears to be an attractive force generated by present elderly population location patterns. This was indicated in the review of the census data for the Duluth area. This may be coupled with the generally negative response with respect to the desire to live in locations having children, relatives, or other populations of a younger age to support the notion that the elderly do geographically segregate themselves from other portions of the society. Further, there seems to be at least some limited evidence from the data that the elderly endorse this geographic segregation within their own preference pattern expressions.

There is a second question that is in need of investigation in this regard. Once the elderly are geographically segregated from other members of the community, what are their preferences for interaction with other members of their age cohort group? In other words, do they wish to have frequent social interaction with others in their age bracket, or is the segregation mentioned earlier complete, with little desire to interact with anyone.

The evidence seems to give at least limited credibility to the notion that there is still a strong desire on the part of the respondents to engage in meaningful interaction. In the first place, the data in Appendix II demonstrates that the elderly in this sample frequently interact with others (friends or relatives) under their current living arrangements. Secondly, the respondents overwhelmingly opted for a high-rise building structure over the single family or the motel response. The high-rise option allows for a maximum of interaction through the process of reducing the difficulty of movement between living units. This will be discussed further in the section to follow.

If any pattern does emerge from these data, it seems to be that the population served do prefer to have the option of interaction with others in their own age grouping, but that they want to have this interaction on their own terms. That, in fact, they want to have the ease of access without the constraints that would be imposed by distances between residential units, but that they also want the interaction to be one-to-one, perhaps in the privacy of their own living room. This puts the problem into the more traditional one of reducing the transportation costs of a desired activity, in this case, of social interaction.

Empirical Relationship Between Modality Choices and Demographic Variables

The following section tests the hypothesis implicit in activity theory (Section 3) using the tool of multiple discriminant analysis (Section 4). The three modality choices available in Duluth for subsidized housing are: high-rise, exhibiting the highest density of elderly; separated dwellings, exhibiting the lowest density; and multiple-unit motel dwelling, exhibiting some of the characteristics of both modalities. For the purposes of this paper, the vertical housing modality, high-rise, was compared to horizontal living arrangements, motel and single family dwellings. The assertion already stated is that preferences for high-rise living are directly related to age and social interaction and negatively related to income.

The results of the discriminant analysis were encouraging. A stepwise program [9] was used with eight possible independent variables, including: the continuous variables of age, monthly income, years in Duluth, monthly average medical expenses, and years of education; the dummy variables of marital status and social activity; and an index variable representing levels of interaction. The technique chose the most important variables. Variable selection was based on the partial F statistics at each sequential step of the program. F levels for inclusion and deletion were set at 1.00. This low level was chosen because of the large number of observations (83 in total) and the probable statistical significance which would be satisfied should only several variables enter. The order of entry and partial F's of the discriminant function are depicted in Table I.

It should be noted that the partial F value for income is small compared to age and social interaction. It is unexpectedly high, however, in that the elderly in the survey have all qualified for publicly subsidized housing and therefore have low incomes. It would be expected, and should be further tested, that the high-rise preference is less important for other populations of elderly with higher incomes.

Although a statistical technique has been used to analyze the relationships hypothesized these statistics will be relied on for their descriptive value. Several data limitation exist which diminish the inferential strength of this analysis. A random sample of 178 individuals were chosen for the initial survey from a population made up of individuals on a waiting list for subsidized housing. The 84 observations chosen out of the 178 were selected because of the completeness of their responses to the question of housing choices and eight independent variables. Non-responses to any of the questions led to the survey's rejection. This extravagant treatment of non-responses seemed justified because of the relative wealth of available data.

Discriminant analysis is used to classify an individual based on his or her response to the independent variables. In this example, on the basis of the discriminant functions, an observation is classed into a housing modality on the basis of age, social interaction, and income. The predictive value of the technique is determined by the discriminant function's ability to classify. If no relationship existed between the independent variables and the three housing modalities, then each observation would have a one-half probability of being classed into a particular housing modality.

Table 2, which represents the actual classification as compared to the classification probabilities, shows that in the high rise group, 79 percent of the 34 observations were properly classified in the combined motel and single family group, 72 percent of the 47 observations were properly classified. In both of these cases, the proportion of correct classifications was well above 50 percent.

The ability of the discriminant function to classify can be demonstrated by examining observations on a set of specially scaled axes (see Diagram III). The clusters of single family and motel dwellings appear quite consistent, with the vertical arrangement occupying the right side of the diagram and the horizontal arrangement occupying the left side.

These results appear to be consistent with activity theory. Horizontal living arrangements necessarily have higher accessibility costs than does a vertical, high rise arrangement. Therefore, it is reasonable to expect that the desire for interaction should discriminate between horizontal and vertical living arrangements.

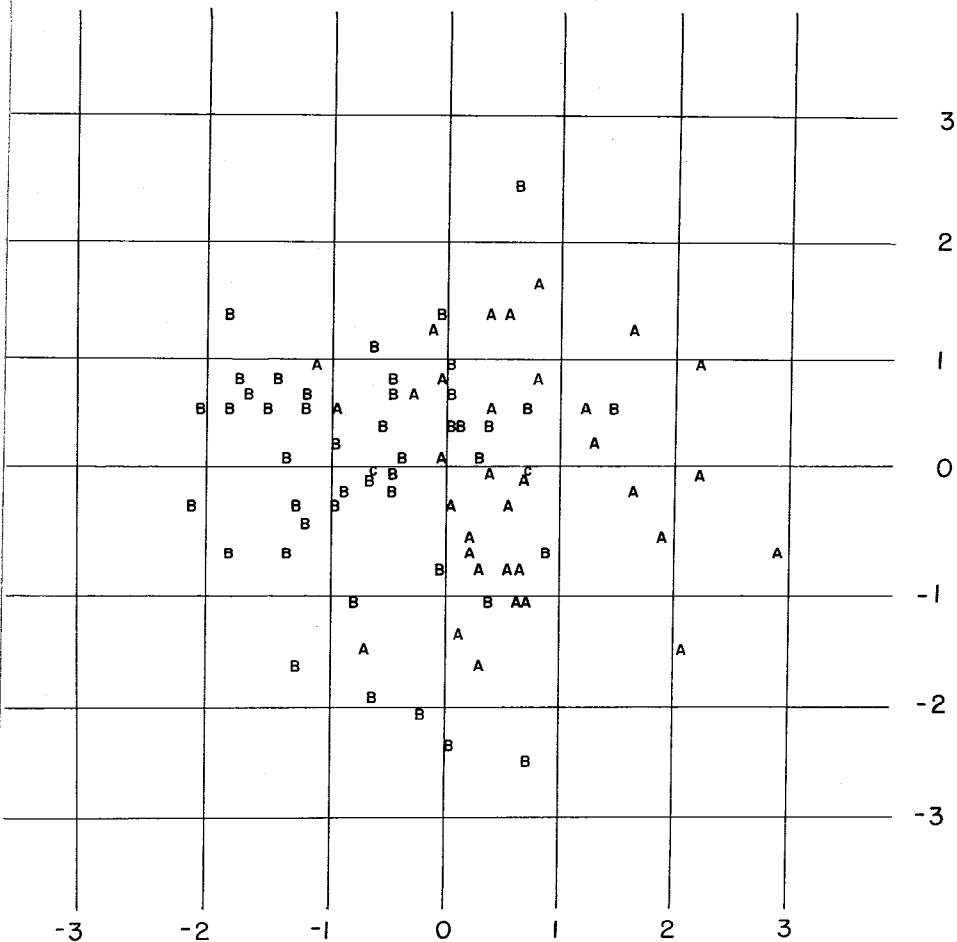
Summary and Conclusions

Activity theory states that the individual is forced by circumstances to reduce his or her amount of social interaction as the aging process continues through middle age towards old age. This is due to both the increased price of social interaction and to the loss of income that often accompanies old age. Multiple discriminant analysis was used to test this hypothesis for a low income population of elderly individuals that had applied for public assisted housing in Duluth, Minnesota.

The results of the experiment were quite promising, indicating that act-

TABLE 2: Number of Cases Classified into Group

Group	H	M & S	Total
H	27 (79%)	7 (21%)	34 (100%)
M & S	13 (27%)	34 (72%)	47 (99%)



POINTS OFF GRAPH

A (4.0, 1.4)

B (-3, -3.1)

DIAGRAM III

ivity analysis does, in fact, predict well in this study. This leads to a variety of implications of social policy designed to house the elderly. For example it may be possible to meet the needs of a low income population similar to the one investigated with relatively small changes in the physical arrangements of government assisted housing. In general, it appears that high rise dwellings are more important to older individuals that display significant amounts of social interaction and that exhibit lower income levels. Motel and scattered housing modalities seem to be more important to the younger, less active and higher income individuals.

Further tests of this type using middle and high income populations would seem to be useful for a more complete understanding of the aging process. Tests of the alternative "disengagement theory" of aging would be particularly useful along these lines.

APPENDIX I

Profile of the Respondents: Demographic Variables

Summary of Frequency and Percentages

(178 Respondents)

<u>Age (years)</u>	<u>Number</u>	<u>Percent</u>	<u>Source of Income</u>	<u>Number</u>	<u>Percent</u>
50 to 70	54	30	Social Security	123	69
71 to 74	44	25	Pension	15	8
75 to 80	39	22	Home	5	3
81 to 84	28	16	Employed	6	3
85 and up	12	7	Other	4	2
<u>Sex</u>			<u>Education</u>		
Male	38	21	0 to 8 years	105	59
Female	140	79	9 to 12 years	30	17
			12 years and over	40	22
<u>Marital Status</u>			<u>Training</u>		
Married	24	13	On the Job	40	22
Widowed	126	71	School	12	7
Divorced	9	5	Other	18	11
Separated	19	11			
Single	0	0			
<u>Years in Duluth</u>			<u>Health</u>		
0 to 5	3	2	Good	101	57
6 to 10	4	2	Fair	61	34
11 and up	168	94	Poor	12	7
			Invalid	4	2
<u>Income/Year</u>			<u>Active</u>		
0 - 999	8	4	Yes	116	65
1000 -1999	61	34	No	62	35
2000 -2999	65	37			
3000 -3999	13	7	<u>Average Medical Bills (Monthly)</u>		
4000 -4999	8	4	\$ 0 to \$25	125	70
5000 -over	2	1	26 to \$50	10	6
			Over \$50	12	6

*Percentage figures in each category did not necessarily add up to 100 percent because the percentages were taken from the total population and not just from those answering the specific question. The number that is needed to make these percentages add up to 100 may be categorized as "no response." This makes the percentages comparable from one questionnaire category to the next.

APPENDIX I (Continued)

<u>Activities</u>	<u>Number</u>	<u>Percent</u>	<u>Current Residence</u>	<u>Number</u>	<u>Percent</u>
Alone	95	53	Own Home	37	21
Formal Group	56	31	Renting	123	69
Informal	27	15	With Relative or Friend	11	7
			Other	6	3
<u>Frequency of:</u>			<u>Reasons for Moving</u>		
Talk to Relative or Friend			Other		
Daily	142	80	Applies	103	58
Weekly	28	16	Does not Apply	74	42
Monthly	3	2	Financial Reasons		
Other	4	2	Applies	59	33
Visit a Relative or Friend			Does not Apply	119	67
Daily	44	25	Poor Living Conditions		
Weekly	104	58	Applies	45	26
Monthly	22	12	Does not Apply	133	75
Other	8	4	Transportation Needs		
Frequency of:			Applies	24	13
Social Game with Friends			Does not Apply	154	87
Daily	6	3	Availability of Service		
Weekly	39	21	Applies	13	8
Monthly	29	16	Does not Apply	165	93
Other	102	57	Security/Safety Reasons		
Attend Church			Applies	13	7
Daily	3	2	Does not Apply	165	93
Weekly	98	55			
Monthly	16	9			
Other	61	34			
Attend Public Meetings					
Daily	2	1			
Weekly	3	2			
Monthly	13	7			
Other	157	88			
Other Activities					
Daily	2	1			
Weekly	6	3			
Monthly	3	2			
Other	58	33			

APPENDIX I (Continued)

<u>Current Living Area</u>	<u>Number</u>	<u>Percent</u>
Central Hillside	45	25
West End	33	19
West Duluth	27	15
East End	24	13
Denfeld	8	5
Duluth Heights	9	5
Park Point	8	4
Riverside	5	3
Lester Park	4	2
Piedmont	3	2
Bayview Heights	1	1
Fond du Lac	1	1
Gary, New Duluth	1	1
Hunters Park	1	1
Kenwood/Skywood	1	1
Morgan Park	2	1
Proctor	2	1
Woodland	1	1
No response	0	0

APPENDIX II

Summary of Frequency and Percent Figures for Dependent Variables for Housing Study

(178 Respondents)

Category I

<u>Choice of Building:</u>	<u>Number</u>	<u>Percent</u>
High-Rise	100	56
Motel	48	27
Single Dwelling	24	13
No Response	6	3

Category II

Laundry

Important	154	87
Not Important	24	13

Individual Temperature Control

Important	153	86
Not Important	25	14

Safety Features

Important	148	83
Not Important	30	17

View

Important	144	81
Not Important	34	19

Storage

Important	139	78
Not Important	39	22

Most Important Room

Living Room	132	74
Kitchen	26	15
Other	7	4
Bedroom	6	3

Category II (Continued)

<u>Bathtubs</u>	<u>Number</u>	<u>Percent</u>
Important	125	70
Not Important	53	30
<u>Showers</u>		
Important	97	54
Not Important	81	46
<u>Security</u>		
Important	106	60
Not Important	72	40
<u>Indoor Recreation</u>		
Important	120	67
Not Important	58	33
<u>Outdoor Walks</u>		
Important	117	66
Not Important	61	34
<u>Common Dining Area</u>		
Important	92	52
Not Important	86	48
<u>Meeting Rooms</u>		
Important	70	39
Not Important	108	61
<u>Multiple Windows</u>		
Important	91	51
Not Important	86	48
No Response	1	1
<u>Cupboard Heights</u>		
Important	74	42
Not Important	104	58
<u>Furnished</u>		
Important	51	29
Not Important	127	71

Category II (Continued)

<u>Choice of Colors</u>	<u>Number</u>	<u>Percent</u>
Important	47	26
Not Important	131	74
<u>Vending Machines</u>		
Important	34	19
Not Important	144	81
<u>Saunas</u>		
Important	23	13
Not Important	155	87

Category III

<u>First Choice of Living Area</u>	<u>Number</u>	<u>Percent</u>	<u>Being Near</u>	<u>Number</u>	<u>Percent</u>
Central Hillside	56	31	<u>Shopping Facilities</u>		
West Duluth	30	17	Important	127	88
East End	25	14	Not Important	21	12
West End	24	13	<u>Bus Routes</u>		
Park Point	13	7	Important	146	82
Duluth Heights	6	3	Not Important	32	18
Lakeside-Lester Park	5	3	<u>Churches</u>		
Kenwood	4	2	Important	122	69
Denfeld	3	2	Not Important	56	31
Proctor	3	2	<u>Present Location</u>		
Woodland	2	1	Important	97	54
Bayview Heights Oneota	1	1	Not Important	81	46
Hunters Park-Chester Park	1	1	<u>Medical Facilities</u>		
Piedmont Heights	1	1	Important	86	48
Morgan Park	1	1	Not Important	92	52
No Response	3	2	<u>Relatives</u>		
<u>Second Choice of Living Area</u>			Important	75	42
West End	21	12	Not Important	103	58
West Duluth	18	10	<u>Parks</u>		
Central Hillside	18	10	Important	51	29
East End	17	10	Not Important	127	71
Park Point	9	5	<u>Services</u>		
Woodland	8	4	Important	43	24
Duluth Heights	6	7	Not Important	135	76
Piedmont Heights	3	2			
Proctor	3	2			
Lakeside-Lester Park	2	1			
Kenwood	4	2			
Denfeld	2	1			
Gary, New Duluth	1	1			
No Response	66	37			

Category III (Continued)

<u>Third Choice of Living Area</u>	<u>Number</u>	<u>Percent</u>	<u>Being Near</u>	<u>Number</u>	<u>Percent</u>
East End	5	3	<u>Recreation</u>		
West Duluth	4	2	Important	32	18
Central Hillside	4	2	Not Important	146	82
Lakeside-Lester Park	4	2			
Duluth Heights	3	2	<u>Near Children</u>		
Park Point	3	2	Important	30	17
West End	3	2	Not Important	148	83
Kenwood	1	1			
Hunters Park-Chester Park	1	1	<u>Civic Centers</u>		
Fond du Lac	1	1	Important	19	11
Woodland	1	1	Not Important	159	89
No Response	148	83			

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