

EXTENDABLE HOUSES: PROCESS AS ALTERNATIVE

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ABSTRACT

This paper investigates the opinions and perceptions of building by pre-planned increments as a means for attaining owned, single-family detached housing. Subjects chose among three alternatives: 1) buying or building a completely finished house, 2) building an "unfinished" unit designed for future expansion, and 3) buying a mobile home. Households categorized by choice are examined for socio-economic characteristics related to choice and for perceptions of advantages and disadvantages tending to discriminate among choices. The housing type of the respondents' current residences are significantly associated with choice. Two advantages perceived in building by increments are significant discriminators among choice of alternatives: 1) anticipated savings in the cost of borrowing money to buy or build, and 2) possibilities for self-help labor in building.

INTRODUCTION

Obtaining suitable and affordable housing is a serious problem for many individuals and families in the United States. Exacerbated by changes in population and household composition, an unstable national economy and increasing costs of resources, prices of both new and existing homes are very high (Schechter, 1980; McCray, Tremblay, and Navin, 1985).

The single-family detached house (preferably owned) continues to be the choice of an overwhelming majority of American families (Dillman, Tremblay, and Dillman, 1979; Hinshaw and Allott, 1972; McCray and Day, 1977; Michelson, 1970; Montgomery and McCabe, 1973; Morris and Winter, 1978). Many families, however, cannot afford their preferred housing. For those who do purchase their preferred housing, there are indications that considerable lifestyle changes are made in order to attain home ownership. This appears especially true for younger buyers, those with lower incomes and those purchasing their first home (Hinkle and Combs, 1983).

Various alternatives have emerged as families attempt to meet their housing needs as defined by cultural norms. Cooperative ownership, manufactured houses, creative financing, rehabilitation of older units, energy-efficient designs, reduced square footage and fewer amenities are options that some families use. Most of these

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alternatives aim at increasing the affordability of housing, a need that is acute for today's younger generation (Smith, 1981).

BACKGROUND

One alternative, fairly common in the past, but having limited application in recent years, is the concept of extendability. The practice of beginning with a small house and later extending it to gain more space is often an expedient way to meet one's housing needs. Over the years, however, a larger stock of existing houses, changes in building technology and regulations calling for high initial standards have made adding-on a less frequently used solution to housing needs (Rabeneck, Sheppard, and Town, 1974a). Now viewed primarily as a device to make home ownership accessible to those of limited means, extendability could be a viable alternative for many families, especially in times of high housing costs.

By starting with a small unit that provides necessary services and is designed for additions, an extendable house could grow with its occupants as finances permit and as housing needs change. This process of building by increments could enable a family or individual to invest relatively little and spread the construction and related costs over an extended period of time. In addition, extendability could provide an opportunity to design for specific fit, resulting in both increased housing satisfaction and better quality housing stock.

There is very little research concerning the concept or practice of building extendable houses. Most single-family dwellings built today are completed before occupancy with a preconceived design, although this may be accomplished at high initial cost or reduced space and amenities. Wellesley-Miller (1974) states that most houses are built on the basis of lowest possible cost per square foot to keep market prices competitive. The initial low cost is often purchased at the price of high operating costs. One answer is to shift from lowest first cost of the finished structure to lowest possible incremental cost and high terminal value (Wellesley-Miller, 1974). A start-up structure may be built and moved into immediately. Over time, the structure may be extended and new systems incorporated, while older systems are integrated or sold. Eventually, a stable state is reached. The mature dwelling enters a long cycle of tuning, upgrading and adaptation.

Alexander and Jacobson (1974) suggest that any building system should allow the occupant different degrees of participation from total do-it-yourself to contracting out the work with only user-supervision of initial plans. They advocate reconsidering the assumption that buildings should be as cheap as possible, claiming that a building system that enables occupants to create an expensive building over time is needed.

Rabeneck et al. (1973, 1974a, 1974b) describe recent efforts to design housing that is flexible both in design and amenities. Most of those housing efforts, however, have been concerned with large-scale developments and multifamily dwellings. One approach describes design and construction provisions that foster add-on, add-around and add-in extensions of a basic unit (Extendable houses, 1972). The add-on system features a starter unit consisting of a bathroom,

kitchen and living/sleeping areas. It is designed to sell at a price low enough to attract young and low-income groups. Extendability is planned so components readily available from building suppliers can be used within the original framework. The add-in version consists of a finished outer shell with portions of the interior initially left unfinished. Unfortunately, no reports can be found regarding the extent of success of the implementation of such plans.

Critics of the extendable house approach point out that it requires full investment in land, infrastructure and basic services, plus structural over-design, making the first increment expensive in terms of space provided. They claim additional problems may arise when more space is needed since this could also be a time when there are other demands on the buyer's resources or when interest rates and building costs have risen (Rabeneck et al., 1974a). Other housing experts, however, claim that an evolutionary dwelling has a number of advantages over the static, finished building. They believe a primary advantage of the evolutionary dwelling is a financial one. Clearly, there are both advantages and disadvantages to such a process and it would not be practical for everyone.

PROCEDURES

The present study investigates the attitudes of households toward building by pre-planned incremental stages as a way to meet housing needs and aspirations. The research design involved choices among new single-family dwellings only: 1) buying or building a completely finished house, 2) building by pre-planned incremental stages, and 3) buying a mobile home.

The objectives of this study are: 1) to investigate awareness of and interest in the concept of building by pre-planned incremental stages, 2) to study the relationship of household characteristics with choice of building by increments, 3) to discover whether perceptions of advantages and disadvantages discriminate among households expressing preferences for each of the alternatives and, 4) to discover what those perceptions are.

The interview method was chosen for data collection to enable the researcher to acquaint respondents with the concept of building by pre-planned stages. A multi-stage procedure of purposive and randomized sampling was employed, using county maps to identify rural households and city directories to identify urban households for interviewing (Fulwood, 1980). An age limit of 18-55 years for the household head(s) was imposed for respondents included in the study. Households with older heads are more likely to have unneeded single-family structures and/or space (Morris, Crull, and Winter, 1976).

A structured questionnaire preceded by a graphic and verbal explanation of the concept of building in pre-planned incremental stages was used for presenting information and recording responses. For the graphic presentation, four poster-size illustrations with data comparing size and costs of four single-family dwellings were prepared. Two illustrations were of houses that could be built by stages--one through vertical expansion and one through horizontal expansion. One illustration was of a completed house that could be

built all at once and one illustration was of a mobile home. An exterior view, minimum lot size, floor plan and calculated costs for each dwelling were included in the graphic presentation. Costs of the dwellings were based on estimates obtained from four contractor/builders and two mobile home dealers at the time and in the area in which the research was conducted. Costs for each stage of the houses to be built incrementally were calculated on a cost-per-square-foot basis from total cost of the house at completion.

All interviews were conducted during fall, 1979. To minimize interviewer bias, a written description was read. The concept of pre-planned add-ons was carefully explained to ensure that the respondent understood the difference between pre-planning the additions and simply adding on after the house had been finished. Five questions pertaining to prior awareness of and interest in the concept were then asked and recorded before the respondent was shown the four illustrations. A brief graphic and verbal explanation of the alternatives was then given. Respondents were asked to choose one of the alternatives as the better way to attain single-family housing. The alternatives were: 1) building a completely finished house of the desired size and quality, borrowing and/or postponing buying if necessary; 2) building by stages, starting small and providing for later additions to attain desired size; and 3) buying a mobile home. Respondents' reactions to statements of possible advantages and disadvantages of building by incremental stages were then recorded using a five-point Likert-type scale indicating agreement/disagreement with the statement.

RESULTS AND DISCUSSION

Characteristics of the Sample

Approximately three-fourths of the respondents are nuclear families with children living at home and are occupant/owners of single-family, conventionally-built dwellings. Almost half reside in open country or on farms, approximately one-third reside in cities of 10,000-20,000 population and the remainder live in towns of less than 10,000 population. Almost 60 percent of the households interviewed have incomes between \$8,000 and \$20,000, with the \$16,001-20,000 category being the mode. The mode for educational level for both males and females is high school graduate (40 percent), with 22.5 percent having some high school education. Seventy-one households from two counties in Mississippi comprise the sample.

Awareness and Interest

Almost two-thirds of the respondents indicate that they have never heard of nor thought about the process of building a house by incremental stages. Eighty-three percent indicate that they would like to know more about the concept, with 15.4 percent classifying themselves as "very interested".

Choice Frequencies

Following presentation of the illustrations, respondents were asked to select their preference from the three alternatives. Forty-

nine percent of the respondents chose buying/building a completely finished house, waiting and/or borrowing the money if necessary, as their opinion of the better way to attain owned single-family housing. Forty-one percent chose building by pre-planned increments as the better way of the three alternatives, while only ten percent chose the mobile home as the best choice. The extendable houses are a strong second choice both for meeting perceived needs and for affordability. Eighty-three percent of the respondents rank extendable houses second in meeting their housing needs at the present time (76 percent rank the completed house first). Seventy-five percent of the respondents rank extendable houses second as fitting their financial resources. Forty-eight percent of the respondents rank one or another stage of the extendable houses first in financial fit, while only 20 percent of the respondents rank the completed house first in financial fit.

Household Characteristics Associated With Choice

Of the socio-economic characteristics (i.e., family type, income level, education level, race, location of residence, housing type of current residence and housing tenure), only that of housing type of current residence is significantly associated with housing choice. Chi-square analysis and examination of the contingency table reveal that the respondents currently living in conventional single-family dwellings choose purchase of a completed house as their first choice. Respondents currently living in multi-family dwellings are equally favorable toward purchase of a completed house and toward building by stages, but none chose buying a mobile home. Conversely, no respondents currently living in mobile homes choose purchase of a completed house, but are equally divided between building by stages and buying a mobile home.

Although neither income nor educational level are significantly associated with choice of alternatives, examination of the contingency table reveals pronounced variability for respondents in the \$16,001-20,000 income level in choosing building by incremental stages. Another significant variation in the contingency table occurs at the education level of "some college", with those households favoring building by increments by a two-to one ratio over purchasing a completed house. No respondent with this educational level favors mobile homes.

Perceptions of Advantages/Disadvantages as Discriminators

Differences in perceptions of advantages and disadvantages of building by incremental stages among households categorized by their preference for each of the three alternatives are analyzed through Multiple Discriminant Analysis (MDA) to discover which perceived advantages/disadvantages are the best discriminators. As is noted in Table 1, two of the variables are significant discriminators beyond the .05 level of confidence and three others approach significance. The rank order of each variable in ability to discriminate is shown in Table 1 with the F-ratio and probability for each variable given.

The significant discriminators are projected advantages. Both relate either directly or indirectly to financial consideration. Anticipated savings on the cost of borrowing money by building in

stages is the most significant item in discriminating among the three groups. Possibilities for the owner to do part of the work is second in ability to discriminate, doubtlessly related to projected savings on labor costs for building or buying. Variables 1 and 7, "Getting a larger house without having to move" and "Avoiding moving expenses and closing costs" approach significance. They may indicate that a housing process that avoids not only monetary expenses, but the energy, time and psychic toll of moving may have wide appeal. High initial costs of the first stage, neighborhood changes and projected resale difficulties are the poorest discriminators, indicating either high agreement among respondents or high within-groups variability.

Group Means as Indicators of Acceptability

Further indication of acceptability of the concept of building by pre-planned incremental stages may be found in the group means for each of the independent variables. As shown in Table 2, respondents in Group 2, those favoring building by increments, tend toward a positive attitude on all statements of advantages and disadvantages. In a range of 1 (negative) to 5 (positive), this group's means fell below 3.0 only on the statements that additions would probably be needed at a time when other expenses are likely to be heavy and that resale before the additions are completed may be difficult. Group 3, households favoring buying a mobile home, also exhibit positive attitudes toward building by stages, with means above 4.0 for all statements of advantages except those of getting a larger house without moving and ease in obtaining a loan.

High positive scores by all groups, and the highest means for the total, are found for variables 4 and 7, indicating that earlier attainment of home ownership and savings on moving costs, closing costs and refurnishing are perceived as the greatest advantages of building by incremental stages by all groups. All respondents tend to disagree with the statement that the high cost of the first stage, in terms of living space provided, would be a disadvantage. The lowest means for all groups indicate concern for the difficulty in resale of the house before completion as a perceived disadvantage for building incrementally.

CONCLUSION

Data from this study suggest that considerable latent interest exists among households in the concept of incremental building. There are no indications of problems with acceptability of the process of building by increments. Rather, attitudes are generally positive toward the concept by all categorical groups.

Households most likely to choose incremental building as a housing alternative are those perceiving economic benefits from its implementation and those whose current residence is multi-family housing or mobile homes. The pronounced variability in the contingency tables for the income and education variables suggests that families in the lower-middle income group and with some college education find this alternative attractive.

Table 1. Discriminant Analysis Relating Advantage/Disadvantage Variables to Choice of Alternatives

Independent Variables	F-ratio	Rank	P
1. Could get a larger or better house without moving	2.8691*	3	0.0620
2. The size and cost of the house could be increased as income increases	0.8400	10	0.4395
3. Could do part of the work myself	4.6715**	2	0.0125
4. Could purchase sooner since I wouldn't have to save so much for a down payment as for a larger house	2.25122*	5	0.0867
5. May be easier to get a loan since loan amount would be smaller	0.6798	11	0.5146
6. Could save on interest cost since I wouldn't have to borrow so much money to begin building	7.5434***	1	0.0014
7. Could avoid expenses of closing costs, moving and refurnishing usually associated with moving from one house to another	2.6258*	4	0.0779
8. Cost of the first stage, including cost of land, would be too expensive for amount of living space provided	0.3465	12	0.7135
9. Additions would probably be needed at a time when other family expenses would be heavy	1.4893	8	0.2314
10. Choice of location could be limited because of zoning laws, subdivision codes or other regulations	0.9638	9	0.3886
11. Neighborhood might not be a desirable place to live in the future	0.2929	13	0.7512
12. Financing may be more difficult than for a completed house	1.4897	7	0.2313
13. Resale before completing additions may be more difficult than for a completely finished house	0.1701	14	0.8449
14. May have problems with construction and materials	1.5895	6	0.2099

*p <.10

**p <.01

***p <.001

Table 2. Means of Each Group for Each Variable

Independent Variables*	Group 1 ^a (N=35)	Group 2 ^b (N=29)	Group 3 ^c (N=7)	x All Groups
Variable 1	4.2571	4.3793	3.4286	4.0216
Variable 2	4.3714	4.4828	4.0000	4.2847
Variable 3	3.6286	4.5517	4.4286	4.2029
Variable 4	4.0857	4.5862	4.5714	4.4144
Variable 5	4.3143	4.2759	3.8571	4.1491
Variable 6	3.6286	4.5862	4.5714	4.2620
Variable 7	4.3714	4.7241	4.5714	4.5556
Variable 8	3.8286 ^d	3.5862 ^d	3.7143 ^d	3.7097
Variable 9	2.4286 ^d	2.9310 ^d	3.0000 ^d	2.7865
Variable 10	2.5714 ^d	3.0345 ^d	2.7143 ^d	2.7734
Variable 11	2.9429 ^d	3.1034 ^d	2.7143 ^d	2.9202
Variable 12	2.7429 ^d	3.3103 ^d	2.7143 ^d	2.9225
Variable 13	2.3429 ^d	2.1379 ^d	2.2857 ^d	2.2555
Variable 14	2.4571 ^d	3.0345 ^d	2.7143 ^d	2.7353

^aPreference for deferring purchase/mortgaging for a completed house

^bPreference for building by increments

^cPreference for buying a mobile home

^dIndicates that scores were reversed in coding to reflect negative (low score) to positive (high score) attitude toward building in increments. Thus, means above 3.0 on these variables indicate "disagree" with the statement. Range of possible scores is 1 to 5.

* Refer to Table 1 for statement

Concern by all groups with saving on interest costs indicates that this alternative would be perceived more favorably during periods when interest rates are high (rates at the time of this study ranged from 12 to 13 percent). Contrary to the literature, neither the relatively high cost of the first stage in terms of amount of space

provided nor limitations due to regulatory standards are perceived as constraining factors.

Building by preplanned incremental stages is especially appropriate for young adults in the middle-class market. The data indicate that this option is viewed as compatible with space needs and financial resources typical of young families. It appears most appropriate to areas similar to the one in which the study was conducted. Specifically, it would be appropriate in areas having low population density and few building restrictions. Research to further develop the concept of building by increments is needed in the areas of design implications for emerging family types and lifestyles, construction techniques that facilitate adding on and methods for financing houses that may not reach a "finished" state for an extended period of time.

The findings reported here could be useful in beginning a profile analysis of families for whom building by increments is a viable housing alternative. Students in technical school, community colleges, lower-level college classes, apartment dwellers, mobile home residents and young marrieds are suggested as target populations where need and/or interest exist. The degree of interest expressed by respondents indicates a need for fostering awareness of the concept by housing professionals concerned with families and their housing.

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