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TRANSPORTATION-RELATED CONSTRUCTS OF ACTIVITY SPACES OF SMALL TOWN RESIDENTS

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RESEARCH REPORT 18

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DEPARTMENT OF TRANSPORTATION
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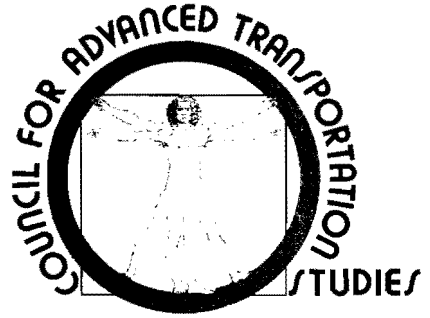

THE UNIVERSITY OF TEXAS AT AUSTIN

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16. Abstract

This paper first discusses the nature of the space which people in small urban areas use for recurrent activities. It is postulated that most work on the individual's activity space is founded on a classical geometric conception of place. An alternative cognitive definition is proposed. Places which are used for such purposes as shopping or recreation are described by learned bundles of meanings (constructs) given a transportation system permitting movement within space. Recent modifications of Kelly's Personal Construct Theory and elicitation procedures are used to demonstrate the richness of the cognitive definition of place, with data from a small sample of 31 University students. In conclusion, it is suggested how elicited transportation-related constructs of places can be utilized to develop improved models of behavior within urban activity spaces.

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EXECUTIVE SUMMARY

INTRODUCTION

This report is concerned with one phase of a research project entitled, "The Influence on The Rural Environment of Interurban Transportation Systems." It represents an initial step in the attempt to develop a model for predicting how different groups in small urban areas will respond to proposed or actual changes in the interurban transportation system. At the same time, the research is part of a larger effort aimed toward developing improved models of behavior within urban activity spaces in general.

PROBLEM STUDIED

The nature of the activity spaces which people use for recurrent activities (shopping, work, recreation, etc.) has received considerable attention in recent studies. However, most work on an individual's activity spaces is founded on a classical geometric definition of place. In this report, an alternative concept of space is proposed based on a cognitive definition of place. Given a transportation system permitting movement within space, places which are used for recurrent activities are described by learned bundles of meaning (constructs).

Of special interest in this case are the cognitive definitions of place used by smalltown residents. While some work has been conducted with residents of larger urban areas, it is hypothesized that those from smaller communities will use different constructs in place definition.

RESULTS ACHIEVED

Using G. A. Kelly's personal construct theory[1] and elicitation procedures modified by P. Slater,[2] an experiment was designed to determine significant constructs used by small town residents to define their recurrent activity spaces. A sample of 31 Univeristy of Texas freshmen from towns ranging in

population from under two thousand to twenty thousand was randomly chosen to participate in the experiment. There were two reasons for the choice of participants other than the size of their hometowns. First, the elicitation procedures used in the experiment are time-consuming, and thus a relatively small sample was selected. Second, since it has been found that construct elicitation requires an articulate group of respondents, university students were deemed an appropriate group from which to select subjects, although it was necessary that they were not long removed from a small town environment.

The actual procedure of obtaining the constructs was divided into five steps. First, each student was asked to list places within his/her hometown which he/she regularly visited. Each was asked to begin with "home" as the first place and then list the others in order of recall. In the second step, each participant listed twenty four places outside his/her hometown.

In the third step, each subject was presented with combinations of three places from each list. These combinations, or triads, were determined by randomizing procedures so that, for example, places numbered 1, 5, 16 might be presented as one combination to all students, even though these would represent different places for each person. The subject was then asked to put two members of the triad together on the basis of some characteristic which made them alike and opposite from the third.

The fourth step required the participant to label the two characteristics which he/she used to identify the two groups of the triad. Thus, for each triad two constructs were elicited. The subject was then asked to state which construct he/she preferred, and the total of these were set aside as "preferred constructs" for the next step in the experiment.

The final phase involved the use of a repertory grid. The preferred constructs were arranged in order of most to least preferred. These were then listed in the vertical margin of the grid. The numbers of each place listed by the student constituted the horizontal margin of the grid. Each subject was then asked to rate on a scale of 1 - 7 the <u>amount</u> of the quality that each place possessed.

The in-town and out-of-town repertory grids for a person summarize the individual's cognitive definitions of every component in his/her activity space. Consequently, the repertory grids of the 31 respondents, taken all together, summarize considerable information about transportation-related meanings of places in the activity spaces of smalltown residents in general.

A comparison of the preferred poles of the 31 subjects indicates marked differences in the names, number, and preferential order of the constructs on both in-town and out-of-town grids. Likewise, for each individual the names, number, and preferential order tend to differ depending on whether he/she is considering places within the hometown or outside of it.

As can be expected, the magnitude of variation in the total sample produces an unwieldly number of individually-defined constructs. However, taken together, a considerable quantity of information is provided concerning the preferred, transportation-related features of activity spaces.

In order to extract communality from the lists of many preferred poles, a modified principal components analysis (INGRID) is used to identify and give order to the attributes which give meaning to places for smalltown residents.

Through the principal components procedure, the multitude of verbal constructs elicited from the subjects is reduced to a manageable number of components (attributes). These attributes are named, following standard practice, by looking at the construct loadings on components.

As with the constructs, differences exist between individuals in their components for within-town grids, out-of-town grids, and the grids for each individual depending on whether he/she was considering within-town places or out-of-town places. Over the entire sample of subjects, however, many components were found to be common to several individuals, but at vary-

ing levels of salience. It seems clear that some communality and order in transportation-related definitions of activity spaces is revealed in these data through the use of INGRID.

Thus, the present procedures for searching for cognitive meanings of places will produce a considerable quantity of information which can be given a parsimonious form. However, there will be some arbitrariness in the final selection of components (attributes) to be used in further field research or for incorporation in models.

Nonetheless, some such degree of arbitrariness is required in these circumstances in any case. Moreover, a pilot study like the present one has the advantage that the subject's, rather than the researcher's, meanings of place can be used in later research.

In spite of the difficulties of the procedure so far recognized, its benefits seem clear. From a very large number of differentially-ordered and defined transportation-related constructs of urban activity spaces, a reduced number of operationally feasible attributes may be derived. These attributes, elicited from a small pre-sample, help define places within urban activity spaces in terms of their preferred meanings to individuals.

UTILIZATION OF RESULTS

The results of this research should be of value to federal, state, and local planning agencies and to research groups interested in the perceived impact of transportation investments as well as to those interested in the general problem of defining activity spaces. This experiment represents a first step toward identifying the attributes of places which smalltown residents perceive as being important.

CONCLUSION

It remains to illustrate in conclusion how the results of a small-sample study like the present one can be utilized to explain at least one kind of spatial behavior--in this case, the evaluation of the impacts on

activity spaces of different transportation systems. At least one computerized model is available, INDSCAL, which will measure environmental utility for both individuals and groups under alternative transportation services.[3]

One essential requirement of this model is a list of semantic differential scales, with poles opposite in meaning, to define the important attributes of activity spaces under a transportation system. These scales are then used by an individual to score his/her activity space across as wide a range as possible of attributes which people regard as significant. The scores for an individual's activity space under different transportation alternatives are later manipulated to generate the required measures of environmental utility. The necessary semantic scales can obviously be generated by a judicious selection of the components describing activity spaces elicited from a small scale sample like the one above.

The second essential requirement of the INDSCAL model is that both the attributes and the saliences of the attributes of activity spaces must vary between individuals. The findings of inter-individual heterogeneity in the study above are consistent with this. Accordingly, the cognitive definition of place, and the procedures used to define it, seem applicable in at least one modelling area: the use of INDSCAL to define the impacts of transportation changes on the environments of population groups.

On the basis of the experiment with the students from small towns, a list of attributes was derived and incorporated into a survey for field testing in one community (Sealy, Texas). These attributes provide the necessary basis for semantic differential scaling, permitting an individual to rate the perceived effect on the smalltown environment of different transportation systems, both actual and potential.

The survey was administered to a sample of 104 residents of Sealy; the analysis of the respondents' scaling of possible effects that different transportation alternatives have had or might have on the community is presently underway. The results will be utilized to generate a model to predict how different groups will respond to changes in transportation systems.

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1. Kelly, G. A., The Psychology of Personal Constructs (New York: W. W. Norton, 1955).
2. Slater, P., "Theory and Techniques of the Repertory Grid," British Journal of Psychiatry, Vol. 115 (1969), pp. 1287-1296.
3. Shepard, R. N., A. K. Romney, and S. B. Nerlove (Eds.), Multidimensional Scaling: Volume 1: Theory (New York: Seminar Press, 1972).

PREFACE

This is the eighteenth in a series of research reports describing activities and findings as part of the work conducted under the research project entitled "Transportation to Fulfill Human Needs in the Rural/Urban Environment." The project is divided into five topics; this report describes a portion of the research under Topic II, "The Influence on the Rural Environment of Interurban Transportation Systems."

This report is concerned with one phase of the research which deals with the small town resident's perception of transportation-related aspects of his/her environment. It represents an initial step in an attempt to develop a model to predict how different groups in small towns will respond to proposed or actual changes in the interurban transportation system.

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Jose Montemayor

December 1974

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John Huddleston and Gordon Derr, of the Division of Research in Transportation, also helped with organizing the study interviews, and their assistance was greatly appreciated.

ABSTRACT

This paper first discusses the nature of the space which people in small urban areas use for recurrent activities. It is postulated that most work on the individual's activity space is founded on a classical geometric conception of place. An alternative cognitive definition is proposed. Places which are used for such purposes as shopping or recreation are described by learned bundles of meanings (constructs), given a transportation system permitting movement within space. Recent modifications of Kelly's Personal Construct Theory and elicitation procedures are used to demonstrate the richness of the cognitive definition of place, with data from a small sample of 31 University students. In conclusion, it is suggested how elicited transportation-related constructs of places can be utilized to develop improved models of behavior within urban activity spaces.

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TRANSPORTATION-RELATED CONSTRUCTS OF ACTIVITY SPACES OF SMALL TOWN RESIDENTS

INTRODUCTION

Since the seminal work of Horton and Reynolds[1] on action spaces and by Brown and Moore[2] on activity spaces, considerable interest has been shown in the delimitation, description and use of those places which the urban individual visits in the course of recurrent activities (shopping, recreation, working, visiting friends, etc.). This interest is now particularly reflected in space-time budget studies and activity analyses, following Hagerstrand and Chapin.[3] It is also manifest in studies of the cognition and learning of the locations used in the course of recurrent travel.[4] In much of this work, a classical geometric definition appears to be given to the destinations and routes comprising the time-space within which a decisionmaker journeys: destinations are objects that are

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[1]F. E. Horton and D. R. Reynolds, "An Investigation of Individual Action Spaces: A Progress Report," Proceedings of the Association of American Geographers, Vol. 1 (1969), pp. 70-74.

[2]L. Brown and E. G. Moore, "The Intra-Urban Migration Process: A Perspective," Geografiska Annaler, Vol. 52, Series B (1970), pp. 1-13.

[3]Reviewed by J. Koefed, "Person Movement Research: A Discussion of Concepts," Regional Science Association, Papers, Vol. 15 (1970), pp. 141-155; J. Anderson, "Space-Time Budgets and Activity Studies in Urban Geography and Planning," Environment and Planning, Vol. 3 (1971), pp. 353-368; and G. A. Gutenschwager, "The Time-Budget Activity Systems Perspective in Urban Research and Planning," Journal of the American Institute of Planners, Vol. 39 (1973), pp. 378-387.

[4]For example, see R. Downs, "The Cognitive Structure of an Urban Shopping Center," Environment and Behavior, Vol. 2 (1970), pp. 13-39; and S. E. Hanson, Information Levels and the Intra-Urban Travel Patterns of Swedish Households, (Household Travel Behavior Study, Report No. 5, Transportation Center, Northwestern University, 1973).

most readily conceptualized as points or areas, and linkages between them are most readily conceived of as lines.[5]

This report outlines a preliminary attempt to provide and test for an alternative cognitive definition of place, which yields much more information about properties defining places which are significant to individuals. It also briefly outlines how a cognitive definition of place might be used for the explanation of some other behaviors besides recurrent travel in small town activity spaces.

ARGUMENT

Recent work on the impact of changes in transportation networks suggests that places are defined by individuals, not geometrically, but in terms of subjective meanings ascribed to them. Alterations in a network cause disruptions in that bundle of learned meanings which define places as components of activity spaces. In turn, these alternatives cause changes in place preference and utility which may ultimately be manifested not only in shifts in travel behavior, but also in residential migration, or in political activities directed towards the conservation or alteration of the cognitive definitions of places.[6]

Justification for this definition of place as an alterable bundle of learned meanings, some of which are transportation-related, is provided by three sources:

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[5]See S. E. Hanson, Information Levels . . ., op. cit., pp. 7-9, especially 9, and R. Palm and A. Pred, "A Time-Geographic Perspective on Problems of Inequality for Women," ed. K. P. Burnett, New Perspectives on the Roles of Women in Society (Chicago: Maaroufa Press, forthcoming).

[6]For example, see University of Pennsylvania, Department of Regional Science, Research in Conflict on Location Decisions (Discussion Series, Nos. 1-19, September, 1970 to May, 1972.

(1) the use of theory and tests in clinical psychiatry concerning the individual's definition of objects (e.g., places) by meanings ascribed to them (personal constructs);[7]

(2) the adjectives used by protagonists to describe the desirable/undesirable connotations of places within activity spaces prior to or after transportation changes;[8]

(3) the few recent applications of extensions of Kelly's work to define "what is place?" in the study of urban images;[9] in environmental perception and evaluation;[10] and in housing and neighborhood description.[11]

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[7]Following G. A. Kelly, The Psychology of Personal Constructs (New York: W. W. Norton, 1955).

[8]For example, see those listed in J. Hinman, Controversial Facility-Complex Programs: Coalitions, Side-Payments and Social Decisions (Research on Conflict in Locational Decisions, Discussion Paper 8, Regional Science Department, University of Pennsylvania, 1970), and S. Amir, "Highway Location and Public Opposition," Environment and Behavior, Vol. 4 (1972), pp. 413-436.

[9]For example, see D. Demko, "The Structure of Common Urban Constructs," International Geography, Vol. 2 (1972), pp. 854-856; and J. D. Harrison and W. A. Howard, "The Role of Meaning in the Urban Image," Environment and Behavior, Vol. 4 (1972), pp. 387-411.

[10]For example, see B. Honikman, "An Investigation of the Relationship Between Construing of the Environment and Its Physical Form," Proceedings EDRA 3, Vol. 1 (1972), pp. 6.5.1.-6.5.11; V. J. Silzer, Personal Construct Elicitation in Space Preference Research (Discussion Paper Series, No.1, Department of Geography, York University. Toronto, 1972); R. Hudson, "Measurement of Environmental Images and Their Relationship to Behavior: An Example of the Use of the Repertory Grid Methodology," a paper read to a meeting of the Quantitative Methods Group, Institute of British Geographers, Coventry, 1972; H. S. Leff and P. S. Deutsch, "Construing the Physical Environment: Differences Between Environmental Professionals and Lay Persons," Proceedings of EDRA 4, Vol. 1 (1973), pp. 284-297; and B. Goodchild, "Class Differences in Environmental Perception: An Explanatory Study," Urban Studies, Vol. 2 (1974), pp. 157-169.

[11]For example, see E. J. Harman and J. F. Betak, "Some Preliminary Findings on the Cognitive Meaning of External Privacy in Housing," Proceedings of EDRA 5, (forthcoming), and C. J. Tuite, Personal Construct Theory and Neighborhood Cognition (M.A. thesis, Department of Geography, McMaster University, Hamilton, Ontario, 1974).

Bannister, Mair, Hinkle, Bonnarius, Slater, and Epting, et al., are among those who have modified or extended Kelly's work in psychology on Personal Construct Theory.[12] For the purposes of this report, however, it does not seem necessary to elaborate on these theoretical and methodological alterations. It seems appropriate only, first, to critically examine how Personal Construct Theory and elicitation procedures can be applied to define transportation-related meanings of places in urban activity spaces; second, to illustrate and evaluate the results for selected members of a sample of individuals; and third, to point out how such results can be input into a general model of the evaluation of environmental aspects of activity spaces under alternative transportation conditions.

GENERAL METHODOLOGY

Conceptually, following Kelly and the application of his theory and method to environmental studies by Harrison and Sarre,[13] each person should be viewed as having an individual activity space containing a unique set of

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[12] D. Bannister, "Personal Construct Theory: A Summary and Experimental Paradigm," ACTA Psychologica, Vol. 20 (1962), pp. 104-120; D. Bannister and J. M. M. Mair, The Evaluation of Personal Constructs (London: Academic Press, 1963); D. N. Hinkle, The Change of Personal Constructs from the Viewpoint of a Theory of Construct Implications (Ph.D. dissertation, Columbus, Ohio, The Ohio State University, Department of Psychology, 1965); J. C. J. Bonnarius, "Research in the Personal Construct Theory of George A. Kelly: Role Construct Repertory Test and Basic Theory," ed. B. A. Mahr, Progress in Experimental Personality Research (New York: Academic Press, 1965); P. Slater, The Principal Components of a Repertory Grid (London: Vincent Andrews, 1964); P. Slater, "Theory and Techniques of the Repertory Grid," British Jounal of Psychiatry, Vol. 115 (1969), pp. 1287-1296; P. Slater, Notes on INGRID 72 (London: Institute of Psychiatry, 1972); and F. R. Epting, D. I. Suchman, and C. J. Nickerson, "An Evaluation of Elicitation Procedures for Personal Constructs," British Journal of Psychology, Vol. 62 (1971), pp. 513-517.

[13] J. Harrison and P. Sarre, "Personal Construct Theory in the Measurement of Environmental Images: Problems and Methods," Environment and Behavior, Vol. 3 (1971), pp. 351-374.

n elements, where each element, i, is defined by some number of constructs, m_i (i = 1, . . ., n). The n elements will be places visited on recurrent activities by the individual, and the m_i constructs will be the meanings which he/she uses to define the places. (It will be noted that, in this case, the specification of each person's element and construct sets will be dependent upon the existence of transportation services: without these, no elements can be defined because no recurrent activities can be conducted.) Constructs are considered as subjectively perceived characteristics (e.g., perceived distance to a place); however, they are also conceived as bipolar scales, where the poles provide oppposite descriptions of the characteristic for the individual (e.g., "near," "far"). Clearly, every person's activity space under this theory can contain different elements (places), and each element can be measured (defined) in different ways using different constructs by different persons.

Although construct and element systems are personal, it seems plausible to argue that similarities will exist in the systems of different individuals from similar backgrounds and with similar experiences. However, for a large sample of heterogeneous individuals, it is conceptually possible to obtain an extremely large number of elements and constructs. Hence, construct theory and elicitation procedures should ideally be used, as they are here, for pilot studies with small homogeneous samples, prior to model-building or large scale sample survey questionnaire designs.

Practical reasons also appear to favor the application of Personal Construct Theory and elicitation procedures for small-sample, pilot research. Previous work [14] indicates that the elicitation of meanings (constructs) of places requires a relatively articulate group of respondents; constructs can therefore be readily elicited only from a well-educated sample and not from the whole population. Furthermore, the procedure is one which is time-consuming, so only a small sample of respondents will be willing to assist.

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[14] See. C. J. Tuite, Personal Construct Theory . . ., op. cit., and E. J. Harman and J. F. Betak, "Some Preliminary Findings . . .," op. cit.

At the same time, most of the work to date has concentrated on individuals whose activity spaces are within large urban areas. There exists a clear need for studying the activity spaces of small town residents and the meanings they assign to these spaces. Hence, this study was limited to a sample of 31 cooperative first year university students from towns within the range of 2,000 to 20,000. The emphasis on activity spaces of residents of smaller, rather than larger, urban areas is meant to lay a foundation for discriminating between the possible differences in the perceptions of the small town resident and those of his/her metropolitan counterpart.

At the same time, in keeping with the avowedly experimental purposes of this paper, the use of a sample from small towns allows control over the possible number of elements and constructs elicited. It is clearly a plausible assumption that respondents from larger urban areas will provide more elements and more diverse definitions of places within their activity spaces.

EXPERIMENTAL DESIGN

The experiment was divided into two parts. (See Figure 1, p. 7 for an outline of the experimental procedure and examples of the subjects' responses.) First, each student listed against numbers from 1 to 24 all those places inside his or her home town (including routes, sidewalks, and streetcorners) which were used for recurrent activities. "Home" was always recorded against the number 1, but remaining places were listed against successive numbers in order of recall. Second, the students listed against number 1 to 24 all those places outside their home towns which were used for recurrent activities, including non-rural places. The majority of small-town respondents, as might be expected, had difficulty in listing 24 elements; the number of places available to them to use on recurrent activities is small.

The application of this procedure meant that, over the whole smaple of students, different numbers stood for different elements in activity spaces encompassing both in-hom town and out-of-home town areas. Despite the fact that the respondent sample was confined to students, it is plausible to

FIGURE 1: STEPS IN THE EXPERIMENTAL DESIGN

PART I

STEP 1 List of Intown Places (Sample)

1. HOME
2. DAIRY QUEEN
3. CHURCH

etc.

STEP 2 List of Outtown Places (Sample)

1. HOUSTON ZOO
2. LAKE AUSTIN
3. SIX FLAGS

etc.

PART II

STEP 3 Triad Elements (Sample)

1. (Home)

3. (Church)

13. (Grocery Store)

STEP 4 Labelling (Sample)

"Secure"

(Preferred Pole)

"Insecure"

STEP 5 Repertory Grid (Sample)

Place	Constructs			
	Secure	Warm	Relaxation	Etc. ....
1. Home	1	2	4	
2. Dairy Queen	5	3	6	
3. Church	2	4	7	

argue that the few places used for shopping, recreation, visiting friends or family activities are shared by a majority of the "home" town populations. Hence, there is no reason to believe that the elements elicited by the procedure over all students did not comprise a representative sample of the elements of the activity spaces of small town residents in general.

The next task was to define the cognitive bundles of meanings of places inside and outside town (Figure 1, Step 3). The personal constructs for within-town and out-of-town elements, respectively, were elicited from each student separately through the triadic method.[15] Two sets of triads were used. The first set comprised a random drawing of all possible pairs of numbers 2 - 24 combined with 1 (Home). The second set of triads comprised a random drawing from numbers 1 - 24 paired with that number corresponding to the person's most important place after home. Thus, all students were presented in turn with the same sets of triads of numbers, first where the sets represented the places for recurrent travel on their in-town list, and second, where the sets represented places for the recurrent activities on their out-of-town list.

The two numbers within a triad representing the most similar places were set together by the student and defined one pole of the construct; the third was left aside and defined as the contrasting pole. All students were asked to label each pole - what makes these two places similar? this one opposite? (Figure 1, Step 4). They were then asked to state their preferred pole. Triads were presented until no new constructs were elicited. This method of opposites has been found most efficient in test-retest situations, like the present one, requiring the elicitation of bundles of meanings of numerous elements -- in this instance, places.[16] Thus, cognitive meanings which defined places in the activity spaces of each indivdiual were isolated.

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[15] J. Harrison and P. Sarre, "Personal Construct Theory . . . Problems and Methods," op. cit., 368-369.

[16] F. R. Epting, D. I. Suchman, and C. J. Nickerson, "An Evaluation of Elicitation Procedures . . .," op. cit.

Next, each preferred pole of elicited constructs was rank ordered by each respondent. This gave each person's ordering of preferred features defining places for recurrent activities under a transportation system. Consequently, when the results thus far taken all together for all 31 respondents:

(1) considerable cognitive information about many places in different activity spaces had been provided, since the same triads of numbers represented different places for different people;

(2) the amount of information yielded about definitions of places in activity spaces was clearly greater tham that yielded by alternative techniques;[17] and

(3) a range of preferred features defining elements of the transportation-related activity spaces of small town residents had been defined.

In the fifth and final step of the experiment, a "repertory grid" was constructed to estimate the importance of each transportation-related construct for the definition of all places in the activity space of each individual. To construct a grid, each respondent was asked to rate every element (place) on his/her in- and out-of-town list, respectively, according to the quantity of the preferred pole of each construct which the place possessed (1 = very much, and therefore top-rating; 7 = very little, and therefore bottom-rating). The in-town and out-of-town repertory grids for a person summarize the individual's cognitive definitions of every component in his/her activity space. The definitions are comprised of the preferred meanings of places in the activity spaces of small-town residents in general.

The value of the procedure, and of the resultant cognitive definitions of place, can now be illustrated through case studies of the results and their interpretation for selected respondents.

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[17] For example, the technique of multidimensional scaling in Pat Burnett, "The Dimensions of Alternatives in Spatial Choice Processes," Geographical Analysis, Vol. 3 (1973), pp. 181-204.

RESULTS FOR CASE STUDY SUBJECTS

The preferred poles of the constructs of subjects 9, 17, and 29 are arranged in order of their stated desirability in Table 1.

TABLE 1: PREFERRED POLES OF THE CONSTRUCTS OF THREE SUBJECTS

Subject	Category	Top Three Preferred Poles	Total No. Poles
9	Intown	Human relationships, privacy, quiet	13
9	Outtown	Simplicity, scenic, intellectual pleasure	7
17	Intown	Music, beautiful buildings, exciting	14
17	Outtown	Pleasant scenery, being off beaten track, privacy	15
29	Intown	Personal freedom, homey environment, family union	11
29	Outtown	Private, keeps property personal, active environment	11

A comparison of within-town poles between the subjects identifies marked differences in the names, number, and preferential order of the constructs. Similar differences exist between the individuals' constructs defining out-of-town places. Likewise, for each individual the names, number, and preferential order of poles tend to differ depending on whether he/she is considering a within-town place or an out-of-town place. As can be expected, similar magnitudes of variation among the remaining 28 subjects in the sample produce an unwieldy number of individually-defined constructs. However, taken together, a considerable quantity of information is provided concerning the preferred, transportation-related features of activity spaces.

(See Table A.1 in the Appendix, which shows the preferred poles of fifteen of the sample subjects.)

If the essential definitive substance can be extracted from the lists of many individuals' preferred poles, considerable order and parsimony will be achieved in identifying the attributes which give meaning to places for individuals. INGRID[18] performs a modified principal components analysis of each individual's repertory grid to achieve this. The algorithm follows a procedure analogous to Saunder's[19] direct factor method, and uses Bartlett's test, despite its shortcomings,[20] to determine significant principal factors. The results of the principal components analysis for both the within-town and out-of-town grids for three of the case study subjects are presented in Table 2. Through the principal components procedure, the thirty-eight verbal constructs elicited from the three subjects for only within-town places have been reduced to eight components (attributes). These attributes are named, following standard practice, by looking at the construct loadings on components. An illustration of this naming procedure is given in Table 3.

As can be seen in the table, component 1 shows high negative loadings on the subject's preferred poles. The negative loading on this component clearly represents high negative correlation with an evaluative dimension which we have labelled "Approval-Disapproval." Subsequent components (e.g., components 1 and 2) receive their labels from bipolar loadings. The labels are assigned by choosing bipolar terms which seem to express the character of the negative and positive loadings on the poles. For example, component 2 is assigned the bipolar label "Stimulating-Tranquil" on the basis of the negative loadings

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[18] P. Slater, The Principal Components . . ., op. cit. and P. Slater, Notes on INGRID 72, op. cit.

[19] D. R. Saunders, Practical Methods in the Direct Factor Analysis of Psychological Score Matrices (Ph.D. dissertation, Department of Psychology, University of Illinois, Urbana, 1950).

[20] D. N. Lawley and A. E. Maxwell, Factor Analysis as a Statistical Method (London: Butterworth, 1963).

TABLE 2: EXAMPLES OF THE USE OF INGRID: TRANSPORTATION-RELATED COMPONENTS

Subject	Comp. 1	Comp. 2	Comp. 3	% Var. Explained	Total Sig. Comp
9-Intown	Work-Relaxation	Outdoor-Indoor Pasttimes	Access to Services-Access to Entertaining Activities	76.75	11
9-Outtown	Change of Scene-Familiar Environment	Outdoors Sporting-Indoors Intellectual Enjoyment	Less Effort to go Places-More Effort to go Places	97.00	4
17-Intown	Family ties-Friendships	Exciting Socialising-Private Enjoyment	More Effort to go Places-Less Effort to go Places	69.09	6
17-Outtown	Close Relationships-Private Feelings	Approval-Disapproval	Adventure-Security	85.09	6
29-Intown	Informality-Formality in Relationships	Uninterpreted[a]	Lack of Restriction-Restriction	68.47	11
29-Outtown	Social Activity-Private Activity	Outdoor Sports-Indoor Country-Western	Lack of Mobility to Distant Places-Nearby Activities	73.50	6

[a]This subject was chosen to illustrate one of the difficulties of the use of principal components procedures: the naming of attributes.

TABLE 3: EXAMPLE OF COMPONENT NAMING FROM CONSTRUCT LOADING SUBJECT 30 - INTOWN

Preferred Poles In Order of Preference	Comp. 1 Approval-Disapproval	Comp. 2 Stimulating-Tranquil	Comp. 3 Interesting-Uninteresting
Interesting	-.8071	.4040	.2235
Tasteful	-.8647	.3964	.0205
Warm (Emotional)	-.9452	.1505	.1147
Relaxed	-.5899	-.1630	.7080
Comfortable	-.7546	.1480	-.3069
Private	-.6144	-.7031	.1560
Quiet	-.8595	-.3040	-.2498
Neat	-.7250	-.2011	-.4042
Permanent	-.6496	.0192	-.1243
% Var. Explained	58.60	11.32	10.27
% Var. Explained by First Three Components	80.19		

on such terms as "relaxed" and "private" and the positive loadings on such terms as "interesting" and "emotionally warm." (See Table A.2 in the Appendix for examples of component naming for other subjects.)

As with the constructs, differences exist between individuals in their components for within-town grids, out-of-town grids, and the grids for each individual depending on whether he/she was considering within-town places or out-of-town places. Over the entire sample of subjects, however, many components were found to be common to several individuals, but at varying levels of salience. For example, subjects 3, 7, 10, 11, 14, 15, 17, 18, 24, and 26 all had close, secure, or family-like relationships among their first three components defining places they used within-town. Although the components ranged from first to third in importance between individuals, it seems clear that some communality and order in transportation-related definitions of activity spaces is revealed in these data through the use of INGRID.

The benefits of order and parsimony in the principal components approach, however, are accompanied by difficulties inherent in the model. For most grids the technique yields a great many statistically significant components.[21] For example, for subjects 9, 17, and 29, INGRID derived eleven, six and eleven significant components, respectively, from the within-town repertory grids and four, six, and six components, respectively, from the out-of-town repertory grids (Table 2).

This illustrates that the present procedures for searching for cognitive meanings of places will produce a considerable quantity of information in parsimonious form. However, it also demonstrates that there will be some arbitrariness in the final selection of components for further field research or for incorporation into models. Nonetheless, some such degree of arbitrariness is required in these circumstances in any case. Moreover, a pilot study like the present one has the advantage that the subject's, rather than the researcher's, meanings of place can be used in later research.

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[21] P. Slater, The Principal Components..., op.cit., pp. 35-36.

CONCLUSION: THE USE OF COGNITIVE DEFINITIONS OF PLACE

In spite of the difficulties of the procedure so far recognized, its benefits seem clear. From a very large number of differentially-ordered and defined transportation-related constructs of urban activity spaces, a reduced number of operationally feasible attributes may be derived. These attributes, elicited from a small pre-sample, help define places within urban activity spaces in terms of their preferred meanings to individuals.

It remains to illustrate in conclusion how the results of a small-sample study like the present one can be utilized to explain at least one kind of spatial behavior -- in this case, the evaluation of the impacts on activity spaces of different transportation systems.

At least one computerized model is available, INDSCAL,[22] which will measure environmental utility for both individuals and groups under alternative transportation services. One essential requirement of this model is a list of semantic differential scales, with poles opposite in meaning, to define the important attributes of activity spaces under a given transportation system. These scales are then used by individuals to score activity spaces across as wide a range as possible of attributes which they regard as significant. The scores for an individual's activity space under different transportation alternatives are later manipulated to generate the required measures of environmental utility. The necessary semantic scales can obviously be generated by a judicious selection of the components describing activity spaces elicited from a small scale sample like the one above. Additional components can also be supplied, if required, from the literature.[23]

The second essential requirement of the INDSCAL model is that both the attributes and the saliences of the attributes of activity spaces must vary between individuals. The findings of inter-individual heterogeneity in the

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[22] R. N. Shepard, A. K. Romney, and S. B. Nerlove (Eds.), Multidimensional Scaling: Volume 1: Theory (New York; Seminar Press, 1972).

[23] J. Harrison and P. Sarre, "Personal Construct Theory...", op. cit., p. 370.

study above are consistent with this. Accordingly, the cognitive definition of place and the procedures used to define it seem applicable in at least one modeling area: the use of INDSCAL to define the impacts of transportation changes on the environments of population groups.

In keeping with this argument, a survey instrument was designed for use in Sealy, Texas (A.3 in Appendix). Part of the instrument (see pp. 34-36) comprises semantic differential scales derived from the constructs elicited in the study reported on above. In addition, other components were supplied from a historical case study of Sealy.[24] The survey instrument has been administered to a 5% spatially random sample of Sealy households to obtain their evaluation of the likely effects and desirablility of alternative transportation systems on Sealy. This study will be reported in a later document.

There certainly remain methodological and conceptual problems too numerous to go into here (e.g., especially problems of aggregation and ecological fallacy). However, a tentative conclusion can perhaps be reached. The quantity of information provided through the individual's cognitive definition of place may in due course permit better explanation of different kinds of behavior of important concern: for example, not only transportation impacts but also residential choice and recurrent travel behavior.

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[24] Graham Hunter, "Rural Communities and Interurban Transportation Systems: A Study of the Stages of Interaction," unpublished Master's Thesis, The University of Texas at Austin, 1974. (Publication forthcoming.)

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A.1: PREFERRED POLES OF THE CONSTRUCTS OF FIFTEEN SUBJECTS

TABLE A.1: PREFERRED POLES OF THE CONSTRUCTS OF FIFTEEN SUBJECTS

Subject	Category	Preferred Poles	Total No. of Poles
1	Intown	Intimacy, Secure, Controlled Environment, Comfortable Surroundings, Freedom of Choice, Comfort, Convenient, Discipline, Less Pressure, Obligated, Outdoor, Duty, Inhibited, Unstructured	14
1	Outtown	Quiet, Personal, Intimate, Unpopulated, At Ease, Exciting, Relaxing, Free, Outdoor, Homely, Economical, Open, Tranquil, Accessible, Smaller	15
3	Intown	Happiness, Fun, Relaxation, Gathering of Friends, Peer Relationships, Talking, Freedom, Background Similarity, Old Building, Driving, Away From Home	11
3	Outtown	Accessible, Change of Atmosphere, Cultural-Educational Experiences, Freedom to Experience New Things, Buying, Security, Fun, Freedom, Familiar Surroundings, Family-or Friend-related Activity, Sight seeing	11
6	Intown	Peaceful, Natural, Quiet, Free, Informal Pleasant, Fun, Pretty, Relaxing, Routine Required Activities	11
6	Outtown	Natural, Pretty, Simple, Friendly, Scenic, Freedom, Unrestricted, Uninhibited, Convenient, More Accessible, Social Activity	11
7	Intown	Social Interacting, Love, Outdoor, Unrestricted, Socialized, Relaxing, Pleasure, Peaceful, Friendly, Affectionate, Recreational, Fun, Guidance, Familiar, Historical	15
7	Outtown	Personal, Peaceful, Calm, Private, Outdoor, Luxury, Pleasure, Sentimental, Familiar Atmosphere, Non-commercial, Convenient	11

TABLE A.1 (Continued)

Subject	Category	Preferred Poles	Total No. of Poles
9	Intown	Humanizing Relationships, Privacy, Quiet, Relaxation, Freely Chosen Routine Activities, Physical Refreshment, Stimulating Entertainment, Intellectual Stimulation, Pleasant Outdoor Scenery, Convenient Routine Activities, Things Accessible but Together, Little Effort by Car, Luxuries	13
9	Outtown	Simple, Scenic, Intellectual Pleasure, Pleasant/Enjoyable Sensations, Changed Scenery, Accessible with Less Effort	7
10	Intown	Secure, Individual, Familial, Stability, Calm, Close and Personal, On One's Own, Present and Future Orientation, Relaxed, Uninhibited, Pleasure Oriented, Youth	12
10	Outtown	Familiar, Special, Familial, Close (Friendship), Recreational, Open Possibility for Activity, Casual, Informal, Unorganized, Uncrowded, Conservative	11
11	Intown	Friendly, Personal, Secure, Leadership, Friendship, Guidance, Enjoyable, Social Activities-Relaxed, Relaxing, Routine, Unrestricted, Large, Different, Unpopulated, Noisy	15
11	Outtown	Individual, Personal, Obedience, Familiar Homely, Growing, Antique (Traditional), Social Activities, Enjoyable, Entertaining, Natural, Routine, Accessible, Convenient, Exciting	15
14	Intown	Affectionate, Activity, Natural, Pleasure, Close-Familiar, Friends, Respect, At Ease, Socially Open, Relaxing, Public, Structurally Varied, Boisterous, Financial Options	14
14	Outtown	Enjoyable, Friendly, Natural, Recreational Outdoors, Involved, At Ease, Fun, Public, Familiar, Educational, Near Family Activities, Quiet, Unstructured, Free Options	15

TABLE A.1 (Continued)

Subject	Category	Preferred Poles	Total No. of Poles
15	Intown	Intimate Friendship, Route Learning, Personal Freedom, Privacy, Father's Interests, Intellectual Involvement, Peer Friendships, Shared Enjoyment of Outdoors, Relaxation, Public Activities	10
15	Outtown	Activities with Others, Recreation, Pleasure with Peer Group, Enjoyable Family Activities, Beauty of Landscape,	6
17	Intown	Music, Beautiful Buildings, Exciting, Enjoyable, Degree of Involvement, Family Association, Intimate Contact with People, Role Playing, Socializing with Peers, Social Grouping, More Distant Peer Relationships, Domestic Activities or Chores, Freedom, Functional, Makes Place Accessible	15
17	Outtown	Pleasant Rural Environment, Off the Beaten Track, Privacy, Challenging, Access to Friend's House, Freedom from Personal Corruption, Victimization, Enjoyable Sensations, Belief in Places, Geographical Separation, Family Companionship, Family Kind of Relationship, Family Activities, Direction, Access to School	15
20	Intown	Scientific and Technical Background, Peaceful, Sexual Interest, Close and Friendly Relationships, Close Friend Relationship, Socializing Atmosphere, Special Friends, Science Related Conservation, Enjoyable, Academic Atmosphere, Entertaining and Recreational Activities, Less Accessible Relationships, Brother's Interests, Family Sporting, Social Entertainment	15

TABLE A.1 (Continued)

Subject	Category	Preferred Poles	Total No. of Poles
20	Outtown	Social Activities, Normal Everyday Activities, Drinking and Social Entertainment, Interrelated Activities, Combined Activities, Combined Recreational Activities, Academic Activities Outdoor Activity Groups, Family and Social Activities, Everyday Family Activities, Family Socializing, Same Activities, Combined Family Activities, Accessible Family Related Activities, Inaccessible Trip	15
22	Intown	Security and Love, Solitude, Freedom, Getting Out, Accomplishment, Scenery, Fulfilling, Relaxing, Same Activities, Parties and Sports, Enjoying Getting Together with Friends, Fun, Conversation, Location, Location Related Activities, Laziness	15
22	Outtown	Grew Up in the Place, Achievement, Memories, Friendly Atmosphere, Nature, Freshness, Variety, Easy Going, Relaxing, Fun, Gathering of Friends, Outdoor Activity, Recreation, Dating, Distance	15
25	Intown	Informal, Supportive, Happier, Friendly, Stable, Comfortable, Quiet	7
25	Outtown	Familial, Belonging, Togetherness, Enjoyable Frequent, Exciting, Peaceful, Casual	8
29	Intown	Free, Homey Environment, Family Union, Historical, New People, Personal Interaction, Groups of People, Social, Recreational, Role Playing, Unrestricted Play	11
29	Outtown	Private, Personal Property, Personal Activity Social, Watersports, Rural, Animals, Natural, Outdoors, Active, Stationary	12
30	Intown	Interesting, Tasteful, Warm (Emotional), Relaxed, Comfortable, Private, Quiet, Neat, Permanent	9
30	Outtown	Varied, Beautiful, Unexplored, Quaint, Open, Undisturbed, Tranquil, Mobile, Active	9

A.2: EXAMPLES OF THE USE OF INGRID: TRANSPORTATION-RELATED COMPONENTS

TABLE A.2: EXAMPLES OF THE USE OF INGRID: TRANSPORTATION-RELATED COMPONENTS

Subject-Category	Component 1	Component 2	Component 3	% Variation Explained	Total Significant Components
1-Intown	Freedom-Restriction	Convenient-Outdoors Environment-Secure Comfortable Environment	Secure-Insecure	77.80	12
1-Outtown	Intimate and Quiet Impersonal and Exciting	Homely-Sophisticated	Relaxing Rural Environment-Stimulating Urban Environment	81.69	3
3-Intown	Lots of Fun with Friends-Little Fun with friends	Warm Relationships-Loneliness	Close Personal Relationships-Distant Personal Relationships	83.26	3
3-Outtown	New Experiences-Familiar Experiences	Routine Travel-Travel for Adventure	Shared Pleasure with Relatives-No Shared Pleasure with Relatives	85.30	7
6-Intown	Peaceful Environment-Irritating Environment	Fixed Routine-Freedom	Not Significant	62.28*	2
6-Outtown	Approval-Disapproval	Accessibility to Places-Accessibility to People	Socialization in Town-Freedom in an Attractive Countryside	87.51	5
7-Intown	Guided Interactions-Unrestricted Pleasure	Pleasurable Private Outdoor Activities-Loving Relationships	Traditional Family Ties-Fun with Peer Groups Activities	71.05	6

TABLE A.2 (Continued)

Subject-Category	Component 1	Component 2	Component 3	% Variation Explained	Total Significant Components
7-Outtown	Guided Interaction-Unrestricted Pleasure	Pleasurable Private Outdoor Activities-Loving Relationships	Traditional Family Ties-Fun with Peer Group Activities	71.05	6
9-Intown	Work-Relaxation	Regular Outdoor Pastimes-Indoor Pastimes	Access to Serious Activities-Access to Entertainment	76.75	11
9-Outtown	Change of Scene-Family Environment	Enjoying Outdoor Sports-Indoor Intellectual Enjoyment	Less Effort to Go Places-More Effort to Go Places	97.02	4
10-Indoors	Family Stability-Individual Freedom	Peace and Security-Personal Pleasure-Seeking	Not Significant	46.22*	2
10-Outdoors	Progressive-Conservative	Family Relations-Special Friendships Outside Family	Traditional Family Pastimes-Recreation with Friends	78.48	6
11-Intown	Environment with Secure Personal Relations-Environment with Insecure Personal Relations	Large, Diverse Social Gatherings-Isolation	Freedom-Restraints	65.03	3
11-Outtown	Exciting Social Activities-Isolation	Parental Control-Adventure With Friends	Natural Self-Playing Roles	70.86	5
14-Intown	Public Dealings-Private Dealings	Close Relationships-Distant Relationships	Financially Rewarding Environment-Emotionally Rewarding Environment	67.81	4

TABLE A.2 (Continued)

Subject-Category	Component 1	Component 2	Component 3	% Variation Explained	Total Significant Components
14-Outtown	Public Dealings-Private Dealings	Family Involvement-Free Activities	Outdoor Activities-Indoor Activities	77.36	9
15-Intown	Public Activities-Private Activities	Outdoor Recreation-Indoor Intellectual Involvement	Close Personal Relations-Interest and Activities of Others	84.54	6
15-Outtown	Approval-Disapproval	Family Activities-Activities with People Outside the Family	Social Contacts-Private Rural Recreation	89.63	4
17-Intown	Family Relationships-Friendships	Exciting Activities with Others-Private Enjoyments	More Effort-Less Effort	69.09	6
17-Outtown	Close Relationships with Others-Private Feelings	Approval-Disapproval	Adventure-Security	85.29	6
20-Intown	Good Working Environment-Relaxation	Access to Scientific Knowledge-Friendships	Sporting Activities-Friendships	75.77	5
20-Outtown	Enjoyable Social Activities with Friends-Activities with Family	Routine Activities with Peers-Routine Family Activities	Outdoor Activities-Indoor Family Activities	65.78	6
22-Intown	Approval-Disapproval	Solitary Rural Activities-Urban Social Activities	Relaxing Privacy-Enjoyable Relations with Others	75.33	5

TABLE A.2 (Continued)

Subject-Category	Component 1	Component 2	Component 3	% Variation Explained	Total Significant Components
22-Outtown	Approval-Disapproval	Familiarity with People and Places-Freshness and Variety of Outdoor Scenery	Not Significant	47.58*	2
25-Intown	Approval-Disapproval	Not Interpretable	Enjoyable-Dull	88.73	4
25-Outtown	Exciting-Familiar	Rooted-Rootless	Stimulating Companionship-Peaceful Family-Relations	85.72	7
29-Intown	Informal Group Recreation-Formal Group Recreation	Not Interpretable	Unrestricted Activities Away from Home-Role Playing at Home	68.45	3
29-Outtown	Outdoor Social Activity-Private Activity	Outdoor Sports-Indoor Country and Western Activities	Lack of Mobility to Distant Places-Outdoor Activities Nearby	73.50	6
30-Intown	Approval-Disapproval	Stimulating-Tranquil	Interesting-Uninteresting	80.19	3
30-Outtown	Tranquil-Active	Challenging-Unchallenging	Peacefulness-Adventure	76.34	3

A.3: SEALY, TEXAS SURVEY

The first part of this questionnaire is to help us collect some information on your household and its travel habits. This is because different transportation proposals affect different kinds of household in different ways. You may, of course, refuse to answer any question.

PART A	Margin for Computer Coding of Answers
1. Length of Residence	
a. In what year did you move to live in Sealy?_____	_____
b. How many years have you lived in Sealy altogether?_____years.	_____
2. Household Characteristics	
a. How many persons are there in this household?_____	_____
b. Note your present occupation, or occupations, below.	
1._____	_____
2._____	_____
3._____	_____
c. How many years of schooling have you completed?_____years.	_____
d. How many cars does you household own?_____	_____
e. In what country were you born?_____	_____
f. How many rooms are there in this dwelling?_____	_____
g. In which of the following age groups do you belong? Check One	
Under 18_____ 35 and under 45_____	
18 and under 25_____ 45 and under 55_____	_____
25 and under 35_____ 55 and under 65_____	
65 and over_____	
h. Estimate the value of <u>your own</u> earnings and other assets for 1973-74, before taxation deductions $_____	_____

2. Continued

i. Fill in the following table for each other person in your household.

Relationship to you	Occupation	Age	Hours worked per week for last 6 months			
1.						
2.						
3.						
4.						
5.						
6.						
Continue on blank page at end if necessary						

j. How many hours per week have you worked on average for the last six months?_____hours/week. _____

k. What is your religion?_____ _____

l. Estimate the value of your household's total earnings and other assets for 1973-74, $_____ _____

m. Estimate the current total average weekly income of your household, $_____ _____

n. How many bathrooms does your household have?_____ _____

3. Sealy Affairs

a. What organizations in Sealy do you belong to? List them below. If you hold an official position in any organization, list the title alongside.

3. Continued

	ORGANIZATION	POSITION		
1.				
2.				
3.				
4.				

(Continue on blank page at end, if necessary)

b. Since 1965, have you belonged to a group to press for change in Sealy?

Yes_____ No_____

Briefly give the reasons for your joining or not joining such a group.

4. Travel Behavior

a. Complete the following table, to show the places inside or outside Sealy, which you normally use for different activities. Leave a blank space if any part of the table is not applicable.

Activity	Most Preferred Place		Estimated Travel Time From Home
	Name	Visit Frequency*	
Shop for groceries			
Shop for fashion clothing			
Shop for a car			
Banking			
Use barber or beauty salon			
Visit doctor			
Indoor recreation			
Outdoor recreation			
Visit friends			
Visit relatives			
Go to a movie			
Use a restaurant			
Use a library			
Go out with close friends			
Take visitors out			

*e.g., Number of visits per week, per month, per year. Please state the time period concerned.

b. If you are gainfully employed, what is the name and street address of your most important place of employment?

Name_____

Street Address_____

The second part of the questionnaire tries to find out how you would rate Sealy as a place to live under different kinds of transportation system. Six kinds of system are listed across the page. One comprises present facilities, the others are just suggestions. Down the page you will find attributes of Sealy which the existence of each system might affect. Rate Sealy under each system, using the following method. Take each attribute in turn, and place a score for the effects on Sealy of each transportation alternative; 1 = very advantageous
7 = very disadvantageous

PART B

ATTRIBUTES OF SEALY LIVING	PRESENT FACILITIES AFTER IH 10 1	FACILITIES BEFORE IH 10 STARTED 2	PRESENT FACILITIES + AMTRAK STOP 3	PRESENT FACILITIES + IMPROVED BUS 4	PRESENT FACILITIES W/O BUS SERVICE 5	PRESENT FACILITIES + AIRSTRIP FOR INTRASTATE CARRIERS 6
A. Economic-Public						
1. Attractiveness to industry						
2. Attractiveness to retailing/ offices						
3. Your household income						
4. Community land values						
5. Your neighborhood land values						
6. Population growth						
B. Personal						
1. Preservation of family ties & friendships						
2. Enjoyable outdoor recreation with others						

CONTINUED

ATTRIBUTES OF SEALY LIVING	PRESENT FACILITIES AFTER IH 10 1	FACILITIES BEFORE IH 10 STARTED 2	PRESENT FACILITIES + AMTRAK STOP 3	PRESENT FACILITIES + IMPROVED BUS 4	PRESENT FACILITIES W/O BUS SERVICE 5	PRESENT FACILITIES + AIRSTRIP FOR INTRASTATE CARRIERS 6
3. Personal freedom						
4. Country-Western activities						
5. Access to sophisticated entertainment						
6. Restraints on behavior because everyone knows you						
7. Challenge, excitement, & adventure						
8. Informality of relationships						
9. Access to luxuries of life						
10. Pressure to achieve						
11. Peace, tranquillity						
12. Relaxation; relaxed environment						
13. Attractive rural surroundings						
14. Intellectual stimulation						
15. Accessibility to people & places						

CONTINUED

ATTRIBUTES OF SEALY LIVING	PRESENT FACILITIES AFTER IH 10 1	FACILITIES BEFORE IH 10 STARTED 2	PRESENT FACILITIES + AMTRAK STOP 3	PRESENT FACILITIES + IMPROVED BUS 4	PRESENT FACILITIES W/O BUS SERVICE 5	PRESENT FACILITIES + AIRSTRIP FOR INTRASTATE CARRIERS 6
16. Personal privacy						

Finally, would you give us your telephone number in case we need to check back with you over some parts of this questionnaire? _____.

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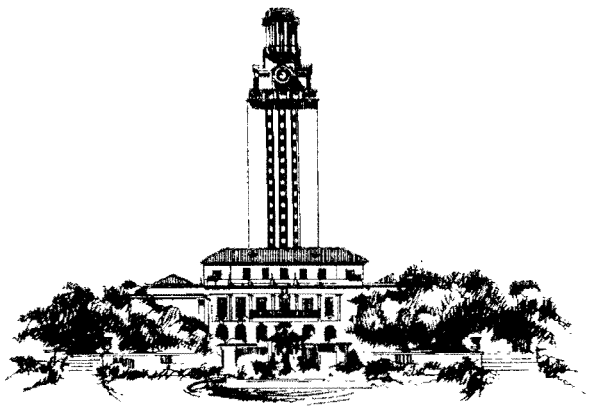

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