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CLIENT RESPONSES TO HOUSING REQUIREMENTS: THE FIRST TWO YEARS

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see page 31, 33 for the bottom line.

This Note was prepared for the DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, under Contract No. H-1789. It is intended to facilitate communication of preliminary research results. Views or conclusions expressed herein may be tentative and do not represent the official opinion of the sponsoring agency.

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PREFACE

This working note was prepared for the Office of Policy Development and Research, U.S. Department of Housing and Urban Development (HUD). It analyzes the sequences of housing-related choices made by enrollees in the experimental housing allowance programs being conducted in Brown County, Wisconsin, and St. Joseph County, Indiana, as those enrollees seek to qualify for allowance payments. The study emphasizes the interplay between case actions by the housing allowance office and responses by the enrollees, and shows how the outcomes relate to household and housing characteristics.

The research on which this note is based was done by Bruce W. Lamar during the spring and summer of 1977. Lamar was then a graduate student in management at the University of California, Los Angeles (UCLA), and a consultant to Rand. His report on this research was submitted in 1978 to UCLA as a master's thesis. For this note, the thesis material was revised and extended by Ira S. Lowry.

Iao Katagiri, Ann Wang, and Robert Young prepared the master files of program records that served as a data base for Lamar's analysis. The draft text and tables of this note were typed by Ned Harcum and the graphics were prepared by Dwight Williams and Adaline Chastain. The draft was reviewed by Lamar (now a graduate student in operations research at Massachusetts Institute of Technology), James L. McDowell, and Daniel A. Relles.

Charlotte Cox edited the text and supervised the production of final copy, which was typed by Joan Pederson.

This note was prepared pursuant to HUD Contract H-1789, Task 2.11.

SUMMARY

Experimental housing allowance programs in Brown County, Wisconsin, and St. Joseph County, Indiana, offer monthly cash payments to low-income renters and homeowners, provided that their dwellings meet certain standards. This study traces the housing actions enrollees took to qualify for payments during the first two years of program operations. The analysis is based on records for 4,213 enrollees in Brown County and 5,782 in St. Joseph County.

About half of all preenrollment dwellings in each site failed their initial evaluations. The most common defects were stairways lacking handrails, too few habitable rooms, inadequate bathrooms, and unsafe utility systems. The enrollees whose dwellings most often failed were those with large households, those headed by elderly persons or nonwhites, and those living in inexpensive homes. Failure rates for renters and homeowners were similar overall.

About 95 percent of the enrollees whose dwellings were initially acceptable stayed in them and began receiving allowance payments. Only a few moved or terminated enrollment before payments were authorized. The behavior of those in unacceptable dwellings was more diverse. About two-thirds repaired, a tenth moved, and over a fifth terminated their enrollment without ever qualifying for payments.

In general, the worst dwellings were the least likely to be repaired, the occupants usually choosing either to move or to terminate. Homeowners, for whom moving is difficult, were more likely to repair than renters and less likely to move. Controlling on tenure, the elderly were more likely to repair and less likely to move than younger households. Controlling on age of head, owners and renters were equally likely to terminate rather than repair or move. The data strongly suggest that occupants of unacceptable dwellings decided on their next actions (repair, move, or terminate) without much exploration of alternatives.

During the two years covered by our data, 83 percent of all enrollees in Brown County and 78 percent in St. Joseph County achieved

certification of at least one dwelling. Combining data for the two sites, about 45 percent of all enrollees achieved first certification without effort, inasmuch as their preenrollment dwellings were acceptable to the HAOs. About 30 percent achieved certification by repairing those dwellings and 5 percent by moving; many of the movers also repaired their new homes.

Among those who did not achieve certification, whether they were terminated or still enrolled at the closing date for the file, the striking fact is that few tried very hard to do so. For only 8 percent of that group do we have any evidence of a repair action or a move that might have led to certification.

In both sites, certification was most likely for elderly homeowners with incomes under $4,000 and least likely for their opposites, nonelderly renters with incomes over $4,000. Although the severity of the certification obstacles varies for different client groups, the data indicate that few who try to remedy their dwellings' defects fail to achieve certification, either by repairing or moving. Those with the lowest incomes and therefore the largest allowance entitlements are most likely to make the effort; homeowners try harder than renters.

Within the year following first certification and commencement of payments, 27 to 29 percent of the allowance recipients in each site terminated their enrollments and 6 to 10 percent moved. The terminations mostly reflect loss of eligibility, whereas the moves reflect the movers' dissatisfaction with their HAO-approved dwellings. Among the movers, 90 percent in Brown County and 73 percent in St. Joseph County again achieved certification before the close of file.

About two-thirds of all recipients stayed in their first certified dwellings until annual evaluations were due. Those evaluations indicate that about a fifth of the dwellings in Brown County and a third in St. Joseph County had fallen below program standards during the year following first certification. In order to continue as allowance recipients, the occupants had to repair the new defects or else move to acceptable housing.

Future research into program-related housing decisions can benefit from our improved method of detailing client histories and the

correction of errors found in the HAO records. The relationships found in the present study between housing decisions and clients' household and housing characteristics lead to several behavioral hypotheses that should be rigorously tested.

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I. INTRODUCTION

The Housing Assistance Supply Experiment (HASE) offers cash assistance (housing allowances) to low-income renters and homeowners to help them with housing expenses. To receive an allowance, an enrolled household must occupy a dwelling that meets standards as to size, physical facilities, and condition. Because roughly half the preenrollment dwellings are deficient in those respects, many enrollees must either repair their dwellings or move to qualify for payments. Others need not alter their housing circumstances but may do so with the aid of their allowances. Some drop out without ever qualifying for payments.

This note distinguishes the alternatives facing each enrollee, reports his choices, and analyzes the associated factors. The findings bear directly on the effectiveness of the allowance program, whose premise is that, given cash assistance, most low-income families can solve their own housing problems. The study also prepares the way for an analysis of constrained client choices, showing which of the complex decision-sequences are empirically dominant.

The data cover the first two years of program operations in each experimental site: Brown County, Wisconsin, and St. Joseph County, Indiana.* During those years, 4,977 households in Brown County and 7,265 in St. Joseph County enrolled in the program.

HOW THE PROGRAM WORKS

In each site, the program is administered by a housing allowance office (HAO) that invites applications, interviews applicants, enrolls those who are eligible, and informs them of their allowance entitlements. Both eligibility and allowance entitlement are based primarily on income and household size; the allowance schedule is designed to enable each participant to afford decent, safe, and sanitary housing

*The sites, their populations, and their housing markets are described in the *Third Annual Report of the Housing Assistance Supply Experiment*, The Rand Corporation, R-2151-HUD, February 1977.

in the local market without spending more than a fourth of nonallowance income for that purpose.*

Once an applicant is enrolled, the HAO evaluates his current dwelling. A trained inspector visits the dwelling and checks its features against 37 standards of housing quality. A dwelling that meets all is certified and the occupant authorized for payments.** Each dwelling is reevaluated annually to ensure that it still meets the standards.

A client whose dwelling fails has three choices: He may arrange for repairs, move to another dwelling, or forgo allowance payments. After a dwelling is repaired, it is reevaluated. Movers must arrange evaluations of their new homes, preferably before moving. The occupant of a dwelling that passes either a postrepair reevaluation or a premove or postmove evaluation then begins to receive payments. If the dwelling fails, the client is faced with the same three choices: repair, move, or forgo payments. There is no time limit for carrying out repairs after an evaluation failure, but neither does the client benefit from enrollment while living in an uncertified dwelling.

A client may also move from a certified dwelling, either voluntarily or because he is evicted. To continue receiving payments, he must locate a suitable home and have it certified by the HAO within a month after moving. Failure of an annual evaluation results in suspension of payments unless repairs are completed within 75 days or the client moves to an acceptable dwelling.

HOUSING DECISION TREES

Given the program structure, many sequences of evaluations and client decisions are possible, the number increasing with the duration of enrollment. To represent the alternatives clearly and in a form that lends itself to analysis, we constructed a housing decision tree*** for each site and mapped onto it the number of clients following each path. The trees are shown in Figs. 1 and 2 (following p. 4).

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*Appendix A summarizes the eligibility rules and housing standards.

**A renter must also enter a lease agreement with his landlord and provide the HAO with a copy.

***The tree differs from the classical decision tree in two respects. First, the classical tree represents optimal rather than actual

The decision path for each client was constructed by chronologically ordering two classes of events: his housing evaluations and his housing decisions. Although several types of housing evaluation may be conducted for a particular client, each has only two possible outcomes: The dwelling may be found acceptable for initial or continued occupancy by the client, or it may be found unacceptable. If the dwelling is acceptable, the client may do one of the following:

- o Stay in that dwelling and draw a monthly allowance.
- o Move to another dwelling and call for its evaluation.
- o Terminate his enrollment.

If the dwelling is unacceptable, he has four choices:

- o Repair the unacceptable dwelling and call for its reevaluation.
- o Stay enrolled and continue living in that dwelling without drawing an allowance.
- o Move to another dwelling and call for its evaluation.
- o Terminate enrollment.

The choices for both an acceptable and an unacceptable dwelling presume that the client lives in the evaluated dwelling. Following a premove evaluation, however, he may choose to either move or not move into the evaluated dwelling. If he does not move, the last evaluation of the dwelling he occupies still conditions his next decision. If he does move, the choices revert to those indicated above, depending on the outcome of the premove evaluation.

Some clients call for premove evaluations on several dwellings, then move to only one or none of them. Since the evaluations on never-occupied dwellings are without issue, they were eliminated from the chronology represented in the decision tree.*

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decisions. Second, decisions in the classical tree are contingent on random events, whereas HAO clients can affect the outcome of the housing evaluations on which subsequent decisions are based.

*The frequency of such evaluations is discussed in Sec. III.

Having traced each client's history, we grouped those whose histories were identical up to a given branch of the tree and entered the counts at the appropriate places in Figs. 1 and 2. Thus, in Brown County, 2,073 enrollees failed their initial evaluations; whereupon 208 moved, 402 terminated, and 1,275 repaired the failed dwelling. Numbers in parentheses represent those who, at the close of file, had not made the next decision; in the case at hand, 188 households were still enrolled and still living in failed preenrollment dwellings but not drawing payments.*

The figures encompass up to six sequential decisions for each client, each pair of decisions separated by a housing evaluation. Some clients had been enrolled long enough to make more than six decisions; they are counted in square brackets at the terminus of the appropriate branch.** Each possible branch is traced either through six decisions or until no clients remain on the branch.

RECORD SELECTION

Because of missing or contradictory information, some clients' records were excluded from both the decision trees and the analysis. For Brown County, we selected 4,213 usable records, which account for 85 percent of all those who enrolled during the first two years. For St. Joseph County, we selected 5,782 usable records, or 80 percent of all enrollees. Table 1.1 accounts for the deleted records. In each site, three-fourths of those deleted lacked complete evaluation histories. Most of the remaining deletions apparently were due to errors in evaluation dates that confused the chronology.***

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*Note that the account is closed at each decision node: 2,073 = 208 + 402 + 1,275 + 188.

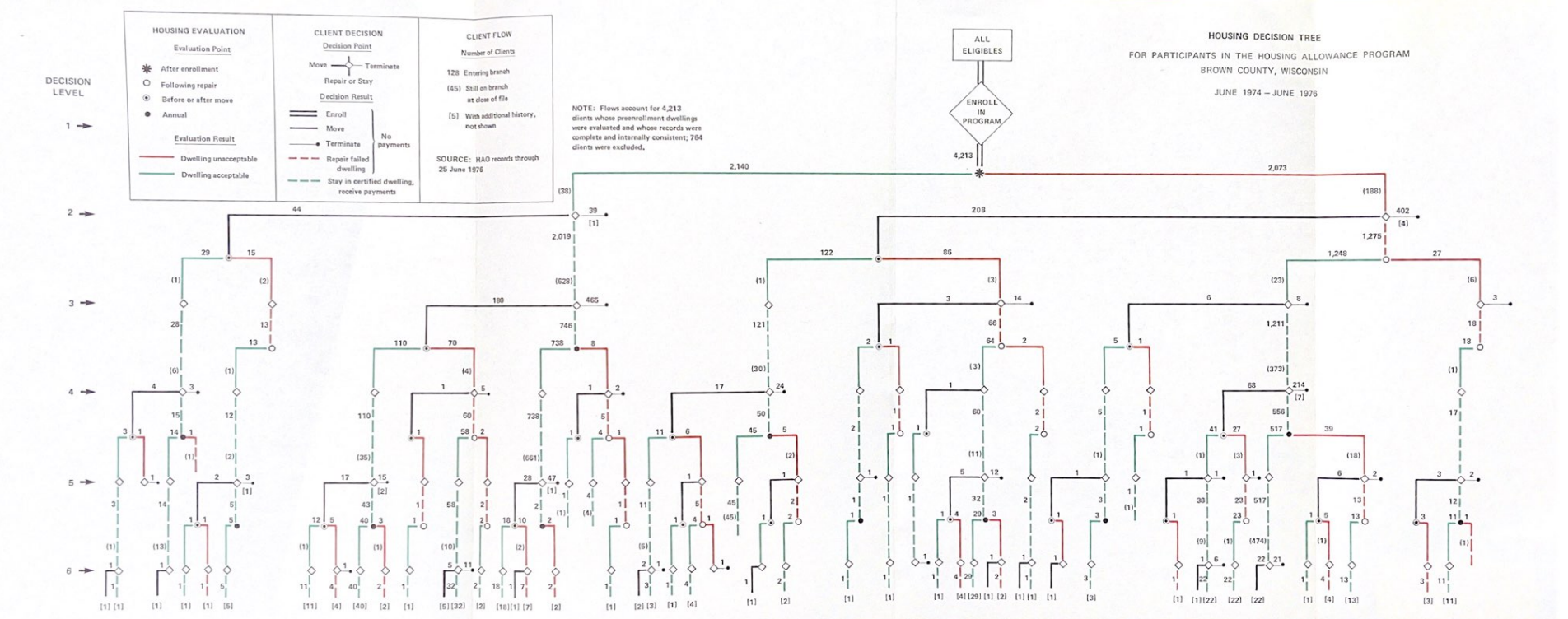
**A few clients who terminated but were later reinstated are also counted in square brackets at the termination points. Their histories after reinstatement are not shown.

***Because this analysis was the first to organize housing evaluation records chronologically, it served also as an audit of chronology. An apparent chronology error might actually reflect an error in a client or housing unit identification code which caused a record to be misplaced in the file.

HOUSING DECISION TREE

FOR PARTICIPANTS IN THE HOUSING ALLOWANCE PROGRAM
BROWN COUNTY, WISCONSIN

JUNE 1974 – JUNE 1976



HOUSING DECISION TREE

FOR PARTICIPANTS IN THE HOUSING ALLOWANCE PROGRAM
ST JOSEPH COUNTY, INDIANA

DECEMBER 1974 – DECEMBER 1976

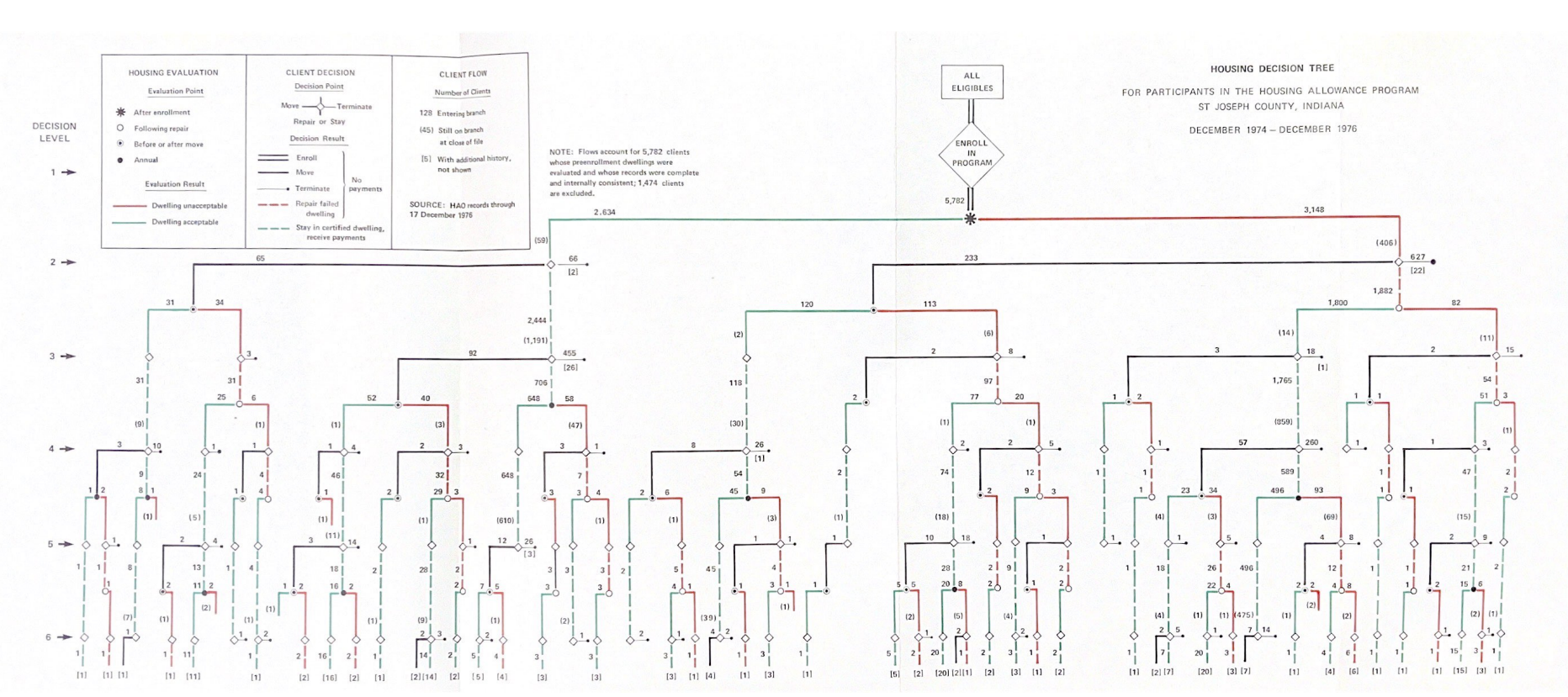


Table 1.1

RECORD SELECTION FOR HOUSING DECISION TREES

Item	Brown County		St. Joseph County	
	Number of Records	Percent of Deleted Records	Number of Records	Percent of Deleted Records
Usable records	4,213	--	5,782	--
Deleted records, by reason:				
No completed evaluation	246	32.2	431	29.2
Missing, incomplete, or multiple initial evaluation	317	41.5	677	45.9
Chronology error for:				
Deficiency reevaluation	35	4.6	146	9.9
Move evaluation	21	2.7	35	2.4
Annual evaluation	53	6.9	126	8.5
Reinstatement evaluation	7	.9	11	.7
Special evaluation, reason unspecified	60	7.9	26	1.8
Duplicate record or coding error	25	3.3	22	1.5
Total deleted	764	100.0	1,474	100.0
All records	4,977	--	7,256	--
Usable as percent of all records	84.6		79.7	

SOURCE: Tabulated by the author from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Percentages may not add exactly to 100.0 because of rounding.

The absence of a usable housing evaluation record does not necessarily or even usually indicate an error in the HAO record systems. Most clients for whom no completed evaluation was on file had recently enrolled, and their initial evaluations had yet to be conducted or processed. Those missing an initial evaluation were sometimes residents of public housing units, which were not evaluated as a matter of HAO policy; others had evaded initial evaluations by moving immediately after enrolling; and a few owners or landlords refused to permit an evaluation.*

*Occupants of federally subsidized housing could enroll in the program but could not draw allowances until they moved to a certified, unsubsidized dwelling. Enrollees who planned to move were understandably impatient with the HAO's wish to evaluate their preenrollment

Because missing initial evaluations are usually associated with movers, the data in this report consistently underrepresent the proportion of enrollees who first obtained certified housing by moving. They were omitted because they would have doubled the complexity of the decision trees and the related analyses without adding substantially to our understanding of clients' responses to evaluation failures.

The other record deletions are less troublesome. The largest group is recent enrollees whose dwellings had not been evaluated at the closing date for the file; we do not think their records, when available, will differ substantially from those analyzed here. There may be a slight bias against clients who had been enrolled a long time, because their housing evaluation histories would be more extensive and therefore more prone to error. The excluded records with special evaluations reflect particular housing problems or concern special types of clients, but are numerous only in Brown County.

ANALYSIS OF THE DECISION TREE

The remainder of this note reports our analysis of housing evaluations and subsequent client decisions, following the sequence in the decision trees. Section II describes the initial evaluations of clients' dwellings, reporting the nature of the housing defects that were discovered and the client characteristics associated with better and worse housing. Section III analyzes clients' first decisions following the initial evaluation, including those whose enrollment dwellings passed as well as those whose enrollment dwellings failed, but emphasizing the latter. Both the severity of the defects and the characteristics of the clients are considered potential influences on postevaluation decisions to repair, move, or terminate enrollment.

About four-fifths of all enrollees eventually obtained certified housing and thus qualified for payments. Section IV analyzes the

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homes purely for research purposes, so sometimes stalled until they had in fact moved; whereupon the HAO had no persuasive argument for obtaining the owner's permission to evaluate the vacated unit and did not attempt to do so.

alternative routes to that outcome and the housing and client characteristics associated with success or failure.

Section V briefly reviews the histories of those who achieved certification, focusing on events during the first postcertification year. Some moved and others terminated their enrollments; those who remained in their first certified dwellings for a full year were administered annual housing evaluations. Regrettably, our records for the last group contain ambiguities that affect the accounting for annual evaluations and inhibit the analysis of evaluation results. A more detailed study of postcertification decisions and housing evaluations must await improvements to the data base.

Inasmuch as this study was our first attempt to compile detailed client histories from HAO administrative records, its main value is as guidance for future research. Section VI reviews the strengths and weaknesses of the logical structure imposed on the data and suggests improvements for future decision trees. Compiling the data in this form also served as an audit of HAO records, revealing gaps, errors, and ambiguities. We summarize those problems and suggest how they may be resolved in future file preparation. Finally, we review the salient empirical findings from this study and propose hypotheses to be tested.

Readers unfamiliar with the experimental housing allowance program will find a summary of program standards and procedures in Appendix A. It includes a brief statement of eligibility criteria, a more detailed summary of housing standards, and a procedural account of the steps between enrollment and payment authorization.

Appendix B explains how we compared alternative models of the household characteristics affecting certification success to choose the variables analyzed in Sec. IV.

II. INITIAL EVALUATION RESULTS

Shortly after a client enrolls in the program, his dwelling is examined by a trained evaluator from the HAO. The evaluator's checklist comprises 37 items, some of which relate to exterior property condition, some to the interior of the dwelling, and some to specific rooms.* The items reflect standards of three types: for living space (with adequate heat, light, ventilation, and privacy), for essential domestic facilities in good working order (plumbing, cooking equipment, utility services), and for hazards to the occupants' health or safety. A failure rating on any one of the 37 items disqualifies the dwelling for occupancy by an allowance recipient.

This initial evaluation is important for two reasons. First, the results indicate the quality of the enrollee's housing, especially if the types as well as the number of defects are considered. Second, the results set the stage for the enrollee's next housing decision. If no defects are reported, the dwelling will be promptly certified and (if supporting documents are all in order) allowance payments will be authorized for its occupants. Otherwise, the enrollee must either repair the dwelling or move to an acceptable one in order to qualify for payments.

This section reports the frequencies with which preenrollment dwellings passed or failed their initial evaluations and describes the defects encountered in failed dwellings. It then shows how evaluation results vary with selected household characteristics. That information provides a background for the analysis of subsequent housing decisions.

EVALUATION RESULTS

Only about half the enrollees selected for this study occupied dwellings that met HAO standards. As shown below, evaluation failures were more common in St. Joseph than in Brown County:

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*The checklist is summarized in Appendix A.

	Cases	Evaluation Result (%) Acceptable	Unacceptable	Total
Brown County	4,213	51	49	100
St. Joseph County	5,782	46	55	100

Because enrollees constitute a self-selected sample of poor households, their housing is not representative of all dwellings in a site. Since eligibility depends in principle on the inability to afford adequate housing, it is surprising that about half of all enrollees, despite their low income, were living in acceptable dwellings.

Types of Defects

Table 2.1 groups the 37 itemized housing defects into ten clusters of related defects. The table shows how many defects of each type were reported for the 2,073 dwellings in Brown County and the 3,148 dwellings in St. Joseph County that failed their initial evaluations. The most striking finding is the large number of hazardous stairs or railings. Exterior and interior stairway hazards together account for about a third of all the defects reported in each site. Because only the overall stairway rating is transcribed from evaluators' reports to machine-readable records, we cannot distinguish between such defects as broken treads, loose carpeting, or missing handrails; but evaluation supervisors and repair records both indicate that handrails are implicated in most stairway failures.*

The other prominent defects are inadequate bathroom facilities; hazardous conditions in the wiring, plumbing, or heating system; and too few habitable rooms for the enrollee's household. The bathroom defects usually concern the condition of the plumbing, flooring, or ventilation rather than the absence of basic equipment. Utility system defects may require substantial work to correct or may entail only minor repairs or even merely resumption of a disconnected service.

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*The HAO requires a securely mounted handrail on any stairway with six or more steps. Many interior stairways (especially in single-family houses) lack handrails, but they are inexpensive to install. The average out-of-pocket cost for materials is about $10; when paid labor is used, the total cost is about $18.

Table 2.1

DEFECTS REPORTED ON INITIAL EVALUATIONS

Defect	Brown County		St. Joseph County	
	Number	Percent	Number	Percent
Inadequate Living Space				
Too few habitable rooms or bedrooms	708	17.3	951	14.0
Inadequate Facilities				
Kitchen[a]	117	4.3	484	7.1
Bathroom[b]	453	11.0	862	12.7
Hazardous Conditions				
Exterior property area (4 items)	130	3.2	138	2.1
Building exterior:				
Stairs, porches, and railings	262	6.4	177	2.6
Windows	349	8.5	887	13.0
Other (4 items)	155	3.8	262	3.8
Building interior:				
Stairs and railings	1,128	27.5	1,911	28.1
Other (7 items)	278	6.8	517	7.6
Utility systems (4 items)	461	11.2	614	9.0
All defects	4,101	100.0	6,803	100.0

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: The number of failure ratings exceeds the number of initial evaluations because some preenrollment dwellings had more than one defect.

[a]Any combination of the 7 kitchen items was tallied as one defect.

[b]Any combination of the 8 bathroom items was tallied as one defect.

A shortage of habitable space is especially serious because it may not be correctable without major remodeling. Often, however, the required number of rooms exists, but one is rated uninhabitable for lack of heating, ventilation, natural or artificial light, or privacy; minor remodeling may make such a room habitable.

Defects per Dwelling

A general defect sometimes results in several item failures. The various itemized defects are not equally serious, and the repair costs for correcting the same defect in different dwellings may vary considerably. Nonetheless, the average number of reported defects is an approximate measure of housing quality that is comparable across sites and between classes of enrollees.

As shown below, enrollees in St. Joseph County had slightly worse housing than those in Brown County:

	Average Defects per Dwelling	
	Unacceptable Dwellings	All Evaluated Dwellings
Brown County	2.03	1.00
St. Joseph County	2.16	1.18

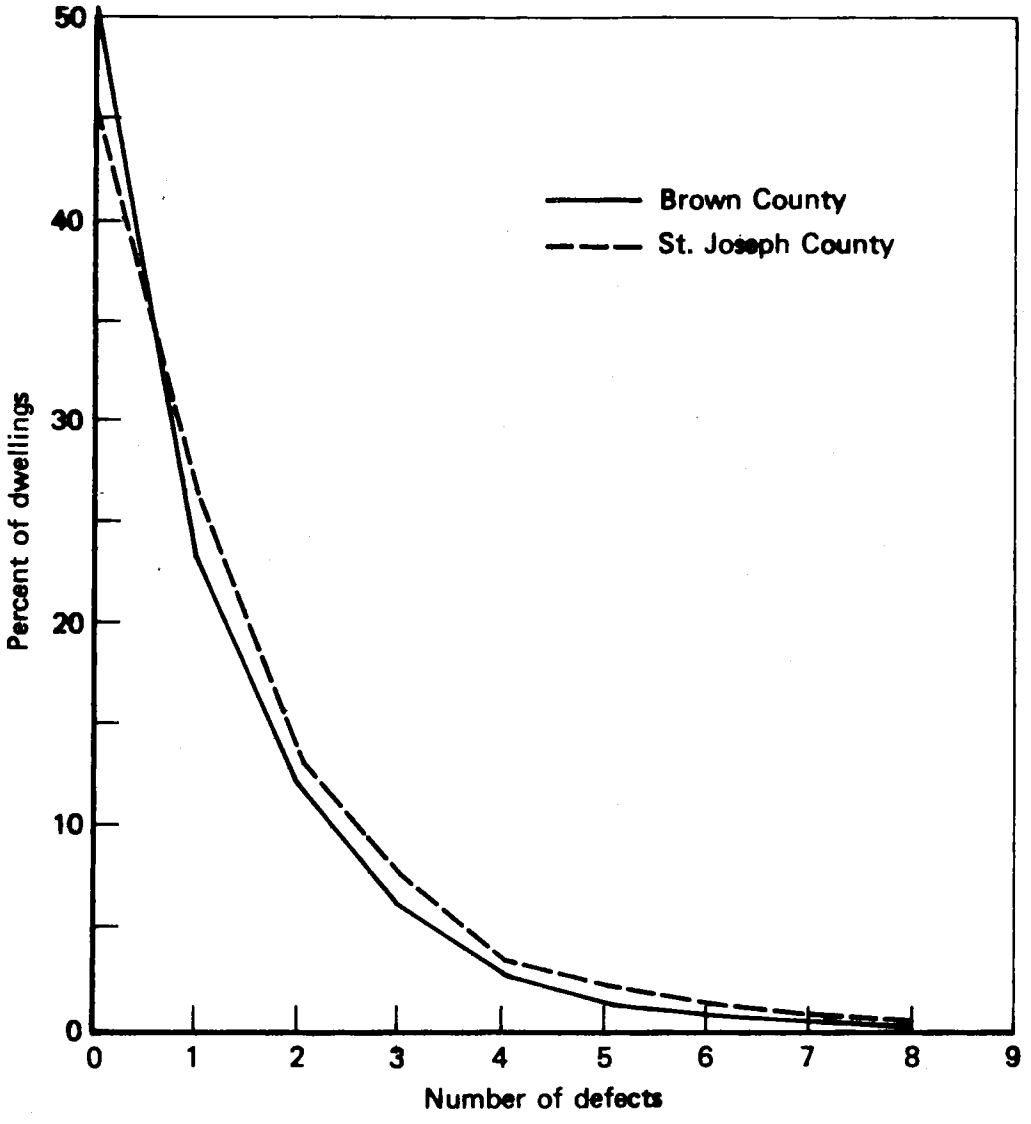
Frequency distributions for both sites are shown in Fig. 3. St. Joseph County has relatively fewer dwellings with no defects and more with three or more defects, but the overall patterns are similar. About 95 percent of all evaluated dwellings had fewer than four defects, but the range extends up to 17.

Household Size

Table 2.2 shows that the evaluation failure rate rises sharply with the number of persons in the enrollee's household. The dwellings of large households often fail because of overcrowding, whereas such failures are rare for households of one or two persons. But other defects are also more common in the homes of large families.

Age and Race

In both sites, elderly and white enrollees tend to live in better homes than do their opposites (see Table 2.3). The finding reflects in part characteristic differences in household size between the elderly and the nonelderly and between whites and nonwhites, hence differences



SOURCE: HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

Fig. 3 — Number of defects per evaluated dwelling (initial evaluations)

Table 2.2

INITIAL EVALUATION RESULTS BY HOUSEHOLD SIZE

Persons per Household	Number of Cases	Evaluation Result (%)		
		Acceptable	Unacceptable	Total
Brown County				
1	1,139	61	39	100
2	1,071	57	43	100
3	868	48	52	100
4-5	791	44	56	100
6+	341	20	80	100
All cases[a]	4,210	51	49	100
St. Joseph County				
1	1,690	50	50	100
2	1,537	52	48	100
3	1,058	45	55	100
4-5	1,090	39	61	100
6+	401	23	77	100
All cases[a]	5,776	46	54	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

[a]Includes cases for which household size was not reported.

in the incidence of overcrowding; but Fig. 4 shows that the housing of nonelderly and nonwhite enrollees is also more often defective in other respects.

Tenure and Monthly Housing Expense

Table 2.4 shows evaluation results by tenure and monthly housing expense. We were surprised that the failure rates for renters and owners are not very different, especially in Brown County. In both sites and for both renters and owners, the failure rate generally drops as housing expense rises.

As recorded by the HAOs, a renter's housing expense comprises his contract rent and a standard allowance for each utility he pays

Table 2.3

INITIAL EVALUATION RESULTS BY AGE AND RACE OF HOUSEHOLD HEAD

Characteristic of Head	Number of Cases	Evaluation Result (%)		
		Acceptable	Unacceptable	Total
Brown County				
Age				
62+ years	1,355	61	39	100
Under 62	2,857	46	54	100
All ages[a]	4,213	51	49	100
Race				
White	4,061	51	49	100
Black	6	(c)	(c)	(c)
Other	143	33	67	100
All races[b]	4,213	51	49	100
St. Joseph County				
Age				
62+ years	2,192	52	48	100
Under 62	3,588	42	58	100
All ages[a]	5,782	46	54	100
Race				
White	4,117	49	51	100
Black	1,544	38	62	100
Other	115	25	75	100
All races[b]	5,782	46	54	100

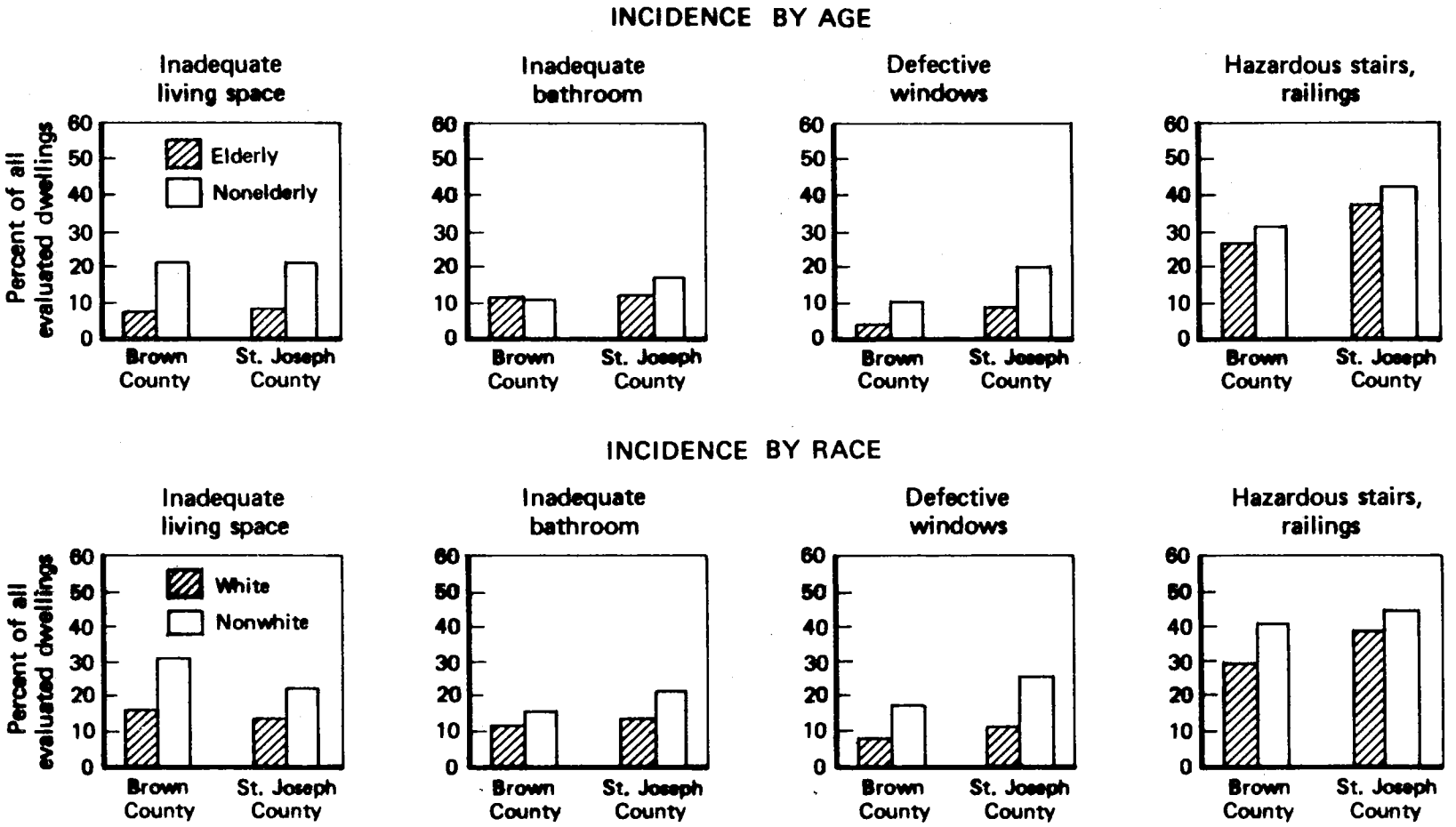
SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

[a]Includes cases for which age of head was not reported.

[b]Includes cases for which race of head was not reported.

[c]Not calculated because sample is too small.

directly. The sum of those items, usually called gross rent, is a fairly reliable estimate of a tenant's housing expense. For homeowners, the HAOs add mortgage interest payments, real estate taxes, insurance, and standard allowances for maintenance and utilities to arrive at monthly housing expense. Forgone earnings on the equity in a property are not counted.



SOURCE: HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

Fig. 4 — Incidence of selected housing defects by age and race of household head (initial evaluations)

Table 2.4

INITIAL EVALUATION RESULTS BY TENURE AND MONTHLY HOUSING EXPENSE

Monthly Housing Expense[a] ($)	Number of Cases	Evaluation Result (%)		
		Acceptable	Unacceptable	Total
Brown County				
Renters				
Under 100	346	44	56	100
100-149	877	45	55	100
150-199	894	58	42	100
200 or more	265	65	35	100
All renters	2,382	52	48	100
Owners				
Under 100	741	50	50	100
100-149	466	43	57	100
150-199	308	46	54	100
200 or more	264	66	34	100
All owners	1,779	50	50	100
St. Joseph County				
Renters				
Under 100	373	36	64	100
100-149	1,006	40	60	100
150-199	748	42	58	100
200 or more	334	48	51	100
All renters	2,461	41	59	100
Owners				
Under 100	1,784	49	51	100
100-149	875	46	54	100
150-199	405	50	50	100
200 or more	167	64	36	100
All owners	3,231	49	51	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Tenure or housing expense information was not reported for 52 cases in Brown County and 40 in St. Joseph County.

[a]See accompanying text for items included. Homeowners' expenses are understated.

The exclusion of forgone earnings on equity is important because those earnings can easily account for a third of true housing expense for an unmortgaged property.* More than 70 percent of the owners reporting housing expenses of less than $100 were elderly persons, and most of them owned their homes free and clear. The failure rate for those owners is lower than for those whose expenses exceed $200. A complete accounting of homeowners' housing expenses would undoubtedly lead to a monotonic decrease in the failure rate as housing expense increased.

SUMMARY

About half of all preenrollment dwellings in each site failed their initial evaluations; housing evaluators reported between one and 17 defects per failed dwelling, and about two defects on the average. The most common defects were stairways lacking handrails, too few habitable rooms, inadequate bathrooms, and unsafe utility systems.

The enrollees whose dwellings most often failed had large households, were nonelderly or nonwhite, or lived in inexpensive homes. Failure rates for renters and owners were similar overall.

*See Lawrence Helbers, *Measuring Homeowner Needs for Housing Assistance*, The Rand Corporation, WN-9079-HUD, February 1978.

not true in St. Joseph County.
Also not necessarily in terms of # of failures

III. DECISIONS FOLLOWING INITIAL EVALUATION

An enrollee whose dwelling passes its initial evaluation must choose between three courses that differently affect his program status: stay in the approved dwelling, move to another, or terminate enrollment. In the first case, the HAO will authorize monthly allowance payments as soon as certification formalities are complete.* In the second case, the enrollee must request an evaluation of his new home if he is to qualify for payments. In the third case, he forgoes further opportunities to qualify for payments.

An enrollee whose dwelling fails must also choose between three actions: He may repair the defective dwelling and request its reevaluation, he may move, or he may terminate his enrollment. In the first case, if the reevaluated dwelling is acceptable, certification and payment authorization will follow. The effects of the last two choices are as described above.

There is a sense in which the enrollee whose dwelling fails has a fourth choice: He may continue living in the failed dwelling without undertaking repairs and therefore without qualifying for payments, but also without terminating his enrollment. In this analysis, we treat that outcome as a postponement of decision. In time, nearly all enrollees decide on one of the first three actions.**

This section reports on clients' decisions following initial evaluations, first for those whose dwellings passed, then for those whose dwellings failed. We examine decisions by type, time required to reach them, and (for decisions pursuant to evaluation failures) associated housing and client characteristics.

OCCUPANTS OF ACCEPTABLE DWELLINGS

Not surprisingly, nearly all those whose dwellings passed the

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*To complete certification, a renter must submit a lease agreement signed by his landlord. There are no further requirements for homeowners.

**In the decision trees (Figs. 1 and 2), those who have passed a housing evaluation point but have not reached a subsequent decision are enumerated in parentheses.

initial evaluation stayed in residence long enough to receive at least one allowance payment. The table below summarizes their first postevaluation decision:

	Brown County		St. Joseph County	
	Number	Percent	Number	Percent
Stay	2,019	94	2,444	93
Move	44	2	65	2
Terminate	39	2	66	2
Decision pending	38	2	59	2
Total	2,140	100	2,634	100

About 2 percent in each site moved before payments were authorized. Some were unable to obtain leases from their landlords; others were dissatisfied with their homes even though they met HAO standards. Another 2 percent terminated enrollment, being unable to obtain a lease and unwilling to move, or changing their minds about participating in the program. At the close of file, a few recent enrollees had completed their housing evaluations but were awaiting payment authorizations; their cases are classified as "decision pending."

Time Between Decisions

Enrollees who stayed in acceptable dwellings were promptly authorized for payments. Over 80 percent were authorized within a month after the initial evaluation request and over 95 percent within two months. The interval was occupied by evaluation scheduling and administrative formalities. Renters sometimes delayed the proceedings by failing to file the necessary lease, especially the few who planned to move or terminate.

For those who moved, the average interval between the initial and the premove or postmove evaluation request was about two months. Those who terminated usually did so by failing to respond to the semiannual recertification form sent to them six months after they enrolled.

Factors Affecting Decisions

Because nearly all those whose preenrollment dwellings were

acceptable stayed there, little could be learned by comparing them with those who moved or terminated. That topic is therefore explored only for those whose preenrollment dwellings failed the initial evaluation (see below).

OCCUPANTS OF UNACCEPTABLE DWELLINGS

The table below summarizes the subsequent decisions of enrollees whose preenrollment dwellings were evaluated and found unacceptable:

	Brown County		St. Joseph County	
	Number	Percent	Number	Percent
Repair	1,275	62	1,882	60
Move	208	10	233	7
Terminate	402	19	627	20
Decision pending	188	9	406	13
Total	2,073	100	3,148	100

The distributions are remarkably similar in the two sites. About three-fifths chose to repair their preenrollment dwellings and one-fifth to terminate. Moves were more common in Brown County, pending decisions more common in St. Joseph County. The difference probably reflects the fact that the St. Joseph County file contains relatively more records for recent enrollees than the Brown County file.

Time Between Decisions

We measured the elapsed time between each enrollee's initial evaluation request and the indicator of his first subsequent decision. For one who repaired his unacceptable dwelling, the indicator was a request for reevaluation. For one who moved, the indicator was a request for evaluation of the new dwelling.* For one who neither repaired nor moved but who terminated his enrollment before close of file, the termination action was the decision indicator.

*We counted either a premove or a postmove evaluation request for that dwelling, but did not count premove evaluation requests for dwellings not subsequently occupied by the client.

The distributions of cases by elapsed time between decisions are shown in Fig. 5. Those who repaired their unacceptable dwellings usually acted promptly; about 80 percent requested reevaluations within two months of their initial evaluation requests. Movers acted more slowly; an elapsed time of more than five months encompasses 80 percent of the cases. Nearly all terminees waited until the semiannual recertification to definitely leave the program; they often simply did not respond to the recertification form.

Only one client characteristic--adjusted gross income--is strongly correlated with decision time. As shown below, those with lower incomes acted more quickly, suggesting that they were more anxious to qualify for payments:

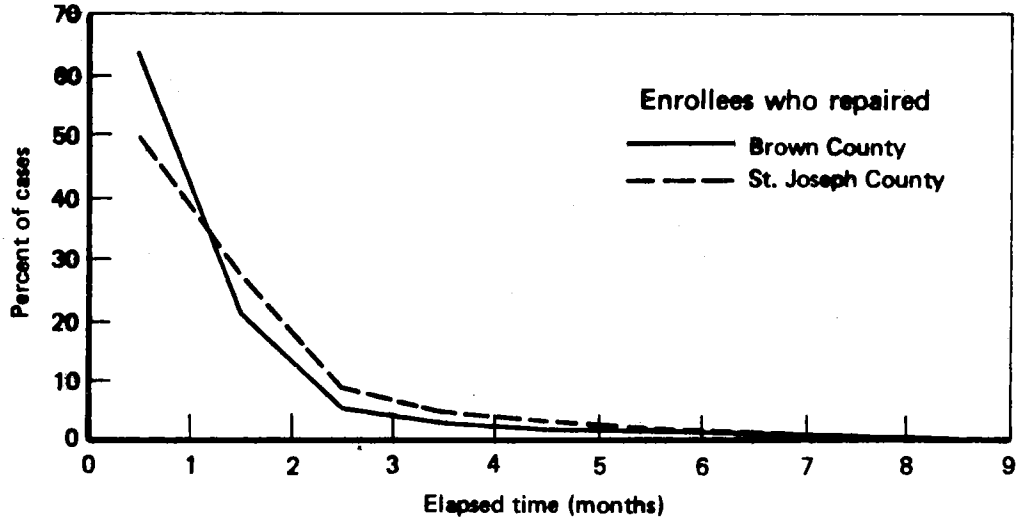
	Average Time Between Decisions (months)	
	Brown County	St. Joseph County
Gross income under $4,000	1.98	2.53
Gross income $4,000 or more	2.81	3.21

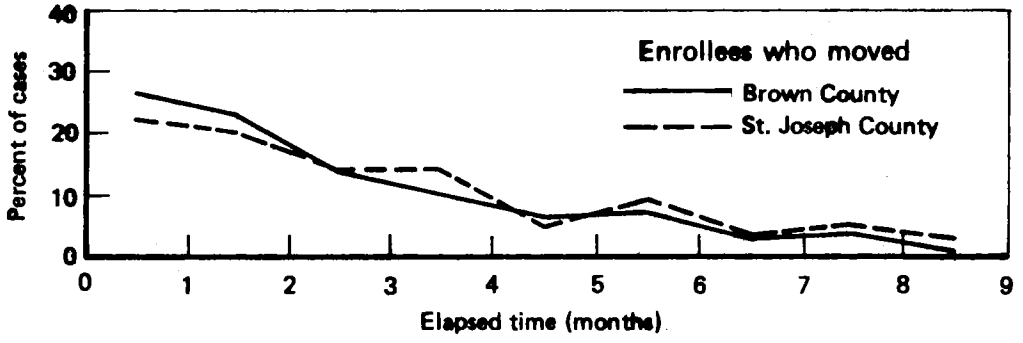
Decision times were also longer in St. Joseph than in Brown County.

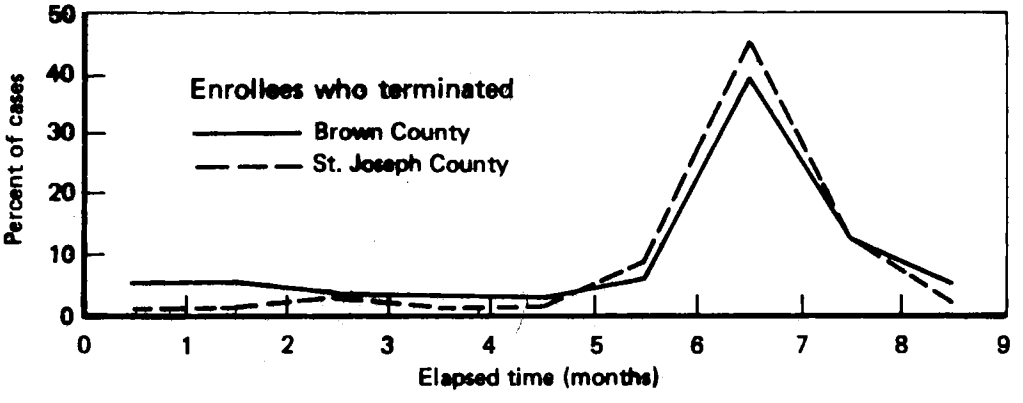
The results of the initial evaluation also reflect in decision time: The more defects reported, the more time clients took to act. In Brown County, for example, the average decision time for those whose dwellings had only one defect was 1.91 months; for two defects, 2.46 months; and for three defects, 2.85 months. Moreover, among those who attempted repairs, prompt action and successful repairs went together. Those whose dwellings were acceptable after reevaluation averaged 1.23 months in Brown County and 1.59 months in St. Joseph County between initial evaluation and reevaluation requests. In both counties, those whose reevaluated dwellings were still unacceptable averaged about 2.83 months between requests.

Factors Affecting Decisions

Among those whose dwellings failed the initial evaluation, subsequent actions varied with the characteristics of both dwelling and occupant. Below, we summarize the salient patterns in the data.







SOURCE: HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

Fig. 5 — Elapsed time between initial evaluation request and first postevaluation decision for enrollees failing initial evaluations

Number of Housing Defects. Table 3.1 shows that enrollees were reluctant to repair seriously substandard dwellings. As the number of defects increases, the percentage of occupants repairing their dwellings drops sharply and the percentage either moving or terminating rises.

It appears that the expectation of allowance payments was an adequate incentive to repair at least three-fourths of the dwellings

Table 3.1

FIRST DECISION FOLLOWING INITIAL EVALUATION FAILURE BY NUMBER OF HOUSING DEFECTS REPORTED

Disaggregate by tenure

Number of Defects	Number of Cases	Client Decision (%)			
		Repair	Move	Terminate	Total
Brown County					
1	973	76	9	15	100
2	493	69	9	22	100
3	237	56	12	32	100
4+	202	38	23	39	100
All cases[a]	1,885[a]	68	11	21	100
St. Joseph County					
1	1,376	82	5	14	100
2	620	67	8	25	100
3	343	59	10	31	100
4+	397	36	20	44	100
All cases[a]	2,742[a]	69	8	23	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries pertain to enrollees whose preenrollment dwellings failed their initial evaluations and who had repaired those dwellings, moved, or terminated their enrollments before the close of file. Records for 188 clients in Brown County and 406 in St. Joseph County were excluded because no postevaluation action was reported.

Percentage distributions may not add exactly to 100 because of rounding.

[a]Includes cases for which number of defects was not reported.

that were just below HAO standards and more than a third of the worst dwellings. By either repairing or moving, about 86 percent of those in slightly substandard dwellings qualified for payments, as against 60 percent of those in the worst housing. Even though the program appears to "cream" those in better housing, it helps a majority in the worst housing.

More detailed analysis of the types of defects did not reveal any good predictors of an enrollee's response. It appears to be the number of defects rather than their type that influences postevaluation decisions.

Tenure and Age of Head. Table 3.2 shows that homeowners are more likely than renters to repair unacceptable dwellings and less likely to move. Controlling on age of head, about the same percentages of owners and renters terminated without qualifying for payments.

We were not surprised that owners rarely moved from their unacceptable dwellings, given that a move would usually necessitate selling the home. However, it is interesting that this obstacle to moving is reflected not in a higher termination rate for owners but in a higher repair rate than for renters.

In both sites, the elderly are most likely to repair and least likely either to move or to terminate. Only a bare majority of renters under 62 repaired their unacceptable dwellings, and about a fourth terminated their enrollments.

We should note that the number of housing defects is related to both tenure and age of head and may partly explain the response patterns noted above. For example, in St. Joseph County, renters' dwellings averaged 2.35 defects vs. 1.86 for owners'. The dwellings of households headed by persons under 30 years of age averaged 2.35 defects, vs. 1.72 for those of persons 62 years or older. The pattern is the same in Brown County, though the differences are smaller.

Household Size. Table 3.3 shows how household size affects postevaluation decisions. The proportion of enrollees who repair unacceptable dwellings declines with household size, and the proportion who terminate increases. Moving is most common among medium-sized households. We think the decreasing propensity to repair as household size

Table 3.2

FIRST DECISION FOLLOWING INITIAL EVALUATION FAILURE BY HOUSING TENURE AND AGE OF HEAD

Tenure and Age of Head	Number of Cases	Client Decision (%)			
		Repair	Move	Terminate	Total
Brown County					
Renters					
62+ years	171	71	12	18	100
Under 62 years	862	57	19	23	100
All ages	1,033	60	18	22	100
Owners					
62+ years	305	85	(a)	15	100
Under 62 years	519	76	1	23	100
All ages	824	79	1	20	100
St. Joseph County					
Renters					
62+ years	181	80	6	14	100
Under 62 years	1,062	55	18	27	100
All ages	1,243	58	16	26	100
Owners					
62+ years	747	86	(a)	13	100
Under 62 years	709	71	1	28	100
All ages	1,456	79	1	20	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries pertain to enrollees whose preenrollment dwellings failed their initial evaluations and who had repaired those dwellings, moved, or terminated their enrollments before the close of file. Records for 188 clients in Brown County and 406 in St. Joseph County were excluded because no posteval-uation action was reported. Another 28 in Brown County and 43 in St. Joseph County are excluded because either tenure or age of head was not reported.

Percentage distributions may not add exactly to 100 because of rounding.

[a]Less than 0.5 percent.

Table 3.3

FIRST DECISION FOLLOWING INITIAL EVALUATION FAILURE BY SIZE OF HOUSEHOLD

Number of Persons per Household	Number of Cases	Client Decision (%)			
		Repair	Move	Terminate	Total
Brown County					
1	397	77	8	15	100
2	424	72	11	17	100
3	415	60	19	21	100
4-5	397	68	8	24	100
6+	252	59	6	35	100
All sizes	1,885	68	11	21	100
St. Joseph County					
1	750	84	3	13	100
2	646	72	9	19	100
3	501	61	15	24	100
4-5	573	59	11	30	100
6+	272	53	6	41	100
All sizes	2,742	69	8	23	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries pertain to enrollees whose preenrollment dwellings failed their initial evaluations and who had repaired those dwellings, moved, or terminated their enrollments before the close of file. Records for 188 clients in Brown County and 406 in St. Joseph County were excluded because no postevaluation action was reported.

increases actually reflects the larger effort needed to repair the homes of larger families. As shown below, the number of housing defects is positively correlated with the number of persons in a household:

	Average Defects	
	Brown County	St. Joseph County
1 person	1.65	1.73
2 persons	1.78	1.94
3 persons	1.97	2.22
4-5 persons	1.91	2.26
6+ persons	2.62	2.89

Medium-sized households are most likely to move because most are young renters for whom moving is comparatively easy. In St. Joseph County, 60 percent of the three-member households whose dwellings failed were renters, while the average age of heads of three-member households was 33.4 years. Most of the movers had at least one child under 18 in their households.

Monthly Allowance Entitlement. Enrollees who are entitled to larger allowances presumably have greater incentives to remedy unacceptable housing conditions. However, they are also likely to have more housing defects. In Brown County, enrollees in failed dwellings who were entitled to less than $30 monthly averaged 1.72 defects, as compared with 2.14 for those whose monthly entitlement was over $90. In St. Joseph County, the corresponding groups averaged 1.62 and 2.45 defects. Those entitled to large allowances also tended to be renters and to be younger than those entitled to small allowances. As we have seen, young renters in unacceptable dwellings often move rather than repair.

Table 3.4 shows how decisions following evaluation failures vary with amount of entitlement. The percentage repairing unacceptable dwellings first rises then declines as entitlement increases. The percentage moving rises consistently. The percentage terminating first declines, then rises. Because of the noted intercorrelations between entitlement, housing characteristics, and household characteristics, the results are not easy to interpret. However, it is clear that a simple incentive model of behavior would not explain the decision pattern.

Looking for Alternatives

If the repairs required on an unacceptable dwelling seemed excessive compared with prospective allowance benefits, or if a renter's landlord was unwilling to cooperate in making or paying for repairs, one might expect the enrollee to consider moving to an acceptable dwelling. To learn whether a move would produce the desired result--an acceptable dwelling--the enrollee could request premove evaluations on any number of dwellings. The number of such evaluations

Table 3.4

FIRST DECISION FOLLOWING INITIAL EVALUATION FAILURE BY AMOUNT OF ALLOWANCE ENTITLEMENT

Monthly Entitlement ($)	Number of Cases	Client Decision (%)			
		Repair	Move	Terminate	Total
Brown County					
10-30	275	57	6	36	100
31-50	433	70	9	21	100
51-70	420	74	10	16	100
71-90	346	66	15	19	100
91+	402	68	15	17	100
All amounts[a]	1,885	68	11	21	100
St. Joseph County					
10-30	351	66	2	32	100
31-50	609	76	4	20	100
51-70	571	77	5	18	100
71-90	316	72	10	18	100
91+	890	58	16	26	100
All amounts[a]	2,742	69	8	23	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries pertain to enrollees whose preenrollment dwellings failed their initial evaluations and who had repaired those dwellings, moved, or terminated their enrollments before the close of file. Records for 188 clients in Brown County and 406 in St. Joseph County were excluded because no postevaluation action was reported.

Percentage distributions may not add exactly to 100 because of rounding.

[a]Includes cases for which monthly allowance entitlement was not reported.

actually requested is an indicator of the seriousness with which enrollees explored alternatives to repairing their dwellings' defects.

Table 3.5 summarizes the evidence: Those who ended by repairing their preenrollment residences rarely looked seriously enough at alternatives to request premove evaluations. Those who ended by moving of course had their new homes evaluated, but no more than 10

Table 3.5

EVALUATIONS OF ALTERNATIVE DWELLINGS FOLLOWING INITIAL EVALUATION FAILURE BY CLIENT ACTION

Client Action and Subsequent Evaluation Result	Number of Dwellings Evaluated per 100 Clients	
	Brown County	St. Joseph County
Repair		
Repaired dwelling acceptable	.2	.3
Repaired dwelling unacceptable	--	1.2
Move		
New dwelling acceptable	110.7	125.0
New dwelling not acceptable	108.1	112.4
Terminate		
All terminees	3.5	5.4

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries are based on the number of premove or post-move evaluations requested by clients whose preenrollment residences failed their initial evaluations.

percent in Brown County and roughly 20 percent in St. Joseph County called for evaluations of more than one dwelling. However, in St. Joseph County, those who found new homes that were acceptable without repair looked at more alternatives than those who had to repair their newly chosen residences.

The most striking finding is that those who terminated without ever qualifying for payments rarely considered alternatives to their unacceptable preenrollment dwellings. Premove evaluations were requested by at most 3.5 percent of that group in Brown County and 5.4 percent in St. Joseph County.

SUMMARY

About 95 percent of the enrollees whose dwellings were initially acceptable to the HAO stayed in those dwellings and in due course received allowance payments. Only a few moved or terminated before

qualifying for payments. That outcome is unsurprising. Those in acceptable dwellings qualified for payments without effort; and though their benefits might have induced them to consider voluntarily making home improvements or moving to better homes, those decisions need not be hurried if payments were coming anyway.

The behavior of those in unacceptable dwellings was more diverse. About two-thirds repaired, a tenth moved, and over a fifth terminated their enrollments without ever qualifying for payments. The repairers usually acted within a month or two; the movers took longer, but seldom more than five months; the terminees usually dropped out when their first semiannual certification was due.

In general, the worst dwellings were least likely to be repaired, their occupants usually moving or terminating. Homeowners--for whom moving is difficult--were more likely to repair than renters and less likely to move. Controlling on tenure, the elderly were more likely to repair and less likely to move than younger households. Controlling on age of head, owners and renters were equally likely to terminate rather than repair or move.

The number of housing defects, household size, and allowance entitlement interact to influence decisions. Larger households live in worse dwellings but have larger entitlements and therefore greater incentives to qualify for payments. As household size increases, the percentage repairing unacceptable dwellings drops sharply and the percentage terminating increases; medium-sized households are the most likely to move. Allowance entitlement also seems to affect decisions, but not in a simple way. The data strongly imply that a multivariate behavioral model will be needed to sort out the influences of each factor.

Data on clients' requests for evaluations of other dwellings suggest that occupants of unacceptable dwellings decided on their next actions (repair, move, or terminate) without much exploration of alternatives.

IV. PATHS TO FIRST CERTIFICATION

The preceding section described enrollees' decisions following the initial housing evaluation. Those decisions can be viewed as tactics in a game whose prize is the receipt of allowance payments. Based on the information they obtained from their initial evaluations, some enrollees apparently decided that the prize was unattainable or not worth the effort, so dropped out of the game. Others learned they could win without further effort, by simply staying in dwellings the HAO found acceptable. In between were those who learned that to stay in the game they would be required to repair their preenrollment dwellings or move. Neither of the last alternatives led certainly to the prize; a repaired dwelling might fail reevaluation, and a mover might find that his new home was also unacceptable.*

This section distinguishes those who achieved certification of some dwelling (and consequently received allowance payments) from those who did not. For each group, we trace the steps they took en route to either first certification, termination of enrollment, or the close of file, whichever came first. Then we show how the outcomes relate to client characteristics.

ACHIEVING FIRST CERTIFICATION

During the two years covered by our data, 83 percent of the enrollees in Brown County and 78 percent in St. Joseph County achieved certification of at least one dwelling. Table 4.1 shows how many enrollees followed each of the main paths to that result.

In each site, about three-fourths of all enrollees obtained certification of their preenrollment dwellings and about 5 percent first succeeded with some other dwelling.** Of all first-certified

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*However, those who repair unacceptable dwellings are not limited to a single reevaluation, and those who plan to move are encouraged to request a premove evaluation rather than commit themselves to the chosen dwelling before it is evaluated.

**We remind the reader that these data understate moves because the housing decision trees exclude 317 enrollees in Brown County and

Table 4.1

DISTRIBUTION OF ENROLLEES BY PATH TO FIRST CERTIFICATION

Path to First Certification	Brown County		St. Joseph County	
	Number of Cases	Percent of Total	Number of Cases	Percent of Total
Preenrollment dwelling:				
Certified without repair	2,019	47.9	2,444	42.3
Certified after repair	1,228	29.1	1,814	31.4
Another dwelling:				
Certified without repair	157	3.7	153	2.6
Certified after repair	76	1.8	118	2.0
Never achieved certification:				
Terminated enrollment	466	11.1	750	13.0
Still enrolled[a]	267	6.3	503	8.7
All cases	4,213	100.0	5,782	100.0

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Certification paths do not include all intermediate actions. For example, an enrollee may have unsuccessfully repaired his preenrollment dwelling, then moved twice before achieving first certification in another dwelling.

Percentage distributions may not add exactly to 100 because of rounding.

[a]Still enrolled at the close of file.

dwellings, nearly 38 percent in Brown County and 43 percent in St. Joseph County were repaired before certification was granted. Moving was not a good way to avoid repairing a dwelling; precertification repairs were almost equally common for dwellings to which enrollees moved as for preenrollment dwellings.

At the close of file, 11 percent of the enrollees in Brown County and 13 percent in St. Joseph County had terminated their enrollments

677 in St. Joseph County who moved from their preenrollment units before they could be evaluated, or who moved from public to private housing after enrolling (see Table 1.1). Not all those enrollees achieved certification, but tabulations that include them indicate that 8 to 9 percent of all enrollees moved between enrollment and first certification. See *Fourth Annual Report of the Housing Assistance Supply Experiment*, The Rand Corporation, R-2302-HUD, May 1978, Table 4.7, p. 65, for one such tabulation.

without ever achieving certification. Another 6 and 9 percent, respectively, had not yet achieved certification but were still enrolled. Of the latter category, 70 percent in Brown County and 80 percent in St. Joseph County lived in homes that had failed the initial evaluation; but they had yet to make their first postevaluation decision. Most of the others were in acceptable dwellings but were awaiting completion of certification formalities.

EFFECTIVENESS OF CERTIFICATION TACTICS

Following the initial evaluation of his preenrollment dwelling, an enrollee must decide which tactic to follow toward certification. As noted earlier, the outcomes of the alternatives are often uncertain. Table 4.2 shows the consequences of each of the several possible first postevaluation decisions.

Table 4.2

OUTCOME OF EFFORTS TO ACHIEVE CERTIFICATION BY INITIAL EVALUATION RESULT AND FIRST POSTEVALUATION DECISION

Initial Evaluation Result and First Postevaluation Decision	Number of Cases	Outcome (%)			
		Achieved Certification	Never Achieved Certification		Total
			Terminated	Still Enrolled[a]	
Brown County					
Acceptable dwelling:					
Stay without repair	2,096	96	2	2	100
Move to another dwelling	44	90	--	10	100
Unacceptable dwelling:					
Stay without repair	590	--	68	32	100
Stay and repair	1,275	97	1	2	100
Move to another dwelling	208	90	7	3	100
St. Joseph County					
Acceptable dwelling:					
Stay without repair	2,569	95	3	2	100
Move to another dwelling	65	92	6	2	100
Unacceptable dwelling:					
Stay without repair	1,033	--	61	39	100
Stay and repair	1,882	97	2	1	100
Move to another dwelling	233	89	6	5	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Certification paths do not include all intermediate actions. For example, an enrollee may have unsuccessfully repaired his preenrollment dwelling, then moved twice before achieving first certification in another dwelling.

[a]Still enrolled at the close of file.

For those in an initially acceptable dwelling, staying seems to be a more reliable tactic than moving, inasmuch as a new residence may not be acceptable. For those in an initially unacceptable dwelling, staying and repairing it also seems a more reliable tactic than moving. Of course, staying but not repairing guarantees that the client will never achieve certification. We should note in any case that the different certification success rates for stayers and movers could reflect sound judgment rather than miscalculations. For example, those who moved from unacceptable dwellings may have judged correctly that the defects were irreparable, whereas moving offered them a chance to achieve certification.

Another way to measure the effectiveness of certification tactics is by the number of *housing actions*--either repairing a dwelling or moving--required to achieve certification. Table 4.3 groups enrollees who eventually achieved certification by their initial evaluation results and first postevaluation decisions, then distributes those in each group by number of housing actions en route to first certification.

Those whose preenrollment dwellings were initially acceptable and who stayed in them achieved first certification without *any* housing actions. Those in unacceptable dwellings who stayed and repaired rarely had to take a second action (repair a second time because the first repairs did not satisfy the HAO, or move after a reevaluation failure). But nearly a third of those in Brown County and nearly half in St. Joseph County whose first postevaluation decision was to move took at least one additional action (repair the new home, or move again) to achieve first certification. Whether the move was from an acceptable or an unacceptable dwelling only slightly affected the number of subsequent housing actions.

Table 4.4 presents similar information about those who failed to achieve first certification. Whether they had terminated or were still enrolled at the close of file, the striking fact is that few tried very hard to achieve certification. Thus, among the 680 enrollees in St. Joseph County whose dwellings were initially unacceptable and who terminated their enrollments, 627 (92 percent) did so without taking any action that might lead to certification. Likewise, among the

Table 4.3

NUMBER OF HOUSING ACTIONS PRIOR TO FIRST CERTIFICATION BY INITIAL EVALUATION RESULT AND FIRST POSTEVALUATION DECISION

Initial Evaluation Result and First Post-evaluation Decision	Number of Cases	Distribution of Cases by Number of Actions Prior to First Certification					Average Number of Actions
		0	1	2	3	4	
Brown County							
Acceptable dwelling:							
Stay without repair	2,019	2,019	--	--	--	--	--
Move to another dwelling	40	--	28	12	--	--	1.30
Unacceptable dwelling:							
Stay and repair	1,234	--	1,211	22	1	--	1.02
Move to another dwelling	187	--	121	62	4	--	1.37
St. Joseph County							
Acceptable dwelling:							
Stay without repair	2,444	2,444	--	--	--	--	--
Move to another dwelling	60	--	31	24	5	--	1.57
Unacceptable dwelling:							
Stay and repair	1,818	--	1,765	48	4	1	1.03
Move to another dwelling	207	--	118	76	9	4	1.51

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: A housing action consists of either repairing a dwelling or moving. Moving to a new home, then repairing it counts as two actions. Repairing the same dwelling twice because the first repair did not result in an acceptable reevaluation also counts as two actions.

443 who were still enrolled at the close of file, 406 (again, 92 percent) had not acted in response to the initial evaluation failure.*

Given the larger samples that will be available from HAO records covering more years of program history, it may be possible to refine the above analysis to reflect the nature of the housing defects that set the stage for an enrollee's certification tactics. But the general message from the present sample is that enrollees who try to achieve housing certification nearly always succeed; and those who never achieve certification make little effort to do so. The most

*It is possible that some of the enrollees who never acted (according to our definition) made partial repairs but never requested reevaluations; or requested evaluations of other dwellings but never moved. However, Table 3.5 shows that no more than 4 percent in St. Joseph County requested evaluations of alternative dwellings.

Table 4.4

NUMBER OF HOUSING ACTIONS TAKEN BY ENROLLEES NEVER ACHIEVING CERTIFICATION BY INITIAL EVALUATION RESULT AND FINAL PROGRAM STATUS

Initial Evaluation Result and Final Program Status	Number of Cases	Distribution of Cases by Number of Actions Before Reaching Final Status				Average Number of Actions
		0	1	2	5	
Brown County						
Acceptable dwelling:						
Terminated enrollment	39	39	--	--	--	--
Still enrolled[a]	44	38	3	1	--	.11
Unacceptable dwelling:						
Terminated enrollment	427	402	25	--	--	.06
Still enrolled[a]	225	188	33	4	--	.18
St. Joseph County						
Acceptable dwelling:						
Terminated enrollment	70	66	3	1	--	.07
Still enrolled[a]	60	59	--	1	--	.03
Unacceptable dwelling:						
Terminated enrollment	680	627	41	12	--	.10
Still enrolled[a]	443	406	33	3	1	.10

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: A housing action consists of either repairing a dwelling or moving. Moving to a new home, then repairing it counts for two actions. Repairing the same dwelling twice because the first repair did not result in an acceptable reevaluation also counts as two actions.

[a]Still enrolled at the close of file.

plausible inference is that failure to achieve certification more often reflects inadequate incentives than serious obstacles.

HOUSEHOLD CHARACTERISTICS AFFECTING CERTIFICATION

The housing decision trees shown in Figs. 1 and 2 present the sequence of housing decisions facing those who enroll in the program. At each decision point, we suppose that an enrollee's choice is affected by a variety of factors, including (a) the characteristics of

his household, (b) the characteristics of his dwelling, (c) the last prior action by the HAO, (d) his perception of alternative housing opportunities, and (e) the history of his dealings with the HAO (which helps him forecast its response to his next action).

Here, we work with a reduced form of the decision tree, collapsing all the HAO's actions and all the enrollee's decisions prior to first certification or termination into a single event whose outcome is assumed to depend only on characteristics of the client's household. The validity of the reduced form is supported by the observation made earlier: Those who work toward certification nearly always achieve it, regardless of their initial housing conditions; whereas those who never achieve certification rarely try seriously to overcome their housing obstacles. That pattern suggests that household characteristics determine the *likelihood* of achieving certification, whereas housing characteristics are reflected in the *path* to certification. The data presented below support that inference.

Unless an enrollee's dwelling passes its initial evaluation, the final outcome of his efforts to achieve certification may not be known for some months.* We therefore restricted the analysis to households who enrolled in the program at least six months before the close of file. Excluding recent enrollees left 3,403 records for Brown County and 4,456 for St. Joseph County, nearly all of which were for households that had either achieved certification or terminated. Although the reduced file contains some records for households who had neither achieved certification nor terminated, we did not factor those cases out. Rather, we only divided the population into those who had achieved first certification and those who had not. The certification success rate is defined as the percentage of all households in a group that achieved first certification before the close of file.

Household Characteristics and Certification Success

Exploratory analysis identified a number of household characteristics that were directly or indirectly related to certification

*See Fig. 5, p. 26.

success: age of head, race of head, housing tenure, household size, adjusted gross income, and amount of allowance entitlement. Because those characteristics are correlated, not all are needed to explain certification outcomes. We used a logit model of certification success to select a parsimonious combination of variables that accounted well for intergroup variations in certification success rate.*

For Brown County, we found that cross-stratifying the enrolled population by age, tenure, and income yielded eight categories whose success rates ranged from 71 to 93 percent and for which each variable made a consistent contribution to certification success. The same grouping of cases for St. Joseph County yielded a wider range of success rates, 58 to 91 percent; further stratification by race was only marginally helpful in distinguishing success rates, so race is not included in the results below.

Table 4.5 shows the variation in success rates between the eight categories of enrollees. The rates are similar across sites for elderly enrollees, but are generally lower in St. Joseph County for nonelderly enrollees. Pairwise comparisons of entries in each column of the table diagnose the partial effects of age, tenure, and income. Controlling on age and tenure, success rates are consistently higher for those with low incomes. Controlling on age and income, the rates are consistently higher for owners. Finally, controlling on tenure and income, they are consistently higher for the elderly. Consequently, the highest success rate in each site is for elderly homeowners with incomes under $4,000; the least successful are nonelderly renters with incomes over $4,000.

Why should those variables control certification success? The significance of the income variable is clearest: Those with the lowest adjusted gross incomes tend to have larger allowance entitlements, so their incentive to achieve certification is stronger. The

*A success rate can be calculated only for a group of households whose membership is specified a priori. Using k dichotomous independent variables, the number of groups that can be defined by cross-stratification is 2^k; the more groups thus defined, the fewer cases in each. Consequently, choosing the "best" model of certification success is statistically complex. See Appendix B for details.

Table 4.5

EFFECTS OF SELECTED HOUSEHOLD CHARACTERISTICS ON HOUSING CERTIFICATION

Household Characteristics	Percent of Enrollees Who Achieved First Certification	
	Brown County	St. Joseph County
Elderly Head		
Renter, by income:		
Under $4,000	90	83
$4,000 or more	78	79
Owner, by income:		
Under $4,000	93	91
$4,000 or more	89	88
Nonelderly Head		
Renter, by income:		
Under $4,000	86	74
$4,000 or more	71	58
Owner, by income:		
Under $4,000	90	85
$4,000 or more	79	75
All cases	84	80

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries are based on data for 3,403 enrollees in Brown County and 4,456 in St. Joseph County who enrolled at least six months before the close of file. Elderly household heads are 62 or over. Income is annual adjusted gross income.

significance of the tenure variable is less clear. One might argue that homeowners have more control over their dwellings and so find it easier to correct HAO-reported deficiencies; but renters whose dwellings are unacceptable and whose landlords are uncooperative about repairs can move much more easily than homeowners faced with substantial repairs. As concerns age, the results seem perverse. Surely young people can more easily mobilize their resources to either repair or move than can the elderly, yet they less often achieve certification; perhaps they value the allowance less because they do not expect to be eligible very long.

However, the differences between groups should not be overstated. In both sites, nonelderly renters with incomes over $4,000 are outliers from the distribution of success rates. Rates for the remaining seven groups range only from 78 to 93 percent in Brown County and 74 to 91 percent in St. Joseph County.

Paths to Certification Success

The conundrums above are partly illuminated by Table 4.6, which shows the percentage of all enrollees in each group that achieved certification by a specified path. The row entries for each county approximately total the overall success rate shown in Table 4.5 for the same group.

Table 4.6

EFFECTS OF SELECTED HOUSEHOLD CHARACTERISTICS ON PATH TO FIRST CERTIFICATION

Household Characteristic	Percent of Enrollees Who Achieved First Certification by:[a]					
	Passing Initial Evaluation		Repairing After Initial Failure		Moving to Another Dwelling	
	Brown County	St. Joseph County	Brown County	St. Joseph County	Brown County	St. Joseph County
Elderly Head						
Renter, by income:						
Under $4,000	62	47	23	32	5	3
$4,000 or more	62	61	13	18	4	(b)
Owner, by income:						
Under $4,000	58	52	34	39	(b)	(b)
$4,000 or more	58	52	31	36	(b)	(b)
Nonelderly Head						
Renter, by income:						
Under $4,000	44	31	29	29	14	14
$4,000 or more	38	29	25	19	9	10
Owner, by income:						
Under $4,000	45	50	44	34	1	1
$4,000 or more	42	42	36	33	1	(b)
All cases	48	42	30	32	6	6

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries are based on data for 3,403 enrollees in Brown County and 4,456 in St. Joseph County who enrolled at least six months before the close of file. Elderly household heads are 62 or over. Income is annual adjusted gross income.

[a]Row entries for each county sum to the percentage of all enrollees who achieved first certification, differing from corresponding entries in Table 4.5 only because of rounding.

[b]Less than 0.5 percent.

Consider first those who succeeded without special effort--that is, by passing their initial housing evaluations. Except for nonelderly owners, enrollees in Brown County were more successful by that path than those in St. Joseph County. Both program and survey data indicate that housing in Brown County is generally newer and in better condition than housing in St. Joseph County; why the dwellings of nonelderly owners should be an exception is not clear.

Within each county, elderly households were more successful than the nonelderly in passing the initial evaluation, but the certification success rates do not vary consistently with either tenure or income. Certainly Brown County's homeowners do not enter the program with a certification advantage over renters of corresponding age and income; and in St. Joseph County, the advantage is clear only for nonelderly owners.

Those whose housing initially failed could achieve certification by either repairing or moving. For owners, however, the second option was so rarely chosen that we think it is ruled out by perceived transaction costs. Nonetheless, the owners of whom repairs were required were consistently more likely to achieve certification than renters of the same age and income.

That fact is most clearly revealed by Table 4.7, which shows certification success rates among those who did not achieve certification by passing the initial evaluation. The difference is most pronounced among those with incomes over $4,000; in Brown County, for instance, 74 percent of the elderly owners but only 43 percent of the elderly renters in that group achieved certification by either repairing or moving after an evaluation failure.*

Table 4.7 also shows powerful income effects. Among those who had to repair or move to achieve certification, those with low incomes (hence larger allowances) were much more likely to act effectively.

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*That interpretation must be qualified by noting that a few of those whose dwellings initially passed nonetheless moved or terminated before receiving payment authorization, and are therefore included in the denominators of the cited ratios. If movers, they are also included in the numerators. The qualification applies to all inferences drawn from Table 4.7.

Table 4.7

EFFECTS OF SELECTED HOUSEHOLD CHARACTERISTICS ON CERTIFICATION EFFORT: ENROLLEES FAILING INITIAL EVALUATION

Household Characteristic	Percent Who Achieved First Certification by:					
	Repairing After Initial Failure		Moving to Another Dwelling		Repairing or Moving	
	Brown County	St. Joseph County	Brown County	St. Joseph County	Brown County	St. Joseph County
Elderly Head						
Renter, by income:						
Under $4,000	59	61	14	6	73	67
$4,000 or more	33	46	9	--	43	46
Owner, by income:						
Under $4,000	82	81	(a)	(a)	83	82
$4,000 or more	74	76	--	--	74	76
Nonelderly Head						
Renter, by income:						
Under $4,000	51	41	24	21	75	62
$4,000 or more	40	27	14	14	54	41
Owner, by income:						
Under $4,000	80	68	(a)	2	80	71
$4,000 or more	63	57	(a)	(a)	63	57
All cases	58	56	12	10	70	65

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: Entries are based on data for 1,780 enrollees in Brown County and 2,579 in St. Joseph County who enrolled at least six months before the close of file and who did not achieve first certification by passing initial housing evaluations. Elderly household heads are 62 or over. Income is annual adjusted gross income.

[a]Less than 0.5 percent.

Thus, among nonelderly renters in St. Joseph County, 62 percent of those with incomes under $4,000 but only 41 percent of those with higher incomes achieved certification following an initial failure.

Age effects are less clear. In St. Joseph County, the elderly consistently coped more successfully with certification problems than the nonelderly, especially among owners. In Brown County, however, nonelderly renters did better than elderly renters, principally because of their greater willingness to move.

SUMMARY

During the two years covered by our data, 83 percent of all enrollees in Brown County and 78 percent in St. Joseph County achieved

certification of at least one dwelling. The percentages increase only slightly when clients enrolled for less than six months are excluded.

Combining data for the two sites, about 45 percent of all enrollees achieved first certification without effort, inasmuch as their preenrollment dwellings were acceptable to the HAOs. About 30 percent achieved certification by repairing those dwellings and 5 percent by moving; many of the movers also repaired their new homes. Among those who did not achieve certification, whether they had terminated or were still enrolled at the close of file, few tried very hard to do so. For only 8 percent of that group do we have any evidence of a repair action or move that might have led to certification.

In both sites, certification was most likely to be achieved by elderly homeowners with incomes under $4,000 and least likely for their opposites, nonelderly renters with incomes over $4,000. Whereas the elderly have some advantage in the initial acceptability of their homes, neither tenure nor income is consistently associated with that advantage.

Considering only those whose dwellings fail initially and who therefore must repair or move to achieve certification, the clearest message is that those with low incomes try harder. Controlling on income and age of head, owners in such circumstances were more likely to succeed than renters. Age effects are less clear.

Although the severity of the certification obstacles faced by different client groups varies, few clients who make an effort to remedy their housing defects fail to achieve certification. The inclination to make the needed effort apparently increases with the financial inducement offered by the HAO, and is greater for owners than renters.

V. DECISION PATHS AFTER FIRST CERTIFICATION

Some 3,480 enrollees in Brown County and 4,529 in St. Joseph County achieved their first housing certification before the end of the second program year and thus qualified for monthly allowance payments. This section summarizes the histories of those enrollees during the first postcertification year. During that time, some clients terminated their enrollments because they either became ineligible or were dissatisfied with the program. Others moved for reasons unrelated to the HAOs' housing requirements. At the close of file, about three-fourths were still in their first certified dwellings, but only about half in Brown County and 42 percent in St. Joseph County had received payments for a full year.

Approximately twelve months after an enrollee's dwelling is first evaluated, the HAO schedules an annual evaluation to determine whether the dwelling still meets program standards. If the dwelling passes, payments continue. If it fails, the occupant is informed that he must either repair the dwelling or move within 75 days; otherwise payments will be suspended until he is once again in an acceptable dwelling.

The twelve-month interval before the annual evaluation thus provides a suitable time-frame for describing all housing-related actions, including moves and terminations. Regrettably, however, our data concerning annual evaluations are seriously flawed in a way that casts doubt on the reliability of certain findings.

At the close of file, a number of annual housing evaluation forms (HEFs) in the year 2 machine-readable files delivered by the HAOs were unaccompanied by housing unit certification forms (HUCFs). As nearly as we can reconstruct from collateral evidence, most of the missing forms were for unacceptable dwellings and had not been completed or processed pending further action by either the client or the HAO--for instance, the repair and reevaluation of the dwelling.

In compiling the housing decision trees (Figs. 1 and 2), we mistakenly relied on the HUCFs to indicate whether an annual evaluation

had been conducted and how it came out, ignoring HEFs that were unaccompanied by HUCFs. Consequently, the trees undercount annual evaluations, overcount acceptable results, and undercount evaluation failures. Collateral data enable us to estimate the correct totals, but not to analyze the missing records.* The samples of failed annual evaluations captured in the decision trees are therefore subject to possibly severe record-exclusion and miscoding biases.

FIRST POSTCERTIFICATION DECISIONS

As shown in Table 5.1, 21 percent of all allowance recipients in Brown County and 17 percent in St. Joseph County terminated their enrollments before their annual evaluations were due. Eight and 4 percent, respectively, moved from their certified dwelling to some other dwelling but continued in the program. The remainder--71 and 77 percent--were still enrolled and still living in their first certified dwellings.

Terminating Enrollment

Most of the terminees dropped out at either their first semiannual or their first annual eligibility recertification. Most often, their incomes had risen to levels that made them ineligible or reduced their allowance entitlements to trivial amounts. The HAO declared some ineligible on the basis of their recertification data; other clients anticipated that outcome and simply failed to return the mailback semiannual recertification form or to appear for the annual recertification interview. Eleven terminees in Brown County and 26 in St. Joseph County later reenrolled.

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*By the time the problems discussed here were diagnosed, work had begun on a restructured HAO file format to encompass the first three years of program data. Rather than repairing the year 2 files, we decided to spend our efforts on the year 3 files with a view toward future analyses of the expanded data base.

In the decision trees, the clients whose annual evaluations were not included for lack of an HUCF are counted as still on the preceding branch at the close of file. Unfortunately, they cannot be distinguished from others who were not yet due for annual evaluations.

Table 5.1

FIRST POSTCERTIFICATION EVENT FOR ENROLLEES ACHIEVING FIRST CERTIFICATION

Item	Brown County			St. Joseph County		
	Number of Cases		Adjusted Percent of Total	Number of Cases		Adjusted Percent of Total
	Decision Tree	Adjusted		Decision Tree	Adjusted	
First Post-certification Event						
Terminate enrollment	725	725	21	788	788	17
Move to another dwelling	281	281	8	175	175	4
Annual evaluation	1,556	1,700	49	1,500	1,742	38
Close of file	918	774	22	2,066	1,824	40
Total	3,480	3,480	100	4,529	4,529	100
Annual Evaluation Result						
Acceptable	1,486	1,340	79	1,308	1,098	63
Unacceptable	70	360	21	192	644	37
Total	1,556	1,700	100	1,500	1,742	100

SOURCE: Tabulated by HASE staff from HAO records through 25 June 1976 for Brown County and 17 December 1976 for St. Joseph County.

NOTE: "Decision tree" entries are based on records selected for the trees shown in Figs. 1 and 2, but include 136 annual evaluations in Brown County and 80 in St. Joseph County that are not shown in the trees because they occurred after the client's sixth decision. "Adjusted" entries for annual evaluations are based on HAO management information reports through year 2 in each site, excluding an estimated 96 annual evaluations in St. Joseph County that were conducted on uncertified dwellings. The adjustments imply that the analysis of decision-tree records both undercounted annual evaluations and miscoded their outcomes. See accompanying text for discussion of that issue.

Moving to a Different Dwelling

Before their annual evaluations were due, 281 allowance recipients in Brown County and 175 in St. Joseph County moved from their certified dwellings. The table below shows their status at the close of file:*

*The outcomes are tabulated from Figs. 1 and 2, which do not follow all clients to the close of file. Consequently, some of those classified here as never having achieved another certified dwelling but being still enrolled may in fact have achieved certification before the close of file.

	Brown County		St. Joseph County	
	Number	Percent	Number	Percent
Achieved certification of another dwelling	252	90	128	73
Never achieved another certification:				
Still enrolled	20	7	28	16
Enrollment terminated ..	9	3	19	11
All cases	281	100	175	100

It appears that the risk of losing one's allowance in the course of changing dwellings was minor in Brown County but substantial in St. Joseph County. To be sure, the risk was avoidable except for a client who was involuntarily evicted: The decision to move could be reserved until a premove evaluation had been conducted and the HAO's views on the prospective residence were known. But a surprising proportion of movers first moved, then asked the HAO to evaluate their new homes.

Staying in the First Certified Dwelling

Although the decision-tree files report that about 1,500 allowance recipients in each site stayed in their first certified dwellings at least until annual evaluations were completed on them, we now estimate that the true figures were close to 1,700 in each site (see Table 5.1). The others that were still in their first certified dwellings at the close of file had not been there long enough to be due for annual evaluations.

Excluding those in the program for less than a year, we calculate that nearly two-thirds of the recipients in each site stayed in their first certified dwellings (and in the program) through their annual evaluations. The other third either moved or terminated before the year was up.

RESULTS OF ANNUAL EVALUATIONS

The "adjusted" entries in Table 5.1 show that among the dwellings evaluated after a year of recipient occupancy, 21 percent in Brown

County and 37 percent in St. Joseph County were found no longer acceptable. To continue receiving payments, the occupants had either to arrange repairs or move to acceptable dwellings.

As explained in the beginning of this section, the decision-tree files on which this report is principally based did not count annual evaluations right or always classify their results correctly. The small samples of evaluation failures that were clearly identified as such--70 in Brown County and 192 in St. Joseph County--may or may not be representative of all failures (about 360 in Brown County and 644 in St. Joseph County). Consequently, analysis of the characteristics of failed dwellings would not be fruitful.

SUMMARY

Enrollees' dwellings are evaluated annually to determine whether they still meet program standards. Between such evaluations, the occupants receive housing allowances unless they become ineligible or move to unacceptable dwellings.

Excluding those in the program for less than the full year, 27 to 29 percent of the allowance recipients in each site terminated their enrollments and 6 to 10 percent moved. The terminations mostly reflected loss of eligibility, whereas the moves reflected the movers' dissatisfaction with their HAO-approved dwellings. Among the movers, 90 percent in Brown County and 73 percent in St. Joseph County again achieved certification before the close of file.

About two-thirds of all recipients stayed in their first certified dwellings until the annual evaluations were due. Unfortunately, technical problems with the data prevent us from describing the evaluation results accurately. Other sources indicate that about 21 percent of the annual evaluations performed in Brown County and 37 percent in St. Joseph County were for dwellings that had fallen below program standards. To continue as allowance recipients, the occupants had to repair the new defects or else move to acceptable housing.

VI. DIRECTIONS FOR FURTHER RESEARCH

For most enrollees, the complex of HAO actions and client decisions that follows enrollment in the allowance program leads to housing certification and payment authorization, but often by indirect paths or after several attempts. The mission of our study was to identify all possible paths to all possible outcomes and learn which were empirically important. Succeeding in that aim, we also explored the household and housing characteristics associated with clients' decisions at critical junctures in their program histories, generating hypotheses for further research. Finally, our exploration of the data base served to audit its coherence and completeness; our findings will help us improve the final, five-year cumulative file of HAO records.

This section reviews our most important findings and discusses their implications for further research. Our comments are grouped under three headings: organizing the data, improving the data base, and testing behavioral hypotheses.

ORGANIZING THE DATA

The kinds of behavioral hypotheses that can be tested depend on how the HAO data are organized. With large, complex data bases, the organizational issues are especially crucial because formats once established are not easily altered. The housing decision trees displayed earlier represent the structure we chose for this analysis. Here, we appraise the strengths and weaknesses of the structural framework.

Salient Features of the Decision Tree

Our guiding interest is in how enrollees respond to HAO housing requirements. We chose the temporal sequence of program-related events in a client's life as the structural key because causal inference rests largely on that sequence. Note, however, that this

structure emphasizes temporal order, not elapsed time. Although we can calculate elapsed times for certain steps in a client's history (see Fig. 5), they were not treated as central.

A second key to our framework is that each client's program history is forced to alternate between two classes of events: an HAO action and a client decision. The neatness of that pattern aids enormously in organizing the data, but to achieve it we had to suppress some probably relevant information, do some violence to the distinction between HAO actions and client decisions, discard a substantial number of records or parts of records, and even alter some chronologies.

For example, we allow only one class of HAO actions--housing evaluations. We suppress such events as changes in allowance entitlements--which may also affect clients' decisions--and premove evaluations--unless the client actually moves to the evaluated dwelling. Although a payment authorization normally follows an "acceptable" evaluation, it is not automatic; to accommodate that fact, we define a payment authorization as part of a *client*'s decision (following a housing evaluation) to stay in a certified dwelling and draw his allowance. Similarly, enrollment termination is always formally and often substantively an HAO action; but we treat it as another *client* decision. We discarded between 6 and 9 percent of all candidate records in each site because they lacked the initial evaluations "needed" to prompt the client's first housing decision--even though, pursuant to program rules, those evaluations were not conducted.* We collected but did not use the posttermination records of clients whose enrollments were terminated but who were subsequently reinstated. Finally, we recorded premove evaluations as though they occurred after the move in question.

Some of those conventions are harmless so long as they are known to the analyst and his audience. Others--particularly the record exclusions--are worrisome because they bias the data base. Some but not all problems could be avoided by restructuring the framework to include

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*See p. 9.

null or dummy events--both HAO actions and client decisions. Others could be solved in a machine-readable representation of the decision tree, even though a graphic representation of additional detail might be unmanageable.

Much of the decision tree's tractability derives from the convergence of distinctly different client histories on a much smaller set of intermediate states. Thus, one client may have his preenrollment dwelling certified by its initial evaluation; another may repair twice, then move and repair again before he achieves a first certification. But both clients, once they achieve certification, face similar futures and can be grouped for analysis of their subsequent decisions. That structural advantage argues for keeping the number of possible client states manageably small, so that the groups will be large enough to analyze separately.

In this respect, our present structure seems sound. We define only two outcomes for an HAO action: A dwelling is either acceptable or unacceptable, despite the fact that our data distinguish degrees of unacceptability (e.g., number or type of housing defects). Clients' housing decisions are permitted only four outcomes: repairing and seeking a reevaluation, moving, terminating enrollment, or staying without repairing. All except the first can follow either an acceptable or an unacceptable housing evaluation; however, the consequences of the others depend on the prior evaluation. The client's predecision state therefore has only two values and his postdecision state has seven.

As will be explained shortly (see "Testing Behavioral Hypotheses," pp. 63-67), we assume that a client's response to an HAO action also depends on his own characteristics (age of head, income, household size) as well as those of his dwelling (occupant's tenure, length of residence, monthly housing costs, number of rooms, state of repair). The characteristics of both change, sometimes because of program-related actions, sometimes independently. The present study does not deal at all with changes in client characteristics, and only with changes in housing characteristics that are reflected in HAO evaluation reports. Thus, our analysis of the effects of client characteristics on certification outcomes and the paths by which they were

reached assumed that the relevant characteristics were those observed at the time of enrollment. Future analysis should have access to richer time-dependent data.

Enriching the Decision Tree

The several issues discussed above lead us to propose a new client record that would both enrich and increase the flexibility of future analyses. As was done for the decision tree, the new record would abstract both the client characteristics and housing characteristics files that Rand constructs from HAO administrative records; the record for each client would contain the four segments described below.

Event History. The first segment is a skeletal client history from enrollment to close of file, analogous to the nodes and branches of the graphic decision tree. The history consists of event triplets organized in chronological sequence. The first member of each triplet is an HAO action (A), the second a client decision (D), and the third is the client's resulting program status (P). The sequence of triplets is indexed by ($t = 1, 2, \ldots, n$):

$$A_1, D_1, P_1; A_2, D_2, P_2; \ldots; A_t, D_t, P_t; \ldots; A_n, D_n, P_n .$$

Under such a scheme, the range of HAO actions encompasses all those that affect the client's program status. The possible actions are coded as follows:

Value of A_t	HAO Action
1	Enroll or reinstate client
2	Terminate enrollment
3	Certify or recertify dwelling*
4	Decline to certify or recertify dwelling**
5	Authorize or reauthorize payments
6	Suspend payments

*Implies an "acceptable" housing evaluation.

**Implies either an "unacceptable" housing evaluation or a renter's failure to submit a copy of a lease.

The possible client decisions are much the same as in the present scheme, except that the sequence of housing actions and evaluation requests is clarified. Also, only voluntary terminations are counted as client decisions:

Value of D_t	Client Decision
1	Request evaluation of current residence
2	Repair current residence, request evaluation
3	Stay in current residence without repairing
4	Request evaluation of noncurrent residence
5	Move to uncertified dwelling
6	Move to certified dwelling
7	Voluntarily terminate enrollment

The third member of each triplet describes a client's program status following an HAO action and client decision. That status endures at least until the next HAO action; we define the following four:

Value of P_t	Program Status
1	Enrolled, payments not currently authorized
2	Enrolled, payments currently authorized
3	Eligible, not currently enrolled
4	Currently ineligible

Table 6.1 shows the 42 potential pairs of values for A_t and D_t and the resulting values of P_t. Eleven of the (A_t, D_t) doublets are infeasible, and all but three of the remainder map unequivocally onto one of the four program states. The exception are the doublets (3, 3) and (3, 4), which continue the program status of the preceding period, P_{t-1}. The doublet (2, 7) is taken to imply that the HAO's termination action resulted from a client's decision rather than the reverse; it therefore leads to program status 3 (eligible but not enrolled).

The triplet system yields a more accurate history of program-related events but is less compact than the decision tree. For example, in the current tree an enrollee whose preenrollment dwelling first failed, then was repaired and passed its reevaluation, achieves

Table 6.1

POTENTIAL TRIPLETS OF ACTIONS, DECISIONS, AND PROGRAM STATUS

HAO Action (A_t)	Program Status (P_t) by Client Decision (D_t)						
	$D_t = 1$	$D_t = 2$	$D_t = 3$	$D_t = 4$	$D_t = 5$	$D_t = 6$	$D_t = 7$
1	1	0	1	1	1	0	3
2	0	0	4	0	4	0	3[a]
3	0	0	1,2[b]	1,2[b]	1	1	3
4	0	1	1	1	1	1	3
5	0	0	2	2	2	2	3
6	1	1	1	1	1	1	3

SOURCE: Analysis by HASE staff. See accompanying text for coding guides.

NOTE: A zero entry indicates that the doublet A_tD_t cannot empirically assume its indicated value.

[a]The doublet (2, 7) implies that the HAO's termination action resulted from a client's decision rather than the reverse.

[b]Program status at time t is unchanged from $(t - 1)$, which could be either 1 or 2.

first certification in three steps (decision levels). Under the proposed scheme, the sequence would be expressed in four triplets or temporal steps, as follows:

t	A_t	D_t	P_t
1	1	1	1
2	4	2	1
3	3	3	1
4	5	3	2

The additional step reflects the separation of housing certification and payment authorization as distinct HAO actions.

Event Duration. The second segment of the proposed client record keys event durations to event history. Its entries have the form

$$E_{11}, E_{12}; E_{21}, E_{22}; \ldots; E_{t1}, E_{t2}; \ldots; E_{n1}, E_{n2},$$

where E_{t1} is the number of days between the HAO's action and the client's decision and E_{t2} is the number of days between the client's decision and the next HAO action. The latter is equivalent to the duration of program status P_t; $E_{t1} + E_{t2}$ is the full event duration.

Client Characteristics at Time t. The third record segment is a matrix of k client characteristics abstracted from the client characteristics file (CCF). For each characteristic (such as household size or adjusted gross income), a value would be entered for each event-history triplet. Thus, a row of the matrix would read

$$C_t, C_{t2}, \ldots, C_{ti}, \ldots, C_{tk} .$$

Some client characteristics (race of head) do not change, and some (age of head) change slowly but predictably. Others (income, household size) may change abruptly or erratically. However, the HAO normally collects data on changeable characteristics only semi-annually or annually. Consequently, only a few variables would change value between any two successive times. Even so, organizing the client data in this way facilitates relating current client characteristics to current decisions.

Housing Characteristics at Time t. The final record segment is a similar matrix of m housing characteristics abstracted from the HEFs and HUCFs. The former is our source of physical characteristics, the latter our source of financial characteristics. A row of the matrix would read

$$H_{t1}, H_{t2}, \ldots, H_{tj}, \ldots, H_{tm} .$$

Housing characteristics could be updated following each evaluation--therefore, at least annually and following most moves.

Conclusions

Although the present event history and its graphic representation in the decision trees serve well to illuminate clients' decision paths, we think future analysis should strive for a fuller event

history and more auxiliary data on client and housing characteristics. The proposal presented above, perhaps in inappropriate detail, shows that a richer data base could be organized to permit easy manipulation. For example, one could identify each enrollee's first certification by reading the event history segment of his record, then test hypotheses about preceding or following events and their causes. Or one could accumulate elapsed times between any two events (enrollment to first certification) and analyze the contributions of intervening events. Or one could count the frequency with which specific HAO actions were followed by specific client decisions.

IMPROVING THE DATA BASE

The present study has been particularly valuable as an audit of the first two years of program data. The housing decision tree forms a many-branched logical structure into which clients' transactions with the HAO should consistently fit. When a client's record shows impossible sequences of transactions, either a portion of the record is missing or misdated or else the outcome of some prior transaction is miscoded. For example, if a client's current residence fails its initial evaluation, yet is subsequently certified for occupancy, there should be an intervening deficiency reevaluation report. The absence of such a report implies either miscoding of the initial evaluation result or a misplaced reevaluation record--perhaps lost, perhaps misdated.

Overall, the data are in good condition for administrative records. As reported in Table 1.1, we used 85 percent of all client records from the Brown County HAO and 80 percent of those from the St. Joseph County HAO. Moreover, most of the deletions were not erroneous records but records whose event histories could not be accommodated in our simplified decision tree. We estimate that between 90 and 95 percent could have been used had we accepted records for households so recently enrolled that their initial evaluations or associated housing unit certifications were pending, as well as records for households whose preenrollment dwellings were legitimately not evaluated. However, we also encountered a variety of problems with some records that were

accepted into our data base, the most conspicuous of which are discussed in Sec. V.

Sources of Decision-Tree Data

The history of the working file used in this study casts light on the sources of errors and how they may be corrected or avoided in constructing successor files. To begin with, the HAO's hardcopy administrative forms are abstracted and transcribed into six machine-readable files, designed to support administrative requirements. The files, which are all cumulative, are delivered to Rand quarterly. At the end of each program year, we reorganize the data from five of the files into two research files: the CCF and the housing characteristics file (HCF).

The CCF contains a record for each applicant who is interviewed by the HAO, abstracted from his enrollment application and the last subsequent eligibility recertification form, the termination and reinstatement log, and the first and last HUCFs.* However, the record does not contain a complete client history, concentrating instead on the client's circumstances at enrollment and close of file. The intervening housing evaluations, moves, and eligibility and payment actions are excluded.

The HCF contains a record for each housing evaluation conducted by the HAO and the associated HUCF. The records are cross-referenced to the CCF by identifying the client on whose behalf the evaluation was conducted. To each evaluation record we append selected data from the CCF, including basic client characteristics and information on household finances and housing expenses.** The working file for the housing decision tree was constructed by chronologically ordering all the records from the HCF that pertained to a given client. During that process, missing housing evaluation records and apparent chronological errors were discovered. But neither the CCF nor the HCF

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*See Marsha A. Dade and Ann W. Wang, *Codebook for the HAO Client Characteristics File: Site I, First Year*, The Rand Corporation, WN-9433-HUD, May 1976, for details.

**For details, see Iao M. Katagiri and Ann W. Wang, *Codebook for the HAO Housing Characteristics File: Site I, First year*, The Rand Corporation, WN-9504-HUD, July 1976.

contains a complete chronology of a client's program history to serve as a framework for the merger. Indeed, some events are not recorded in either file, though they are available from the HAO's source files.

One belated discovery that hampered our work was that the HAO record system does not report changes of residence as dated events. Moves must be inferred by comparing the housing unit identification code on successive HEFs or HUCFs; and the date of a move must be inferred from those same documents or from a retrospective question on the annual recertification form. Because clients can request evaluations of prospective residences to which they never move, or can move before requesting an evaluation, the inferences are error-prone.

Other apparent errors in chronology reflect mistakes in the dates on HAO hardcopy records or subsequent transcription errors. Some confusion was created by undocumented administrative practices such as holding certain forms (e.g., HUCFs) until a client takes an anticipated action, then updating the form before submitting it for computer processing. In a few instances, the HAOs have "tricked" the computer into accepting records that are correct but do not conform to preprogrammed editing specifications; we discover such events when we ask the HAOs to explain anomalous codes or infeasible transaction sequences.

New HAO File Formats

Analysis of the CCF and HCF through year 2 in each site not only turned up anomalies on individual records that could only be resolved by casework, it also highlighted weaknesses in the organization of the data base. Consequently, we are reorganizing and expanding the research files, beginning with the HAOs' cumulative records through year 3. Since the later files will encompass the earlier ones, we do not propose to remodel year 1 and year 2 files separately.

Under the new plan, the CCF is modified in various details but its basic format is unchanged. Each record contains data on a client's circumstances at enrollment and at the close of file, omitting intermediate history. It is a summary record, useful for many purposes because of its brevity.

We plan a new recertification history file (RCF), which contains for each enrollee an abstract of the enrollment interview form, followed by an abstract of each subsequent semiannual and annual recertification form through the close of file. The client record thus contains a complete history of enrollment status and allowance entitlement, along with a (usually) semiannual update of client characteristics.

The HCF is to be reorganized. Whereas previously it was simply a file of HEFs linked to the corresponding HUCFs, the new version sorts the forms chronologically by client. Thus, a client record contains an abstract of that client's CCF record, followed by abstracts of all HEF/HUCF records pertaining to that client. It provides a complete housing history for the client, from the initial evaluation of his preenrollment dwelling through subsequent deficiency reevaluations, annual evaluations, and premove or postmove evaluations--each segment reporting the evaluation outcome, housing certification action, and payment authorization.

The new HCF would have sufficed to construct the decision trees for the present report. The more detailed event history proposed earlier in this section would require a chronological merger of each client's RCF and HCF records. We recommend a virtual rather than an actual merger: A segment should be added to the CCF records to record the detailed event history of each client in the event-triplet form described earlier, each event cross-referencing by means of identification numbers the relevant record segments of the RCF and HCF.

Under that scheme, errors and ambiguities in the chronologies of both eligibility and housing transactions and in the coding of transaction outcomes that affect a client's program status would need to be resolved in the course of file preparation. Once such problems were cleared up, the event history would be extremely useful for sorting clients into analytically significant groups as well as for retrieving details of their transactions and their household and housing characteristics from the RCF and HCF.

TESTING BEHAVIORAL HYPOTHESES

The principal aim of the present study was to discover how clients achieved housing certification and thus qualified for payments. In

the process, we noted and duly reported various relationships between client characteristics, housing characteristics, and client decisions in response to HAO actions. Our observations led in turn to speculations about causes and effects, not rigorously testable within the limits of this study. Here, we review those specifications with a view to future research.

Clients' Attitudes Toward Housing Defects

About half of all enrollees live in dwellings that do not meet the HAO's standards for living space, essential domestic facilities, or health and safety hazards. The most common defects are stairways lacking handrails, too few habitable rooms, inadequate bathrooms, and unsafe utility systems. During the two-year period of this report, the enrollees whose dwellings most often failed had large households, were nonelderly or nonwhite, or lived in inexpensive homes. Failure rates for renters and owners were similar overall.

With the exception of undersized dwellings, most of the recorded defects were repairable at relatively low cost to the occupant or his landlord. Another study of HAO repair logs has shown that the median cash outlay for repairing a failed dwelling was about $10 in both sites; three-fourths of the clients reported outlays of under $25 (Brown County) or $30 (St. Joseph County).* Even for low-income households, those sums are hardly prohibitive. Why did the occupants endure the defects before joining the program?

An obvious explanation is that they were unaware of the defects or unconcerned about them. Their standards of housing quality and their perceptions of housing hazards may differ sharply from those reflected in the HAO requirements. However, about two-thirds of those in failed dwellings repaired them or moved to qualify for allowances. It is not clear whether they perceived their housing improvements as direct benefits or merely as the means to financial benefits.

*The figures do not include unpaid labor by the occupants, their friends, or their landlords. Only a small share of the work was done by paid labor; the cash outlays are mostly for materials.

If, as we believe, our enrollees' housing is fairly representative of the nation's low-income housing, the above issues are important for national policy. If inadequate housing does not reflect budgetary stringency (as distinct from ignorance or indifference), programs that seek housing improvements through pure income supplements may miss the mark. On the other hand, an earmarked allowance program could perhaps be viewed as an expensive bribe to persuade indifferent citizens to meet the community's housing standards.

Doubtless the truth lies somewhere between such extremes. Rigorous analysis of the attitudes and behavior of HAO enrollees is needed to distinguish cause and effect.

Why Some Clients Fail To Achieve Certification

About a third of those whose housing initially fails evaluation never succeed in achieving certification. Instead they terminate their enrollments, usually at the time of a semiannual or annual recertification.

The percentage of both enrollees who move from unacceptable dwellings and enrollees who terminate rises sharply with the number of reported housing defects. Those clients are presumably avoiding the expense or trouble of multiple repairs and, in the case of terminees, are willing to forgo the allowance rather than repair or move. Housing tenure, age of head, household size, and amount of allowance entitlement all seem related to the choice between repairing, moving, or terminating; but the relationships are complex and need further study.

One surprising observation is that the occupants of unacceptable dwellings decide on their next action (repair, move, or terminate) without much exploration of alternatives. Those who repair and those who terminate almost never request evaluation of other dwellings, even though the request entails little effort for the client; we presume that the absence of such requests reflects equally the absence of market exploration. Even those who move rarely ask for evaluations of more than one alternative; moreover, it is common for a client to move before requesting an evaluation, even though the HAO advises premove evaluations to forestall disappointment.

Among those who never achieved certification, whether terminated or still enrolled at the close of file, few seem to have tried very hard. For only 8 percent of that group do we have any evidence of a repair action or a move that might have led to certification. Conversely, nearly everyone who tried (as evidenced by repair attempts or moves) eventually succeeded.

From several perspectives, clients thus seem to divide into "actives" and "passives." As evidenced by the fact of enrollment, both groups wanted allowances; but only the former exerted themselves to qualify for payments. The data indicate that those with very low incomes and those who own their homes try harder than their opposites; the effects of age are not clear.

The housing allowance program is unusual among federal programs in the clarity of its incentives for client self-help. Our data show that those incentives have been generally effective in producing the desired behavior. However, the exceptional clients need further study as to whether they comprise a group for whom the incentives are weak, one for whom the obstacles to self-help are formidable, or one for whom the link between effort and outcome is poorly understood.

Repair Histories

The working files constructed for this study proved inadequate to support even a descriptive analysis of the outcomes of annual evaluations and the types of housing defects they revealed. Other data indicate that a fifth (Brown County) to a third (St. Joseph County) of all annual evaluations reported one or more housing defects that were not in evidence when the dwelling was certified for occupancy a year earlier.

An interesting issue is whether the defects discovered during the annual evaluation of a given dwelling resemble those discovered during its initial evaluation and subsequently repaired. In other words, are initial defects cosmetically repaired for program purposes, only to recur after certification? Or do subsequent defects merely reflect expectable wear and tear? Moreover, there are related questions about the voluntary repairs and improvements undertaken by

clients between annual evaluations, presumably facilitated by their increased income from the allowance. Do those voluntary actions forestall deterioration that would otherwise surface as defects when the dwelling was next evaluated, or do they concern aspects of the dwelling that matter less to the HAO?

Beginning in 1976, a repair log was added to the HEF. It is used to gather data on repairs made since the last evaluation--the nature of the repair, who did it, what it cost, and so forth. Although the data will never be available for pre-1976 records, we now have enough subsequent evaluations (both deficiency and annual) to analyze the repair data in conjunction with the evaluation deficiency list. Such analysis is high on our agenda.

SUMMARY

The study reported here was undertaken to identify the paths that enrollees might follow in pursuit of housing certification and to learn which were empirically important. The process also served to audit the two data bases used, each representing two years of program history in Brown and St. Joseph counties. Finally, we explored the household and housing characteristics associated with clients' decisions at critical junctures in their transactions with the HAOs.

The decision tree of alternating HAO actions and client decisions that we used to summarize each client's history proved itself as an effective device both for organizing the data and for auditing the data base as to missing records, incorrect chronologies, or miscoded transactions. However, it covers only housing-related events, leaving out such influences on client decisions as HAO actions to change allowance entitlement or suspend payments; and it suppresses information about postenrollment changes in household circumstances that might affect a client's decisions. We therefore recommend a recasting of the decision tree into a more detailed "event history" record for each client; that scheme will give us more analytic flexibility in future research and will also resolve many of the data problems encountered during file preparation for the study reported here. Topics for research with subsequent files, organized in the new format,

include client attitudes toward housing defects, why clients succeed or fail in achieving housing certification and thus in qualifying for payments, and the effectiveness of both program-related and voluntary housing repairs in forestalling deterioration.

Appendix A

ELIGIBILITY TESTS, HOUSING STANDARDS, AND PAYMENT AUTHORIZATION

To help the reader understand the circumstances within which HAO clients made their housing decisions, this appendix summarizes the rules that governed enrollment in the program, housing certification, and qualification for monthly payments during the two program years covered by the study. The rules, embodied in a *Housing Allowance Handbook* maintained by each HAO, are with trivial exceptions identical in Brown and St. Joseph counties, as are the HAOs' administrative procedures and record systems.

To receive a housing allowance, an eligible household must first enroll, then obtain a housing certification and a payment authorization. Enrollment is restricted to those whose households meet certain requirements as to composition, income and assets, and location of residence. Housing certification is governed by the HAOs' housing standards, consisting of 37 specific tests of spaciousness, essential facilities, and health or safety hazards. Payments are authorized for an enrollee who lives in certified housing upon submission of certain documents. Renters must submit an executed lease; for part of the study period, a lease-leaseback agreement with the HAO was required of homeowners.

An enrollee may continue indefinitely in the program without securing a housing certification; he may secure a housing certification but fail to supply the documents needed for payment authorization; he may lose his housing certification by moving or by failing an annual evaluation; and payments may be suspended for that reason or for failure to comply with other program rules. Consequently, the HAOs always have on their records a number of enrollees who are not currently receiving payments but could do so if they took certain actions. Also, a recipient may be terminated from the program because he has become ineligible. Terminees may later apply for reinstatement if their circumstances change.

ELIGIBILITY STANDARDS

The following standards applied in both sites through December 1976, the end of year 2 in St. Joseph County. (Year 2 ended in Brown County in June 1976.)

Household Composition

The household must consist of two or more related persons, at least one of whom is an adult. A single person is eligible only if he or she is at least 62 years of age; or, if under 62, is handicapped, disabled, or residentially displaced by public action.

Income

The program's income limit is calculated by formula from a schedule of standard housing costs that is specific to each site and varies with household size. The income limit is linked to the assistance formula, which sets allowance entitlement equal to the difference between the standard housing cost and a fourth of the applicant's adjusted gross income. An applicant entitled to at least $10 monthly can enroll; once enrolled, he may continue in the program so long as his entitlement exceeds zero. Essentially, then, the income limit equals four times the standard cost of adequate housing for a household of the relevant size.

Housing costs are measured periodically in each site by market surveys. During the first two program years, each site's schedule of standard costs was revised only once, toward the end of year 2. The amounts before and after revision are shown in Table A.1, together with corresponding income limits.

Adjusted gross income includes all cash income to household members, including transfers, but excluding nonrecurring benefits, inheritances, or gifts; in the case of a homeowner, it also includes an amount equal to 5.0 percent of the estimated value of his equity in his home. The adjustments allow the exclusion of 5 percent (10 percent for elderly household heads) of gross income; $300 for each secondary earner or dependent; and unusual medical, childcare, or work-related expenses.

Table A.1

STANDARD HOUSING COST AND ENROLLMENT INCOME LIMIT BY SIZE OF HOUSEHOLD: FIRST TWO PROGRAM YEARS

Number of Persons	Brown County		St. Joseph County	
	June 1974	April 1976	Dec 1974	Sep 1976
Standard Cost of Adequate Housing ($ per month)[a]				
1	100	125	100	115
2	125	145	125	140
3-4	155	175	145	160
5-6	170	195	160	175
7-8	190	210	170	185
9+	220	230	170	185
Adjusted Gross Income Limit for Enrollment ($ per year)[b]				
1	4,320	5,520	4,320	5,040
2	5,520	6,480	5,520	6,240
3-4	6,960	7,920	6,480	7,200
5-6	7,680	8,880	7,200	7,920
7-8	8,640	9,600	7,680	8,400
9+	10,080	10,560	7,680	8,400

SOURCE: HAO policy clarification memorandums 141, 158, 186, and 193.

[a]Estimated monthly cost of shelter and utilities for a dwelling of the indicated size that meets specified quality standards.

[b]Limit for continued participation is $480 greater in each case.

Assets

Even though income is within the specified limit, a household may be ineligible because its assets are excessive. The asset limit during the years in question was $20,000 for households headed by persons under 62 years of age and $32,000 for those headed by older persons. Assets include stocks, bonds, checking and savings accounts, and real estate. The value of all assets is net of indebtedness.

Residence

Only a resident of the program jurisdiction may enroll, and enrollment is terminated when the client leaves that jurisdiction. In Brown County, the entire county participated in the program throughout the first two years. In St. Joseph County, the program began in South Bend and expanded to the rest of the county by steps that were completed on 1 November 1976.

Procedures

The eligibility of an applicant is determined from information he submits in the course of an interview, with critical items subsequently checked by HAO staff. An eligible household is informed of the amount of his entitlement and invited to sign a participation agreement, which is the final step in enrollment.

Eligibility and entitlement are rechecked annually by personal interview and by mail semiannually between interviews. If family size or income has changed, entitlement is adjusted accordingly. If the household is no longer eligible for assistance, it is notified that its enrollment has been terminated. Those procedures are followed whether or not the enrolled household is currently receiving payments.

HOUSING STANDARDS

The HAO's housing standards are derived from national model codes such as those promulgated by the Building Officials and Code Administrators Association and the American Public Health Association. Their requirements were reconciled with local codes on some items and adapted to form a 37-item checklist. Some items pertain to specific facilities, others apply to every room, and some to the unit, building, or property as a whole. The requirements are grouped below under three general headings and summarized in less detail than the checklist provides.

Essential Space and Privacy

There must be one habitable bedroom for every two persons (up to a maximum of four bedrooms) and a habitable general-purpose room for households of three or more persons. A *habitable room* must have at least 70 square feet of floor area, a ceiling height of at least 6.5 feet over 35 square feet of floor area, adequate natural light to permit normal domestic activities, adequate ventilation from at least one openable window or a mechanical device, a working electrical outlet, and a permanent source of heat. Bedrooms must have rigid walls, secured in position from floor to ceiling, and a doorway with a closable door or curtain. These rooms must not be adapted for use as kitchens, bathrooms, or utility rooms.

Essential Facilities in Good Working Condition

The dwelling must have an adequate kitchen and bathroom accessible to the client but not necessarily for his sole use.

The *kitchen* must have a ceiling height of at least 6.5 feet over 35 square feet of floor area, adequate light from natural and artificial sources, an openable window or other ventilation device, at least two electrical outlets (one of which may be a lighting fixture), an operable sink supplied with hot and cold running water, an operable cooking range with at least one burner and an oven, and an operable refrigerator.

The *bathroom* must have a permanent source of heat, an openable window or other ventilation device, an electrical outlet or lighting fixture, an operable flush toilet, sink, and bathtub or shower supplied with hot and cold running water. The toilet and bath must have an enclosure that gives privacy to the occupant.

Health or Safety Hazards

The *exterior property area* must be well drained; free from accumulated litter that may harbor pests, impede access, or create a fire hazard; and without overgrown plantings that impede access, block natural light, or endanger structures. Accessory buildings and fences must be structurally sound.

The *building exterior* must be structurally sound, functional, and weathertight. The specific features checked include foundations, walls, roofs, chimneys, gutters, downspouts, windows, doors, hatches, stairs, porches, and railings. Handrails are required on stairways of six or more steps and around porches that are four or more feet above grade.

The *building and unit interior* must be without accumulated litter that may harbor pests, impede access, or create a fire hazard. There must be at least one safe exit from the unit and two from the building that lead to open space outside the building. Ceilings, walls, and floors must be free from holes, buckling, dry rot, insect damage, and persistent moisture. Stairs must be structurally sound, and a handrail is required for six or more steps. Bathrooms and kitchens must have floor coverings that are impervious to water and their facilities must be in good repair, free of water or gas leaks and electrical hazards. Plumbing, electrical, space heating, and water heating systems must be permanent installations in good operating condition, properly connected, insulated, sealed, and vented, with ample safety or overload devices.

Procedures

These standards are enforced by periodic on-site inspections

conducted by trained evaluators from the HAOs. The typical housing evaluation requires about 25 minutes. Tests show that evaluators' findings are highly reproducible by independent inspections.

The evaluator reports the number of habitable rooms and the status of the other 36 items on his checklist. The number of rooms is compared with the size of the client's household to test the space standard. An unacceptable rating on any of the 37 items fails the dwelling. The failure is reported to the client along with a description of the dwelling's deficiencies. Arranging for repairs is entirely the client's responsibility. When repairs have been completed, the client may call for a reevaluation of defective items.

When a household moves, payments are suspended after 30 days unless the new dwelling is evaluated and approved by the HAO. Clients are encouraged to request evaluations of prospective residences before moving but often move, then call for an evaluation.

Each client's dwelling is evaluated annually (on the same cycle as annual eligibility recertification), whether or not the client is currently receiving payments. A move-related evaluation satisfies the annual evaluation requirement only if conducted within 60 days of the scheduled date for the annual evaluation.

Recipients who fail annual evaluations must repair their dwellings or move to acceptable housing within 75 days to avoid suspension of payments.

PAYMENT AUTHORIZATIONS

The HAOs authorize monthly payments to a client only after receiving an executed participation agreement, a housing unit certification form reporting an "acceptable" housing evaluation, and an executed lease (renters) or lease-leaseback agreement (homeowners).

The renter's lease must contain certain standard clauses required by federal law for assisted housing; but they do not include any special protection against eviction by normal civil procedures. The lease-leaseback agreement for homeowners was designed to define them as renters

for program purposes. The agreement was revokable at will by the homeowner and entailed no transfer of responsibility for property maintenance or financial obligations. New legislation enabled the HAOs to drop the lease-leaseback requirement in September 1975; thereafter, homeowners were authorized for payments without that formality.

Although occupants of federally subsidized dwellings (whether publicly or privately owned) can enroll in the program, they cannot be authorized for payments until they move to acceptable unsubsidized dwellings.

Appendix B

MODELING CERTIFICATION SUCCESS

Sections II and III of the text show that various characteristics of enrollees' households are related to both their initial evaluation results and their first postevaluation decisions. Because the household characteristics are themselves intercorrelated, it is not always clear which are salient in those relationships.

Section IV traces client decisions and their outcomes further, to first certification of a dwelling or close of file, whichever comes first. The text shows how age of household head, housing tenure, and household income affect certification success rates. Those specific variables were chosen from a larger set by comparing the goodness of fit for alternatively specified models of certification success. This appendix describes the models and the tests used to choose between them.

Although the chosen model can be used to estimate certification success rates for each of eight types of enrollee, it is not a behavioral model in the usual sense of that term. The housing decision trees shown in Figs. 1 and 2 present a full account of the sequence of housing decisions facing those who enroll in the program. At each decision point, we suppose that the enrollee's choice is affected by a variety of factors, including (a) the characteristics of his household, (b) the characteristics of his dwelling, (c) the last prior action by the HAO, (d) the enrollee's perception of alternative housing opportunities, and (e) the history of his dealings with the HAO, which helps him to forecast its response to his next action. A generalizable behavioral model would require data on all these factors as they bear on each decision in the sequence leading to certification or termination of enrollment absent certification.

Here, we work with a reduced form of the decision tree, collapsing all the HAO's actions and all the enrollee's decisions prior to first certification or termination into a single event whose outcome is assumed to depend only on characteristics of the client's household. The validity of this reduced form is supported by the observation

that, empirically, those who worked actively toward certification nearly always achieved it, regardless of their initial housing conditions; whereas those who never achieved certification rarely tried seriously to overcome the housing obstacles they faced. That pattern suggests that household characteristics determine the *likelihood* of certification, whereas housing characteristics are reflected in the *path* to certification. By testing models with different combinations of household characteristics, we can learn which are salient.

Unless an enrollee's dwelling passes its initial evaluation, the final outcome of his efforts to achieve certification may not be known for some months. We therefore restricted the analysis to households who enrolled in the program at least six months before the close of file. Excluding recent enrollees left us with 3,403 records for Brown County and 4,456 for St. Joseph County, nearly all of which were for households that had either achieved certification or terminated their enrollments. Although the reduced file does contain some records for households who had neither achieved certification nor terminated, we did not factor out those cases. Rather, we divided the population only into those who had achieved first certification and those who had not. The certification success rate is defined as the percentage of all households in a specified group that had achieved their first certification before close of file.

Exploratory analysis identified a number of household characteristics that were directly or indirectly related to certification success: age of head, race of head, housing tenure, household size, adjusted gross income, and amount of allowance entitlement. Because these characteristics are intercorrelated, not all are needed to explain certification outcomes. We used a logit model of certification success to select the parsimonious combination of variables that best accounts for intergroup variations in certification success rates.

Because first certification is a binary variable ($C_i = 0, 1$), we can observe the probabilistic outcome only for a group j consisting of

N_j enrollees. Then,

$$P_j(C_i = 1) = \frac{1}{N_j} \sum_{i=1}^{N_j} C_i \ .$$

We define each group j to consist of enrollees that have the same set of household characteristics, the latter being represented by

$$x_{1j}, x_{2j}, \ldots, x_{kj} \ .$$

The elements $x_{1j}, x_{2j}, \ldots, x_{kj}$ may naturally be binary variables (e.g., tenure = renter, owner) or they may be transformed to binary variables by partitioning a continuous variable into ranges (e.g., age = under 62 years, 62+ years). For k independent binary variables, the number of distinguishable groups is 2^k, though not all the groups need appear in a given data set. The more groups that are thus defined, the smaller each group and the greater the sampling variance of P_j.

We tested five household characteristics as candidate independent variables, each having shown in crosstabulation some evidence of relationships with certification success:

Independent Variables	Possible Values
Age of household head	0 = under 62 years 1 = 62+ years
Race of household head*	0 = white 1 = nonwhite
Size of household	0 = 1-2 persons 1 = 3+ persons

NO! should be a continuous variable

*Tested only for St. Joseph County, because nonwhite enrollees were scarce in Brown County.

Independent Variables	Possible Values
Housing tenure	0 = renter 1 = owner
Annual adjusted gross income	0 = under $4,000 1 = $4,000+

We regressed a transform of the certification success rate on various combinations of these variables, the number of observations equalling the number of groups formed by the selected subset of variables. The transformation into logarithm units, or "logits," constrains the regression parameters so that success rates estimated from them can never fall below zero or above unity:

$$\Psi_j = ln \left\{ \frac{P_j}{1 - P_j} \right\}.$$

Additionally, we equalized the variances of the regression error terms by weighting each observation with the value

$$W_j = N_j P_j (1 - P_j),$$

and performed a weighted least squares regression to determine the values of the parameters b_o, b_1, ..., b_k, which minimize

$$\sum_{j=1}^{2^k} \frac{1}{W_j} \left\{ \Psi_j - (b_o + b_1 x_{1j} + b_2 x_{2j} + \ldots + b_k x_{kj}) \right\}^2.$$

The estimating equation then becomes

$$\hat{\Psi}_j = b_o + b_1 x_{1j} + b_2 x_{2j} + \ldots + b_k x_{kj} \quad .$$

The estimated logits were then back-transformed to estimated certification success rates as follows:

$$\hat{P}_j = \left\{ 1 + e^{-\hat{\Psi}_j} \right\}^{-1} \quad .$$

To choose between alternative models, we used a χ^2 test which, though designed for inferential testing, has reasonable properties for our purposes. A model's χ^2 value is essentially the sum of squared errors in estimating P_j, weighted positively by the numerical importance of the group and negatively by the deviation of the estimated success rate from 0.5:

$$\chi^2 = \sum_{j=1}^{2^k} \left\{ \frac{N_j (P_j - \hat{P}_j)^2}{\hat{P}_j (1 - \hat{P}_j)} \right\} \quad .$$

To compare models with differing numbers of independent variables, we took into account each model's degrees of freedom, d, entering probability tables for $\chi^2(d)$, where

$$d = 2^k - k - 1 \quad .$$

The level of statistical confidence for the calculated values of $\chi^2(d)$ is shown in Table B.1 for each of five alternative models of certification success, d varying directly with the number of independent variables.

Model A, with four household characteristics that distinguish 16 groups of enrollees, best estimated the likelihood of achieving certification by repairing failed dwellings. Models B through E each use three variables to distinguish 8 groups of enrollees. D was especially good for estimating certification by moving and E for estimating both certification by staying in an initially acceptable dwelling and certification by any method.

We prefer Model E, which uses age, tenure, and income to explain certification outcomes. It performs much better than any alternative in estimating certification success rates by any method, and ranks near the top for each specific method. We used Model E to estimate P_j for each of the 8 groups of enrollees defined by age, tenure, and income, with the results shown in the first two columns of Table B.2.

Certification success rates for these 8 groups have a fairly narrow range, from 71.4 to 92.9 percent. It is not surprising that we could achieve a reasonable fit with four parameters (a regression constant and coefficients for each of three variables), but it is surprising that the estimated values are so close to the observed values. The poorest fits are for elderly, high-income households, both renters and owners.

We applied the model to data for St. Joseph County, using the same groupings of enrollees but reestimating the parameters. The results are shown in the last two columns of Table B.2.

Note that the range of observed certification probabilities is much larger in St. Joseph than in Brown County, running from 58.3 to 91.1. The estimated values are again very close to the observed values, and the poorest fits are again for elderly, high-income households.

These results do not establish that age of head, tenure, and income are the only variables affecting certification success but do

Table B.1

GOODNESS OF FIT FOR ALTERNATIVE MODELS OF HOUSEHOLD CHARACTERISTICS AFFECTING CERTIFICATION SUCCESS

Regression Model		Significance of χ^2 Statistic for Alternative Certification Methods			
Specification	Independent Variables	Pass Initial Evaluation	Repair After Evaluation Failure	Move From Preenrollment Dwelling	Any Method
A	Size, age, tenure, income	.148	.987	.278	.053
B	Size, age, income	.085	.829	.681	.010
C	Size, tenure, income	.305	.644	.074	.019
D	Size, age, tenure	.052	.728	.828	.033
E	Age, tenure, income	.461	.834	.777	.731

SOURCE: Analysis by HASE staff of HAO records for Brown County through 25 June 1976.

NOTE: Alternative models are defined by alternative sets of independent variables; each model was fit to observed probabilities of certification by each method shown. Entries are levels of statistical confidence, the larger values indicating better descriptive power. The data set excludes clients enrolled for less than six months at the close of file.

establish that those variables are a parsimonious selection from among those available. We use them in Tables 4.5 and 4.7 of the text to distinguish groups within the enrolled population whose certification experiences have differed.

Table B.2

ESTIMATES OF CERTIFICATION SUCCESS RATES FROM DATA ON HOUSEHOLD CHARACTERISTICS: MODEL E, APPLIED TO BROWN AND ST. JOSEPH COUNTIES

Household Characteristics	Percentage of Enrollees Who Achieved First Certification			
	Brown County		St. Joseph County	
	Observed	Estimated	Observed	Estimated
Elderly Head				
Renter, by income:				
Under $4,000	89.7	90.1	82.8	84.0
$4,000 or more	78.1	79.8	78.6	74.0
Owner, by income:				
Under $4,000	92.9	93.4	91.1	91.6
$4,000 or more	88.9	85.9	88.2	85.5
Nonelderly Head				
Renter, by income:				
Under $4,000	86.0	85.5	73.9	73.3
$4,000 or more	71.4	71.7	58.3	59.9
Owner, by income:				
Under $4,000	89.7	90.0	85.3	85.1
$4,000 or more	79.2	79.6	75.0	75.5

SOURCE: Analysis by HASE staff of HAO records through 25 June 1976 in Brown County and 17 December 1976 in St. Joseph County.

NOTE: Model E is described in Table B.1 and accompanying text. The model's parameters were estimated separately for Brown and St. Joseph counties.