

A COMPARISON OF SELF-HELP LOWER-INCOME HOUSING
IN COMMUNITY-BASED AND INDIVIDUALISTIC SETTLEMENTS
IN URBAN MEXICO

by

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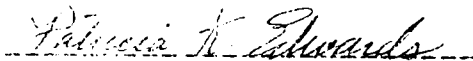
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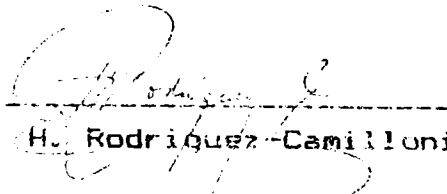
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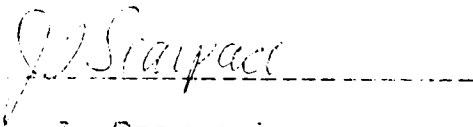
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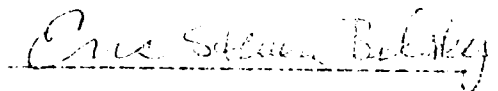
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(ABSTRACT)

This study compares housing in two lower-income self-help settlement types -- community-based and individualistic -- in two contemporary Mexican urban settings: Mexico City and Tlalnepantla. The research investigates differences in housing design preferences of occupant-builders, reflections of these preferences in built environments, and resulting housing consolidation levels.

Of seven elicited housing design preferences investigated, only one suggests statistically significant differences between settlement types in both cities. Community-based settlement respondents tend to prefer an ideology for minimal and equal housing for all; while individualistic settlement respondents, in contrast, focus on individuals' economic problems in securing private housing.

Analyses of the two built environment types show design preference differences reflected in built housing.

In both cities, statistically significant differences

in housing consolidation levels between settlement types occur in the mean, and variations about these means. Community-based settlements had higher means, and had less variation about the mean than individualistic settlements. Their lowest consolidation levels were higher than the lowest found in individualistic settlements.

These findings suggest that community-based settlements more adequately provide lower-income self-help housing for Third World urban populations than individualistic settlements.

The community-based settlement's relationship to the city is different than the individualistic settlement's. Individualistic settlement occupant-builders integrate into the exchange-value economies of the city, and build housing with earnings derived from their variable successes. Community-based settlers integrate differently into the city. They too seek employment; however, recognizing the difficulties of adequate shelter provision within the city, they self-construct housing in a use-value mode outside the city's exchange-value economies.

Earlier studies on inadequate urban infrastructure and housing inferred revolution as a solution (Castells 1980, 1983). In contrast, community-based settlements create no more state-settlement conflict than that generated by integrating individualistic settlements.

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CHAPTER 1.

INTRODUCTION

Third World Urban Housing

Large numbers of lower-income residents grouped together in sprawling neighborhoods often surround the urban centers of Third World cities. These settlements are composed of self-built houses most of which are incrementally constructed by individuals as family finances allow. The self-built house has been studied in the past as a solution to housing the poor in developing cities of the Third World. This study will extend the investigatory field to include urban Mexican community-based settlements.

Community-based Settlements

Community-based settlements are characterized by occupant - builders who organize as a community for land access and to further their collective best interests in housing, urban infrastructure services; and to negotiate with government agencies. Such communities are not regularly prevalent. This investigation takes place in Mexico where there are an estimated 500 legally constituted community - based settlements spread throughout the coun-

try¹. However, other community-based settlements, not formally recognized as such, exist throughout the country².

The most striking characteristic of community-based settlements is the architecture of their housing. In these settlements, all families build their houses together. Replicable designs are used for economical construction. Professional architects, administrators, planners and others work with the community by providing plans and housing designs for self-help construction (UCISV-VER 1990).

The housing designs have a number of strategic architectural characteristics. Replicable designs are used for community-based settlement housing because of 1) the simplicity of repetitious construction by inexperienced builders, 2) the economies of quantity material uses, 3) the architectural efficiency of highly studied rational unit designs, and 4) the powerful symbol of community-based settlement solidarity as expressed by the visual impact of a whole settlement of repeated buildings.

1. Personal conversation with a non-governmental housing organization officer, Mexico City, 1991.

2. Based on personal observations in 1988, 1989 and 1991.

Cursory observations of community-based settlement housing result in the sense that these units appear reasonably complete with respect to construction activities. This observation can be contrasted with housing seen in settlements composed of discrete individuals and families of individuals (called herein "individualistic settlements") where the dwelling finish levels appear to be less finished.

Discussions with community-based settlement occupants, and with architects and administrators who work with community-based settlements, uncover a unique perspective on lower-income housing. The settlers build their housing units as a group with aid from outside sources. The aid is often financial as well as professional services. When building, no one knows who will live in which unit, so all build with equal care and energy. There is no history of exclusion of people from the community because of lower incomes. Community histories attest to the poverty of all of their members at the outset of their building in the city. Housing in community-based settlements primarily reflects a rational attempt to distribute individual efforts through a community organization to provide minimum housing for all.

Such housing units are "owned" by individuals within the settlement, however, the units may not be sold by the "owners" at market exchange-value rates. Rather, all agree to a binding obligation to value the units for occupant use, and to require that they revert back to the community for "sale" to other community members at some flexible use-value rate. This approach can be contrasted with individualistic settlements where occupant - builders are responsible for their own housing, build according to funds at hand, and sell and buy housing according to the free market.

Individualistic Settlements

The community-based housing settlement stands in marked contrast to that most ubiquitous form of lower-income housing in Third World urban environments, the settlement of dwellings of individuals who act singly or as family units in furthering their private best interests in housing. In zones oftentimes called "squatter"³ settlements, they form the dominant mode of lower-income housing in the urban setting. Since the 1950s their growth has been phenomenal. In Lima, Peru, for example, it is estimated that for every 10 houses which exist

3. The term "squattling" is used here descriptively, without respect to legal tenure issues.

within the formal sector, 9 houses exist because of the actions of informal sector actors such as individualistic settlement occupant - builders (Soto 1989). While this form of housing has been highly touted as the most appropriate and affordable solution to lower-income urban shelter needs, it has not been known as a means for producing high levels of finished dwellings. It is not uncommon to find half-built houses and shanties among finished houses, even after 10 or 15 years of occupancy - building. But proponents of individualistic housing point out that this form of shelter provision is responsive to incremental improvements in the well-being of the occupant - builder which are assumed to occur as a surer foothold is secured in the city's economy.

Distinctions

Housing in community-based settlements differ from that in individualistic settlements in two important ways. First, field observations⁴ noted that housing designs in community-based settlements are generally identical replicated designs whereas housing in settlements of individuals typically exhibits designs unique to each household. Secondly, it appears that completion levels of housing

4. Field visits to Mexican lower-income self-help housing settlements occurred in 1986 (6 months), 1988 (2 weeks), and 1989 (2 weeks).

(called herein "levels of housing consolidation") in community-based settlements, when seen on a community-wide basis, appear higher than in settlements of "individualists."

These two distinctions between settlement types "community-based" and "individualistic" bring into question the role of design in the efficient production of lower-income self-help housing. The settlement types stand as contrasting options: in the community-based settlement, people work together for their group's best interest; while in individualistic settlements, each individual (or family unit) seeks her/his own best chances in the economy of the city, and builds housing according to individual successes or failures.

Theory

The differences in housing completion levels and housing form between the two settlement types bring into question the different ways in which the settlements respond to the city in developing nations. Individualistic settlements form important cogs in the machinery of the city where individuals act out their destinies within the city's economies. Their housing reflects their ability to find and profit from opportunity within the city. But as the unit of analysis enlarges beyond the discrete

household to that of the settlement, the question might well shift from "How successful are individuals in the city's economy?", to "How successful is the city in offering economic opportunity to settlement members?"

Community-based settlements are grassroots responses to the lack of sufficient urban support and economic remuneration offered in the developing city. With respect to housing they close the gap between the promise and the reality of the good life in the city. They build self-supportive communities which endeavor to care for all of their members.

This research will theorize that the position of such communities is not entirely within the capitalist city, but positioned at its edge where it not only partakes, as its members can and will, in urban benefits. Additionally, community-based settlement members turn away from the individual pursuit of profit in order to care for their own population. These mutual aid (Singer 1982) actions occur when the developing city turns a blind eye to lower-income population housing needs. This "borderline" positioning between the community-based group and the capitalist city is a defining characteristic of the settlement. Recent researchers see community-based settlements as a new social movement (Friedmann 1984) where individuals gain "emancipation" from the effects of poverty in de-

veloping countries (Schuurman & Naerssen 1990). This research will theorize that such groups form a viable long-term approach to solving lower-income population housing needs through community action. Because it does not threaten the legitimacy of the state this settlement type represents not only a viable option, but perhaps the preferred option for the housing of those lower-income urbanites unable to individually discover a means for adequate shelter in the city.

Summary

As the populations of urban areas in developing cities have grown, investigators have observed the housing activities of lower-income populations. The literature has focused on settlements of individuals as they strove to integrate into the city. Now that community-based settlements are beginning to gain in numbers, the lack of comparative information on these two settlement types requires redress. This research will investigate both the community-based and the individualistic settlement types with respect to housing consolidation levels and occupant-builder design preferences, and actual constructed design differences. The data will form the basis of a theory for

maximizing housing opportunities for lower-income populations in the urban environment while maintaining access to the benefits of the city.

To gain a better grip on the development of housing in squatter settlements, their integration into the city, and the rise of alternative housing forms, a review of the literature in this field follows.

CHAPTER 2.

LITERATURE REVIEW

Individualistic Settlements

Beginnings: Charles Abrams.

Some of the first writings on urban self-help lower-income housing settlements in the Third World date back to Charles Abrams (1964) who investigated, in part, African and Latin American housing. Writing shortly after the close of the Second World War he found that importing technology, methods of construction and cultural mores from developed countries were often economically infeasible or culturally inappropriate.

In Ghana, for instance, he cited the inappropriate advice of European housing consultants who convinced the government to invest in imported precast concrete housing components. These bulky products, created a continent to the north, were costly, unwieldy, and could not seriously address the housing problems of a large lower-income population.

...[P]recast concrete walls poured in Europe were hauled across the seas to Accra's promontory, lowered to rocking canoes, and paddled precariously by intrepid natives past pitching breakers to the distant shore; then they were laboriously transported and set up, miles away, to compose a few lonely exhibits. (Abrams 1964:66)

Rather than seek such solutions from First World experts, Abrams suggested that more effective builders would be native lower-income urban people who, in consonance with government programs, could house themselves through self-help efforts. He observed that "owner-built housing - the earliest form of construction - is still the most common in the world today." But he cautioned that its incorporation into the fabric of the modern capitalist city would require accommodations to the money economy and the division of labor typical of the urban environment.

After the family has bought a piece of land, it waits until it can afford to buy some building blocks. At that time the family may either put up the wall with the help of its members or hire a professional worker or a handyman. The family then may wait until it accumulates enough money for the roof, doors, and windows or can borrow it from friends or moneylenders. The interval between the building stages is usually long, and years pass before the family is in a position to pay for the land and for enough building blocks to go ahead. (Abrams 1964:169).

This utilization of local skilled workers in conjunction with self-help efforts became, in the eyes of many,

a more appropriate solution to the housing of the poor in Third World cities than First World sophisticated design and construction solutions. Abrams added that the local government, too, should be involved by providing programs in support of Third World urban housing policy.

He might well have added other elements of the difficult equation of lower-income urban housing: there should be access to affordable land, government provision of urban infrastructure services such as sewers, water, roads, transportation, and an economy of depth and breadth for adequate employment opportunities.

Mangin, Turner: Observations from the Field, Formulations of Policy.

William Mangin, studying the growing squatter settlement phenomenon in Lima, Peru, reported in 1967 that these groups were not composed of radicals or revolutionary "lumpenproletariat" but were, in contrast, hard working albeit poor members of the city: they only stepped outside the law by invading land to insure a location in the city for themselves. (Mangin 1967). Mangin's response with respect to radicals and revolutionaries was not unfounded because ideologically motivated organizers of the poor did

circulate and squatter settlements with ideologic commitment were founded. In Mexico, for example, the squatter housing settlement¹ Colonia Ruebén Jaramillo located outside of Cuernavaca had a peasant leader, Florencio Medrano, trained in China (Poniatowska 1980). Yet, by and large, Mangin's comment correctly dispelled the fear that squatter settlements posed a threat to the developing capitalist city.

The squatter settlement movement gained in breadth throughout the Third World. Increasingly, an awareness overtook researchers that these settlements were part of the unique development of underdeveloped countries, and that, of themselves, they were not an opposing force in the city. Investigators began to provide tangible evidence that squatters were desirous of integrating into the life of the city. The architect John F. C. Turner, studying housing in Latin America, shared Abrams views that indigenous boot-strap self-help housing was efficient and

1. Settlements, colonias, communities, neighborhoods, barriadas, barrios, are all interchangeable terms used to describe zones of housing in the urban areas of Latin American cities.

productive. And he corroborated Mangin's findings regarding squatter intent.

I have never come across a home-building family in barriadas ...that was not building for their children and that did not also hope and expect their children to achieve a higher social status." (Turner 1967:167).

He found resourceful and successful house builders at work in Peruvian self-help settlements. Individuals incrementally built their housing according to their financial means: house construction paralleled occupant resources and needs. Building sizes increased over time and initial low-cost building materials were exchanged for more durable ones as finances allowed.

Subsequent to his research in Peru, Turner authored works which maintained that housing produced by the state negatively impacted on the availability of lower-income housing because of rigid organizations and regulations. Such housing was unaffordable and usually restricted grassroots self-help activities. Additionally Turner posited that professional services from architects were culturally and economically inappropriate for the poor. He rationalized an approach to lower-income self-help urban housing where the limited incomes of the poor were matched to affordable building materials and self-designed

housing.

In an economy of scarcity, the mass of the common people, though poor, possess the bulk of the nation's human and material resources for housing. Their collective small savings capacity and their collective entrepreneurial and manual skills (and spare time) far surpass the financial and administrative capacity of even the most highly planned and centralized institutional system, whether dominated by the state or by private capitalist corporations. (Turner 1972: 170-171).

Peattie and Salmen: Commentaries on Class Aspirations in Lower-Income Housing.

Peattie echoed Turner's findings on the urban poor's ability to house themselves. Moreover, she observed that lower-income Venezuelans sometimes designed their housing to emulate that of Latin American elites. The poor imitated estate design by incorporating architectural motifs and materials found in the housing of the wealthy.

The cement block house is not only built according to a different principle of construction...but also in style generally follows a different model.... Instead of having a pitched roof overhanging the walls...it presents a vertical facade with a decorative upper edging, often scalloped or ornamented in relief. These decorations are emphasized by color in the painting. ...Another desired touch of elegance is aluminum grillwork over the windows. Such a house is a quintica or poor man's imitation of the rich man's garden- surrounded quinta (Peattie 1968:15,16).

And Salmen, a researcher for the World Bank working in Bolivia and Ecuador, understood lower-income people's

investment in housing as aspirations for successful integration into the developing city. He quotes people as saying, once their houses were serviced by the city infrastructure, "Now we are respectable people (somos gente)."

(Salmen 1987:1) He also observed that the benefits of housing and community development meant more to communities than simply shelter and urban services. He understood that

...these groups were interested in gaining stature, in their own eyes and in the opinion of others as well. Much revolved around the concept of middle class, which in Latin America means something not so different from what it does in the United States: a comfortable house and...living in respectable neighborhoods.... (Salmen 1987:31).

Other investigators, though, posited that the act of building was to produce a product more fundamental to the human condition than class pretensions. Mitchell and Turner saw the self-help process as one of "expressing the culture of the resident" wherein the builder could "employ his ingenuity in the construction of his own home and [this] promotes a sense of dignity....(Mitchell & Turner 1967:11,7).

Development Agency Contributions to Lower-Income Self-Help Urban Housing.

The World Bank, the United Nations, the United States Agency for International Development (USAID) and other First World agencies involved in Third World development utilized the findings of Mangin, Turner and others to inform their housing policy for lower-income Third World urbanites. In a paper for the United Nations, Mitchell and Turner acknowledged the relevance of Turner's perceptions. They noted Turner's belief that "...if left undisturbed with title to property assured, [settlements] will be upgraded to no less than minimum standards by the residents themselves over a period of time." (pg. 6). And they saw this as an enticing approach to solving housing problems in lesser developed countries:

Although squatter settlements are often unsafe and unhealthy, housing policy should recognize that they represent a positive and constructive attitude on the part of the squatter which can be exploited. An attempt to eliminate squatting must acknowledge that squatter settlements at least provide shelter for people who otherwise would have none, or who would be forced to divert their limited resources from programs of economic betterment. ...it should be recognized that a squatter shack is an important way a poor man can capitalize his labor in a labor surplus economy where wages are low. (Mitchell & Turner 1967:5).

As the First World moved to make investments in Latin America as well as other parts of the Third World, they emphasized that capital was to be placed into the production of wealth. Because the World Bank, USAID and other First World organizations had as their aim to promote the capitalist development of Third World countries, accumulating capital for productive investments was critical. The production of lower-income housing, which is a means for self-reproduction and not a means for the production of capital, was not part of the programs for economic improvement. Hence a strong directive developed where the poor were to undertake the construction of their houses themselves with only a minimal diversion of investments from the state.

As [World] Bank financing can only provide a marginal contribution to the total of investment in urban dwellings and services required in developing countries, it follows that for a significant impact to be made, the...[housing] projects must be capable of repetition on a much wider scale without such assistance. (World Bank Paper 1974:3).

Their intent was to "limit the burden on public authorities...[as] any element of subsidy introduced on welfare or other grounds must necessarily be small." (ibid. 3).

Organizations such as the World Bank, USAID and others, consequently, did develop guidelines for legalized lower-income self-help communities. In these guidelines, the logic of site selection, street and infrastructure development were given over to design professionals who better understood technical issues of drainage patterns, efficient lot layouts, water and sewer systems, and so forth. But house building and design was, with a few exceptions, left to the energies, initiatives, and meager capital of the urban poor.

Self-help lower-income housing often proceeds incrementally. Housing expansion through construction (bedrooms, living rooms, etc.) is predicated on surplus income, increases in family size, and/or the desire to introduce family businesses or rental spaces on the building lot. Policy makers and architectural designers evolved a planning/architectural system of housing parts where infrastructure (potable water, electric, sewer systems) was to be connected to small building cores. These cores, in time, were to be expanded to include additional rooms. The intent was to provide critical health-related infrastructure at the outset of the settlement's life. And it was expected that the occupants would continue building shelter spaces as needed and

affordable. (Caminos and Goethert 1978). However even the cost of the core house turned out to be more than First World agencies and lesser developed nations were willing to invest. Subsequently, plans devolved to the provision of infrastructure lines stubbed out for each lot, or for water spigots centrally located for use by neighborhood groups.

While USAID's (and other government agency's) public emphasis was always on affordable housing solutions for the urban poor, there was a coincident political agenda: an emphasis on entrepreneurial opportunities for developing country businesses. In a manual developed by private consultants (PADCO) in Washington, D.C. there was a clear statement that lower-income shelter policy guidelines had, as a basic objective, the obligation to

...encourage and facilitate an increased role for the private sector in the production of low-cost shelter for the low-income population. This includes both a great role for the households themselves as well as private developers and entrepreneurs. (PADCO 1984:3).

Not only was it suggested that local businesses could profit through low-income housing production, but that lower-income households could become profit-takers by building extra space for rental purposes.

Marxist Analyses of Lower-Income Third World Urbanites.

Marxian analyses of the means for self-production are based on observations made during the Industrial Revolution. At that time the economic revolution separated people from their pastoral heritage and brought them to urban factories. Today this condition is not fully replicated in developing urban centers. Yet components of this reality do exist.

Many goods produced through industrial processes are, today, unaffordable to the poor in Third World countries. In part this is not only because of the disparity of incomes between First and Third Worlds, but because goods produced in Third World facilities are more expensive than those produced in old amortized plants functioning continents away. Moreover, in-country capital is often sent beyond Third World borders for highest returns, thus precluding investments in national industrialization. And, to put further distance from the 1840s, industrial work has shifted from industry which utilizes "many hands"

to situations where more highly educated workers control machines which do the work that, in former years, was performed by many.

Lower-income job opportunities in Third World urban areas may well include limited factory jobs, as well as other employment options where, in the classic Marxist sense, there is a relationship of owner capital to worker labor. For example, the sales clerk in a fabric store sells her or his labor and knowledge while the owner derives profit from this activity.

Lower-income housing settlements are populated by a mix of people who are small business owners, street hawkers of products made at home or purchased wholesale, along with a wide spectrum of bureaucrats, self-employed tradespeople as well as employees of diverse businesses. This mix complicates Marxian or Weberian analyses of class.

Weber held that class distinctions are defined by one's economic stratum (Babbie 1977); one's relationship to the market (Collins 1986): Those who acquire more can consume more. Although some evidence of Weber's class theory can be seen at the micro-level within lower-income self-help housing urban settlements, there is little in the way of diversity of groups within the settlements who

exhibit large differences in consumption. A state bureaucrat will have more expendable income than a mason's helper and in either settlement type may have a slightly more consolidated domicile. But in a less than microscopic sense, most all members of the case settlements of this study are approximately equivalent in expendable income.

In the Marxist sense of class, the distinction is focused on those who own and those who do not own the means of production. Those, for example, who own a factory or a colectivo can be contrasted to those who must sell their labor to the factory or drive the colectivo for its owner. This class distinction is rarely discussed within the settlements. Whether because of a lack of consciousness or because the inhabitants have little experience with owners of the means of production, this conception of class is not prevalent. Micro-entrepreneurial enterprises tend to be located in lower income settlements. Typical examples are the home production of specialty tortillas and the leasing of a van as a colectivo where income is offset by lease payments.

With respect to lower-income housing, the class distinctions of Marxian and Weberian analyses are displaced by the elemental dichotomy of those who have -- and those who do not have -- sufficient money for completed housing.

It is a division, not of labor, but of expendable assets acquired by either being an owner of a micro-level entrepreneurial venture (i.e., selling tacos on the street), of having a steady income stream (if, for example, one were a lower-level employee in a state bureaucracy), or of having intermittent income based on seasonal employment. Yet none of these are positioned to acquire sufficient capital for the immediate production of consolidated housing. Lack of capital precludes construction loans and negates the ability of contractors to build structures larger than current income or small savings can accommodate. Furthermore, few systems for capital accumulation and dispersal (such as money lending for small houses) exist in Third World countries for lower-income patrons.

Marxists hold that income received for labor sold should be at least sufficient for "self-reproduction." By this they mean that

...workers must spend the wages received at the end of one period of production to replace their now consumed labour power. They are therefore reproduced in the same position as before, separated from the means of production with only the 'subjective source of wealth', their labour power, to sell. (Bottomore 1983:418).

By reproduction of their consumed labor power is meant more than adequate food and clothing for the next day. It

includes all those necessary components of life: shelter, urban infrastructure services (sewers to carry away laborers' waste, water for laborers' to drink, educational and health facilities for laborers' children to achieve necessary mental and bodily levels as needed to have their own "subjective source of wealth.") Engels expressed this relationship in 1884 as follows:

...the determining factor in history is, in the last resort, the production and reproduction of immediate life. But this itself is of a twofold character. On the one hand, the production of the means of subsistence, of food, clothing and shelter and the tools requisite for it; on the other, the production of human beings themselves, the propagation of the species. (Engels in Bottomore 1983:419).

Castells (1980), theorized that the capitalist mode of production would, because of the competitive profit-drive and the cheapening of products, result in an eventual lowering of prices. He posited that business would not be able support a city's tax base because it meant that remaining profits would be inadequate. This would result in an ever smaller state contribution to the urban infrastructure for the poor. Inadequate provision of water, sewer, road, education, health, etc., would result. With an insufficient income for self-reproduction, the poor would not survive, according to Castells. Workers would rise up against the capitalist means of production and

its servant, the state. Castells predicted urban revolution and a change in the ownership of the means of production.

During the 1960s there were, indeed, numerous instances of urban uprising directly related to inadequate provision of services in lower-income settlements. Governments, were not, however, overthrown. Rather, they successfully manipulated the populace through cooptation. They acquiesced to the poor through small, incremental, provisions of urban infrastructure in which they extracted unpaid labor from the poor to support these public works (Ward 1986). The Mexican government, for example, evolved a system to disperse limited funds rather than resolve formidable infrastructure needs. Their task was to "divide the cake rather than [consider] how much cake...[to] put on the table." (Ward 1986:99).

Grassroots Responses: A Different Approach.

In Mexico, people in individualistic lower-income housing settlements bond only over specific issues which directly impact their lives. Lomnitz focused on this limited perspective, when she wrote that

...[g]roups of neighbors may band together for specific issues; this has happened three or four times in the existence of Cerrada del Cóndor [a Mexico City settlement]. The first time was to request the installation of a public water outlet. (Lomnitz 1974:146).

She goes on to observe that the failure of such community organizations to make demands of the state "merely serve to highlight the absence of any organized effort [on the settlement's part] to solve community problems." Lomnitz did not identify settlements with established long-term organizations. Rather, she found that individuals and families were the primary unit of concern. Thus Castells' model for a major revolution -- one where the state and the owners of the means of production are overturned -- is replaced by individual actions meant to resolve small issues.

The Mexican government defused settlement demands from places like Cerrada del Cóndor. They swept requests for services into a patronage system, so characteristic of contemporary Mexican politics where favors are exchanged for votes and complacency. This government cooptation is a manipulative but important form of containment of lower-income settlers' dissatisfaction with their urban environment. As a prominent Mexican journalist has said, "Any-

thing that grows in my country [inferring grassroots social unrest], the government appropriates." (Poniatowska 1991a).

The government has been reasonably successful in keeping lower-income masses from mobilizing and attempting to overthrow the status-quo.

[It is a system] which makes the poor subservient to, and dependent upon, more powerful individuals. ...resources cannot be demanded or negotiated as of right: they must be exchanged for political support, for good behaviour and compliance.... (Ward 1986:97)

The World Bank, the UN, and USAID understood low-income self-help housing settlements as self-help ways for the poor to integrate into the economy and to access the benefits of the developing Third World city. Abrams, Turner, Mangin, Caminos and Goethert, and others, illuminated a viable if super-exploitative path for the urban poor to walk. And Third World governments, tied to a capitalist world economy, doled out settlement improvements in ways which did not unduly divert tax monies intended for capitalist development.

Pirate Subdivisions and High-rise Apartment Buildings

Self-help squatters do not represent the only housing form intended to solve Third World urban housing shortfalls. Two other options are professionally designed high-rise apartment buildings and the institution of quasi-legal "pirate" building lots. These two were both perceived as options to the lower-income "squatter" settlements. The high-rise was a quickly corrected economic mistake, and the pirate subdivision is a pragmatic free market solution to lower-income urbanites' need for land.

Beyond the prefabrication fiasco of European cast concrete in Africa, Latin American architects, trained in the European rationalist-modernist tradition (Le Corbusier 1967), designed reinforced concrete multi-story apartment buildings surrounded by open greenery. In Venezuela, for example, the Banco Obrero project was designed and built to eradicate a slum area by replacing it with high-rise apartment buildings. But as soon as the apartment buildings were occupied and the old settlement razed, new invaders from the country-side occupied the remaining vacant land. (Turner 1976).

Third World governments quickly became aware of their inability to afford sophisticated 20th century construction. The urban poor were too many. And their meager incomes could not meet debt service requirements demanded by expensive construction and the finance typical of high-rise buildings. High- and mid-rise building projects intended for the poor, such as the multi-building construction at Tlaltelolco in Mexico City, shifted to become housing for middle-income inhabitants.

And urban squatting could not continue for it consumed large tracts of state land, disrupted real estate investments, caused legal problems and occurred without respect to infrastructure locations or capacities. The state intervened to stop land invasions by the poor. Deflecting the poor from the taking of public land, the state turned a blind eye to those entrepreneurs (often termed "pirates") who purchased lands and ignored development laws on subdivision requirements. They sold lots to the poor for individualistic self-help construction (Carroll 1980; Gilbert 1981). Often coupled with bogus land titles and worthless promises of future infrastructure development, the poor built their housing without conflict with the state. In lieu of disruptive grievances typical of squatter settlements, pirate subdivision residents were

coopted into compliant participants in the production of urban infrastructure services and reliable voting records (Ward 1986, Connolly 1982).

Community-based Settlements

Yet one other modification of lower-income urban housing development occurred. In the 1970s in Mexico City, groups of families built settlement housing as a community project. Such groups, though, are not overly common, but they represent a substantially different approach to lower-income self-help urban housing than squatting, pirate subdivisions or expensive state sponsored housing.

Rather, as individuals cast into the capitalist city with uneven chances for betterment, groups of the poor have formed for the purpose of collectively bettering their lives. While the growth of such groups appears to be contingent on local conditions and often, external support, nevertheless their growth is such that it now concerns a number of researchers. Friedman (1984), for example, pointedly identifies these groups as part of a new social movement. And Peter Ward (1991) ponders whether their forms be "atypical". I use the term "community-based settlements" in this study to refer to a specific

form of such communities where settlement members work together as a group for, among other issues, the production of lower-income housing. Other forms than those studied may well exist.

Currently there are no known studies of community-based settlements where the principal unit of analysis is housing. Rather researchers have studied other aspects of community-bonding such as the politics of demand-making to the state, and the economics of the barrio.

Mainwaring (1985, 1986), for example, investigated grassroots political structures in Brazilian lower-income settlements which evolved in response to authoritarian regimes. He found that the popular grassroots movement, Amigos do Bairro, was a neighborhood response to unhearing political structures. Lower-income participants were "concerned with the good of all people, with a better and more dignified existence." (Mainwaring 1985: 7). Mainwaring discovered that urban grassroots Brazilian concern for community equity included the

...popular movements attempt to improve urban living conditions, usually through demands on the state for public services including sewers, paved roads, better transportation facilities, better medical facilities, running water, and electricity. (Mainwaring 1986:3).

But this appears to be no more effective than those Mexican settlement coopted by the state. While he documented that community groups were emerging "as a more conscious, active political force than in the past" (1985:29) some grassroots leaders saw their future more as a partnership with the state. Mexican experiences cast doubt on the effectiveness of this unequal partnership. Nevertheless the Brazilian experience pointed toward "grassroots popular movements...[which are] a significant expression of a more autonomous civil society." (Mainwaring 1986:23). Mainwaring did not discuss if a self-help housing methodology existed to reflect this alternative political structure.

Friedman and Salguero (1987) studied alternative economic structures and life styles in Mexican settlements. And in reviewing the literature, they comment that

Beyond question is the surge of new activities in the barrios of large Latin American cities: a growing capacity for self-organization, self-reliance and self-governance in a process of collective self-empowerment. (Friedman & Salguero 1987:6).

A major hypothesis of Friedman and Salguero is that such activities tend to be dependent upon a lack of employment opportunities in the official economy. And, importantly, they expected that the reverse was true (pg.13). Because

they researched the grassroots economy Friedman and Salguero's investigations did not include housing as a discrete element of analysis.

Friedman and Salguero diagram the organized barrio as a quasi-autonomous organization composed of single and multiple households capable of generating work and trade amongst themselves as well as with the capitalist city. Coupled with a community organization and often aided by external groups such as the Church or foundations, these "communities of limited needs" are able to coexist within and without the economy of the capitalist city (the "economy of infinite wants")².

Paul Singer (1982), investigating the rise of the barrio movement in São Paulo in Brazil, traces its progress from neighborhood groups which, through mutual aid, helped each other until they were economically able to be independent (pg. 285), to the development of "communitarian ways of living which embody the Christian values

2. The sketch "Community-Based Settlement Housing Production in the City" in the Appendix is a modification of their diagram "A Schematic Model of Household Relations." As a theoretical model of the relationship between the community-based settlement and the capitalist city, my modification will be discussed in the chapter on research significance.

of equality and solidarity between all people." (pg. 290). Importantly, Singer found that these groups were not very open to cooptation by local politicians. Rather they evolved the concept that

Their primary objective...[was] to create a new sociability among members of the Community, as well as between these and other members of society. In the final analysis, this new sociability rejects the social relations established by the competitive character of capitalism. The CEBs (Comunidades de Base) cannot accept the persistence and the aggravation of social inequalities. Nor can they accept the idea that inequalities are the result of individual differences, which implies that the poor - because of their ignorance, their low productivity, their inability to limit the size of their families, their propensity to migrate to cities where their contribution to production is less needed - are the principal, if not the only ones responsible for their own poverty. (Singer 1982: 290).

Additionally, Singer addresses the issue of urban infrastructure and the poor. He indicates that the poor seek "what may be called the 'collective goods' of the urban community." (285). Singer did not, however, investigate the housing opportunities present in the new community forms.

Manuel Castells, in The City and the Grassroots (1983), found settlements which organized to protest and, indeed, to revolt against the state because of insufficient urban infrastructure services. In Monterrey, Mexico, for example, workers confronted the state over a lack of

sewer, potable water, and other urban services. But this community did not differ significantly from those others in Mexico who adjusted demands after their needs were, to some extent, addressed. Castells, never investigated housing ramifications of this or other organized settlements.

Lomnitz (1977), as mentioned, showed that neighbors acted with care for each other because it was a part of their economic condition. In a city of underemployment and unemployment, she described their need to share and care for each other on kin-related or neighbor-related bases. Lomnitz's unit of analysis, however, was not the house but rather the inter-relatedness of community members.

And Christopher Alexander, an architect from the USA, undertook to design and construct lower-income self-help housing in a section of Mexicali, Mexico (Alexander 1985). In this venture, he and his team of architects were given access to land and finances, and were given freedom from governmental building code restrictions. Based on a prototype of 5 residences, the Alexander team developed specialized concrete blocks and construction techniques, and they discussed with builder-occupants preferred domi-

cile layouts. The housing units were uniquely configured within the context of common materials and were laid out to form a larger entity of intertwined units. This resulted in common courtyards, shaded zones, and so forth. In so doing, Alexander identified a significant potential for architects who would work toward the housing of lower-income people.

Alexander's work was not, however, produced for a community-based settlement. Rather, it was inserted in a lower-income settlement of individualistic settlers as an example of how an architectural concept might address the issue of lower-income housing. If, indeed, Alexander's work had been incorporated into a community-based settlement, the scale of it might well have been community-wide instead of the mere five units he was able to achieve. It is unclear if Alexander was aware of community-based settlements. It is feasible to consider, though, that his design work could have a favorable impact on community-based settlement designs if the costs of the structures are equivalent to the least cost of more restrictive construction.

This study seeks to close these gaps in the literature of lower-income self-help housing. It investigates lower-income self-help urban Mexican housing production in

community-based settlements and compares these with self-help housing production in individualistic settlements. The differences between the two settlement types' approach to housing form the focus of a comparative research agenda. Prior field research suggested that these settlements' housing appeared to have real differences in building design and in the levels of housing finish (or level of consolidation).

These observations led to the construction of testable hypotheses on differences between the community-based and the individualistic settlements of lower-income self-help urban housing. These hypotheses are the subject of the next chapter.

Chapter 3.

TESTABLE HYPOTHESES

Introduction

Based on observed physical differences between community-based settlements and individualistic settlements, and pilot studies conducted in Mexico City in 1986, it seemed highly likely that housing differed in these two settlement types in the following ways:

1. That owner-builder design preferences in housing would differ by settlement type.

This idea came, in the first place, from unconfirmed commentary by Turner (1976), Peattie (1968) and Salmen (1987) that owner-builders have economic and class aspirations which are expressed in the designs of their domiciles. Secondly, the idea is bolstered from personal observations in individualistic settlements where numerous examples seemed to support Peattie's observation in Venezuela of lower-income emulation of upper-income design housing motifs. Thirdly, observations in community-based settlements indicate wholly different preferences than those observed in individualistic settlements. Here

design preferences appear to be based on the sharing of human and material resources for the whole settlement in a manner resulting in identical housing units. The unit of analysis is the occupant-builder; however, the analyses of this study will group occupant-builders by settlement to understand design preference differences between community-based and individualistic settlements.

2. That the levels of housing consolidation differed by settlement type.

Based on observations in the field during pilot studies in Mexico City in 1986, community-based settlements appeared to have a consistently higher level of housing completion (called "consolidation") than individualistic settlements. But this observation, not being previously investigated, requires quantification and statistical testing. The unit of analysis is the dwelling inhabited by its original occupant-builder. However, the data are aggregated to enable comparison between settlement types.

Hypotheses

These differences are expressed as testable research hypotheses below:

1. Design preferences for housing tend to differ between occupant-builders of community-based settlements and individualistic settlements in self-help lower-income urban areas.

2. The levels of housing consolidation tend to be greater in community-based settlements than in individualistic settlements in self-help lower-income urban areas.

It is further suggested that the tendencies for difference in design preferences will relate to the actual designs of the settlements within which the hypotheses will be tested. Thus a third hypothesis intervenes between the design preference hypothesis and the housing consolidation level hypothesis. This hypothesis links design preference to the real world of the built environment of the settlement, and thus connects the first and the second hypothesis. The third hypothesis is as follows.

3. It is hypothesized that elicited design preferences of occupant-builders are reflected in actual housing designs, and that they differ by settlement type.

Because the three hypotheses test differences between the two settlement types, comparative studies will be the basis for the investigation. With the addition of the last hypothesis, the relationships of the testable hypotheses are represented in the chart below.

RELATIONSHIPS BETWEEN HYPOTHESES

Hypothesis Number	Individualistic Settlements		Community-Based Settlements
Hyp. 1	Housing Design Preferences	<compare>	Housing Design Preferences
	↓		↓
Hyp. 3	Constructed Housing Unit Designs	<compare>	Constructed Housing Unit Designs
	↓		↓
Hyp. 2	Housing Consolidation Levels	<compare>	Housing Consolidation Levels

The method selected to investigate these hypotheses respond to the nature of the settlements in general and to the community-based settlement in particular. They are contemporaneous and in flux, and thus the case study method is used (Yin 1984; Feagin, Orum, Sjoberg 1991).

The hypotheses will infer only to the populations of the specific case study settlements where random sampling

occurs. Generalization to settlement populations is limited to hypotheses where data is quantitative; "translatability" or "transferability" to settlement populations is the mode of inference where qualitative data is utilized in the hypotheses. No attempt is made to infer the findings of the tests to the larger populations of all urban Mexican community-based and individualistic settlements.

Analytic generalizations to theory, though, will be made to these larger populations. Specific differences discovered between the two settlement types based on the hypotheses testing of the cases study areas will form the basis for analytic generalizing to theory in the same way that single scientific experiments relate to theory. For example, the witnessing of an interaction between two compounds when seen in the laboratory might cause a researcher to construct a theory on the relationships between these compounds. Replication of the experiment confirms its validity with respect to generalizability. In the instance of the case studies of this investigation, two urban sites are utilized for the purpose of perceiving differences and similarities with respect to the hypotheses testing and in determining the presence of intervening variables.

CHAPTER 4.

CASE STUDIES

Introduction

The case study method is utilized in the investigation of two settlement types, community-based and individualistic in two urban locations in Mexico: Mexico City and Tlalnepantla. The case study method was selected because the hypotheses 1) are set in contemporaneous, fluid situations; 2) the extent of the populations -- especially the community-based settlements -- are unknown; and 3) the research focus is on theory rather than an attempt to generalize about populations. Case studies,

like experiments, are generalizable to theoretical propositions and not to populations or universes. In this sense, the case study, like the experiment, does not represent a "sample," and the investigator's goal is to expand and generalize theories (analytic generalization) and not to enumerate frequencies (statistical generalization). (Yin 1984:21).

This theory building will be based on the findings of the comparisons between the two settlement types in two different urban Mexican locations.

Locations

Mexico, as a developing nation, was selected as the Third World study site because of personal familiarity, and because previous visits had uncovered community-based settlement activity. Moreover, Mexico's principal urban area, Mexico City, is one of the largest cities on the planet.

In Mexico City, the community-based settlement selected as a case study is the Sindicato de la Cooperativa Palo Alto (called "Palo Alto") (GRES 1985). It is located near the 14 kilometer marker on the major highway connecting Mexico City to Toluca (see the maps at the end of this chapter). The selection of Palo Alto was the result of numerous investigatory forays in lower-income settlements in Mexico City during 1986. As of 1991 the settlement is

approximately 17 years of age¹. The individualistic settlement selected as a case study is Santo Domingo de los Reyes (referred to as "Santo Domingo"). It is located in the southern sector of the City. The selection of Santo Domingo occurred because, in 1986, I lived nearby and because research on housing consolidation levels had been conducted there in the 1970s (Ward 1978) allowing for a comparison of the housing consolidation levels to be determined by this study. As a definable lower-income settlement, in 1991, it was 20 years old.

North of Mexico City lies the industrial city of Tlalnepantla. While it is physically proximate to Mexico City, the travel distance is appreciable and indirect. The community-based settlement which forms a case study is the Unión de Vecinos de La Hospital La Romana (inhabitants refer to their settlement by the acronym "UDEVHOR" as shall I)(Vivienda Cooperativa 1982). It is approximately 15 years old. The companion case study is the individualistic settlement Reforma Urbana de la Blanca (and called

1. Impressions of settlement age vary from respondent to respondent. In some instances people might be at sites years in advance of a squatter invasion. I have reviewed respondents recollections of settlement ages, and rounded them off, while discounting those have been in the area for 30 to 40 years.

"Reforma Urbana"). It is about 14 years old. Both settlements are located in a northern hillside residential section of Tlalnepantla known as Tlayacampa.

While Mexico City is cosmopolitan, with diverse zones and activities, Tlalnepantla is oriented toward industry and lower-income housing settlements. It has a reasonably placid central plaza with older businesses. Housing near the center appears to be middle class. The outlying areas, such as Tlayacampa, are strongly represented by lower-income housing settlements.

Tlalnepantla is a city geographically distinct from Mexico City. I found most respondents unfamiliar with more than general geographic aspects of Mexico City. Even though they lived within an hour or two of downtown Mexico City, they were constrained by the appreciable expense of travel and their preference to stay on their hillside above the travails and complications of cosmopolitan life. They saw themselves primarily as country people who had come to the city in hopes of a better life than the hinterlands offered. The approximate locations of the case study settlements are marked on the sketch map shown at the end of this chapter.

For four months I lived and worked in Mexico City and Tlalnepantla with Ulla, my companion and wife. In the writings to follow all reference to "we" refer to Ulla and myself. My impressions in the following descriptive accounts represent a qualitative perspective of my understanding of the cities and the case study areas. The intent in these descriptions is to communicate my sensibilities of the cities and study areas so that a fuller picture of the settlements might emerge. I also express personal sentiments so that the reader will more fully understand my preferences and prejudices. In this way, the reader might judge my remarks and observations as they might color the research (Patton 1980; Spradley 1979, 1980; Werner & Schoepfle 1987).

The information on each settlement comes from extensive discussions with members of the case study settlements. In each settlement, we visited with numerous respondents and informants. I avoid specific demographic information on the settlements for a number of reasons. Many residents desire to mask their informal sector business activities, and thus avoid discussions about income. Fear of taxation most probably is the central issue of concern. It was also found necessary to avoid conversa-

tions which would overtly explore occupation, education, and specific information on the number of the people living in a domicile. These data were, when I first attempted to gather them, withheld from me as being too prying, or I found that people were embarrassed by their oftentimes lower occupational status. It negatively colored our otherwise open and equal conversation. Prying into numbers of peoples housed in a domicile alerted people that they were asked to divulge information on possible rental space which could negatively impact their taxes. Not fully satisfied that I had no connection with their government, they were sensitive about discussions in these areas. Because conversations in these areas often forced our discussions to become something akin to a formal inquiry, I quickly learned to avoid such talk.

It is unfair, however, to say that I do not have a sense of the settlements' demographic characteristics as made available by observant eyes and attentive ears. I can say that in all settlements there are a small percentage of younger university-trained residents; that there is a small contingent of government bureaucrats, and a smattering of professionals such as lawyers and school teach-

ers. Most members of the settlements, however, work at lower level jobs which are often in the so-called informal economy.

For example, we found numbers of people who repaired automobiles on their own, who worked at home making fancy tortillas for sale on the street, who cooked for people at the vegetable markets, and so on. The educational levels of people more or less mirrored their occupational status: government officials and school teachers were at least high school graduates, informal sector workers tended to have sufficient education for rudimentary reading and mathematics.

Economically, I observed that the higher job holders had monies for automobiles and higher levels of housing consolidation. But I also saw that industrious informal sector workers could also achieve equivalent levels of higher housing consolidation and automobile ownership. Obversely, though, it was seen that those with lower level jobs most often had the more impoverished housing conditions, no automobile, and often strained economic conditions seen in tattered clothes, children without shoes, and so forth.

Oftentimes, we were quizzed about our connection with the government, and who would see the results of our

probes. Because of these concerns which focused on the maintenance of their economic well-being, I did not delve closely into the demographics of the settlements. Even so, there were always several potential respondents who rejected our overtures for conversation out of fear that they had more to lose than common courtesy could allow.

In some instances we had inferences of people renting rooms to others, people who might have clouded titles to their land and/or houses, people who might have businesses within their houses. Because of their commonness, the Mexican government must certainly have a sense for these activities. For my part though, I remain committed to honoring the privacy of the settlement residents.

Restrained from collecting sensitive demographic data, I did focus closely on the housing within the settlements, the history of each settlement, and the personal contributions of the many respondents. A series of detailed and in-depth descriptions of each of the case study settlements and the city within which each is situated follows.

Descriptions of Mexico City, Tlalnepantla, and the Case
Study Settlements

Description of Mexico City

Central District

Pollution and the immense size are probably the most striking features of Mexico City. During the early months of 1991 I started each day by gazing out our apartment window into the distance to see if I could read the advertisement on the side of a not too distant building. If I could not, I knew that day my throat and nose would burn from the contaminants and that a headache was likely. Mexico City's great size, too, can be seen as pollution, but of another sort. Pavement, sidewalk, buildings, traffic, and energetic, bustling, people go on and on for great distances. All of the thoroughfares simmer with the energy of walkers, workers, and traffic. Diversity within this energy is endemic. Major centers cater to sophisticated urbanites seeking imported wines for lunch while a block away tin shed businesses perched on the sidewalk cook tacos and grilled meats for workers.

Vehicular traffic rules this city: streets are race-ways for buses, the worlds' largest fleet of taxis, colectivos², trucks, police cars, and private autos. And while the middle and upper classes would never think to use public transportation, the rest of the people push onto buses and down subway entrances. Seats on buses and the metro are in great demand; here standing up for the trip is common fare.

Lower-Income Settlements

But Mexico City's lower-income settlements -- where houses are incrementally self-built by occupant - builders -- aren't part of this bustling life. Given the growth of the city³, older squatter settlements have been surrounded by the ongoing growth of the city. They are quiet zones. And near the edges of the city, where many housing settlements are situated, the intensity of energy diminishes even more. The differences between the central district and the relaxed, languid atmosphere of these settlements

2. Privately owned van-sized buses running on state mandated routes and charging state proscribed prices are called colectivos or peseros.

3. Estimates on the population of Mexico City vary from 20,000,000 to 25,000,000. The urban area, however, extends much farther than the political boundaries of Mexico City.

is probably no different than a comparison between downtown Washington or Boston and one of their outlying suburbs. Except, of course, that the Mexican people are today much poorer, the houses are almost all self-built, and the condition of roads, power lines, and other city infrastructure is more tentative and less established.

House designs in the settlements to be studied are unique to Mexico specifically, and to Latin culture in general. Usually they have patio spaces, privacy walls along streets topped with jagged broken bottles to deter thieves, steel window frames -- sometimes with bars and decoration -- stucco, and adobe or stone walls. Flat roofs and tropical vegetation are typical. Anomalies exist: among walled housing fronts might be a cardboard shack squatting by someone else's lot; and several lots away, an expensive auto might be glistening behind the iron gates of a well built residence.

Such settlements are often bounded by major roads. As one walks into the settlement, however, the traffic becomes lighter until finally there seems to be an agreement between car, truck and motorcycle that people may also use the asphalt. The tempo of life is in tune with women getting children ready for school, getting out to shop for

food, and starting to cook the mid-day meal. Men and women go off to a job beyond the settlement or work on the house or the car.

Getting to such a settlement (Santo Domingo is a good example) is not difficult, although it might take an hour from the center of the city. It will require travel by public transportation and then a walk down highways and up side streets for several miles. Similarly, travel to the community-based settlement, Palo Alto, (located much further out from the central district) required several transfers within the metro, then a ride on a colectivo out to the edge of the city.

Lower-Income Housing Settlement Inhabitants in the City Core.

But back in the central district, well dressed business people flag down taxis or drive big cars. Six policemen might work the traffic of a single busy street corner while two more with machine guns guard a bank. People meet for breakfast in restaurants where the check is larger than the daily minimum wage. And in the wealthy district San Angel, Porches and antique Aston Martins are for sale. People stroll in and out of "high design" office buildings, meet over espresso coffee at bookstores,

and send their children to private schools where French and English lessons start in the first grade.

Seeing lower-income settlement members within these circumstances requires an eye and imagination because, in large part, there is a transformation from housewife to waitress, from the "don" of the house to the taxi or colectivo driver, the machinist's helper, or the bus "boy". But around 6:00 in the evening, tired, they all crowd onto buses and the metro. You can see them in the twilight as roaring and fuming buses carrying them to the lower-income settlements of the city.

Description of the Community-based Settlement Case Study in Mexico City: Palo Alto

Introduction

Manuel Castells, in the City and the Grassroots (1983), describes communities which rise up against the state when they realize that important infrastructure components for settlement survival are missing and are not being supplied by the state. In Monterrey, in northern Mexico., he discusses a settlement where the inhabitants decided to exclude the state from their community and began to provide their own infrastructure needs. In 1986,

seeking a settlement in Mexico City which, as a community, attempted to solve their own housing needs was fruitless until I came across Palo Alto.

It is near kilometer 14 on the highway to Toluca⁴, and is tucked between a commercial / business district on the highway and a large exclusive upper-income residential zone beyond.

History

Palo Alto began as a work site. During the 1950s and even earlier, the owner of the land hired workers to excavate sand from the cliffs and hills. He sold this sand for construction activities in the city. Seeking inexpensive labor, he found a steady source in the small provincial town of Contepec in the state of Michoacán. These country people accepted primitive living conditions at Palo Alto and welcomed the low paying work. They lived in sand caves and cardboard shacks. At that time, though, this life style and the access to the city was superior to countryside living in Michoacán. At Palo Alto they paid

4. Kilometer 14.5: Carretera Toluca - México.

land rent to the mine owner for their plots of land where their shacks or caves were situated. Sewer and water services were unavailable.

When the land surrounding the site began to develop into upper income private housing for Mexico City's elites, the owner decided to close the sand mines and sell the land as house lots. The workers were told to leave. But the workers wanted to stay in the city. They decided not to return to Contepec or to seek other accommodations in Mexico City. Rather they reacted to their loss of jobs and homes by claiming the land they had worked at for sub-minimal wages as theirs. After a number of violent clashes with armed men in the pay of the owner, as well as government troops, the community was organized by Rudolfo Escamilla (GRES 1985), a Mexican priest identified with the liberation theology movement (Lernoux 1982:465).

Escamilla, as described by numerous residents in Palo Alto, supported the workers' claim to the land and convinced them to seek "dignified" housing for themselves as "dignified people". In time, clashes gave way to negotiations between the squatters, the owner, the courts, and the state. In the end the community purchased the land even though the courts had awarded it to them because of the owner's default in the court system.

Physical Layout

Palo Alto's site planning and unit designs are the work of architects and planners associated with Escamilla. The housing units are, except for later additions, identical. Most have the same form, white paint, and dark window trim. They sit side by side. The planning differs substantially from the normal variation of housing styles, level of finish, and diversity of finishes usually found in a Mexican housing settlement of individuals.

Here, instead of the Latin design paradigm of privacy walls sealing the environments of individual houses, it is possible to look through curtained windows into living rooms. Additionally, the patio space of each house is partially visible from public walkways.

The design is derivative of minimalist housing plans from the architecture of Europe during the 1920s. These rationally constructed plans were evolved by architects instrumental in the founding of the critical Congrès Internationaux d'Architecture Moderne (CIAM). The architects largely responsible for the initial formulation of minimalist housing include Ernst May, Walter Gropius, Le Corbusier and Sigfried Giedion. All, in 1929, at the

second meeting of CIAM, were involved with the "Housing for Minimal Existence." (CIAM 1933, Frampton 1980).

While I can argue that Le Corbusier's influence was strongly felt in Brazil and other countries of South America's southern cone, and that Uruguayan architects worked on the designs of Palo Alto, such efforts are beyond the scope of the current investigation. Nevertheless the rationalist approach to architectural planning is critical in the housing of Palo Alto. This is relevant to the research since aspects of the study compares these rationally produced housing units with houses individually designed and built by their occupants. But the analysis will not focus on plan or specific design. Rather the research will investigate design preferences of occupant-builders and the levels of finish (consolidation) of the houses.

Site Plan

The typical Mexican street, domain of the automobile, truck, taxi, bus and motorcycle is transformed in Palo Alto. There are no through roads. Rather, most streets are designed specifically for the pedestrian.

The site is good for economical building. After the mining operations the land is flat and the remaining soils are sand. Moreover, the community has natural boundaries of cliffs toward the highway side, and scrub low lying hills to the west. Toward the elites, are cliffs. See the map at the end of this chapter.

Organization

Palo Alto's residents come from humble backgrounds. They make a point of remembering their past as a way to be proud of small accomplishments and to remain vigilant against those who would devise ways of taking away their land and buildings. They have active community organizations which include a president, vice-president, treasurer, a vigilante committee president, and so forth. They continue to have on-site worker brigades to produce concrete building block for new construction.

Ownership

The settlement is owned by the community of occupant-builders as a cooperative. It is the first legally recognized housing cooperative in Mexico, and has been used as a model by others. The land is not divisible, although

individual housing units are placed on defined lots. It is possible for a house's occupant to leave the settlement, but the house may not be sold for profit.

Certain settlement members who have been economically successful in the city are currently attempting to convince others to disband the organization, to move out, and make profit from the sale of the houses. This desire, however, is effectively countered by a strong majority of settlement members who recognize that the non-profit aspect of their housing grants them and their children access to housing⁵.

Description of the Individualistic Settlement Case Study in Mexico City: Santo Domingo.

Introduction

The colonia⁶ Santo Domingo (Santo Domingo de los Reyes is its full name) was researched by Peter Ward in the 1970s (Ward 1978). In this work Ward describes a classic

5. Many of the original resident's children wait for the opportunity to build and to live in the settlement. There are more children than space currently planned for future housing.

6. Neighborhoods in Mexican cities are known as colonias.

illegal land invasion by paracaidistas⁷. The land had been governmentally held, and in the 1950s it was at the edge of urbanization.

While Ward's description of Santo Domingo inhabitants as paracaidistas seemed plausible in the literature, the case study area selected within Santo Domingo presents a somewhat different population. Many of the people had special rights to lands in Santo Domingo because of their previous connections to the community of Los Reyes. Plots of land were deeded to them as comuneros, or people with a communal claim to the land⁸. Yet some are paracaidistas and still others purchased land plots and sometimes buildings from either disenchanted or profit-taking early settlers.

7. The term paracaidistas refers to illegal squatters. The English translation is "parachutists." This word is used to describe the way in which squatters appeared on land they invaded. Because of their secrecy in organization, they appeared to casual observers to come there "all of a sudden, as if dropped from the sky."

8. Native inhabitant lands were held communally by people of geographic areas. This system of land holding was fractured by European conquest. A component of the Mexican Revolution was the acknowledgement of this right, and the institution of a mechanism for granting to natives title to ejidal, or agricultural, lands (Grindle 1988: 58). Santo Domingo residents hold that comunero rights are similar to ejidal except that they refer to nonarable lands.

According to residents, other areas of Santo Domingo are more heavily populated by paracaidistas. Some comuneros, at the edge of the case study area, described shooting pistols into the night to discourage nearby paracaidistas from invading their area. Nevertheless there are numerous instances in the case study area where invaders successfully occupied the land.

Description of the Area

Santo Domingo is located in the southern part of Mexico City. While it was originally vacant land at the City's edge, today it is surrounded by urban growth. Several blocks of housing in Santo Domingo were selected for the case study area. This area is composed of four streets which are bounded on the top by a business street and on the bottom by a residential street. Because of anonymity requirements, only a general description of the area is given.

The land has a decided slope downward toward the west. The slope is intersected at right angles by the grid of the streets which were built with a north to south slope for road and future sewer drainage. But the roads were built without respect to the lay of the land. Consequent-

ly, when going behind the privacy wall of some houses, it is necessary to take a ladder down to the house, or sometimes the original part of the house is found built in a depressed area of a lot that has over time been filled to bring it up to street grade.

According to original settlers the site was forbidding for construction because it was a tangle of lava rock mixed with cactus, scrub brush, and snakes. And water sources while in the area, were rare. So forbidding was the land that local legend has it that Zapata's forces felt safe hiding gold in the deep lava crevices during the Mexican Revolution.

The area is almost wholly residential, but there are occasional small stores, bodegas, intermixed with houses. The residences are of many designs and sizes, and in various states of completion. Occasionally there will be a house with an open grilled fence, but family privacy and security, being highly valued, are behind solid walls built at the edge of the roads. Most houses are one or two stories high.

Current Activity

During the work week, the study area verged on emptiness. The few men at home were unemployed or worked at night. A number of women stay at home to maintain the households. In the afternoon, some houses which were otherwise unoccupied, had middle school or high school students at home.

On the weekends, the number of cars and trucks in the streets increases. People walk towards markets with goods for sale (woven mats, grilled meats), others sell candy on the street, and yet others work on their taxis or peseros. Children play in groups, and families leave the colonia with net bags for shopping in the vegetable markets of the city.

Description of the City of Tlalnepantla in the State of Mexico

Introduction

North of Mexico City are valleys where trains and winds get in and out of the capitol. In one of these valleys lies the city of Tlalnepantla. Just over the boundary line of the federal district which comprises Mexico City, Tlalnepantla is in the adjacent State of Mexico. Colloquially shortened to "Tlalne" by locals, it is an industrial city several hours north by transport from Mexico City's center.

A trip into Tlalnepantla from Mexico City involves travel through the northern part of Mexico City. Large zones of factories give way to a small section of middle-class government mid-rise apartment buildings and then one arrives in the center of Tlalnepantla. Here is a colonial church, a formal central plaza, zócalo, and a series of historic roofed but open masonry arches, Los Arcos, which define the historic district. To the east of the center is an open market area where streets are crowded with

merchant booths. Clothing, audio tapes, tools, vegetables, guitars, used books, fruits, belts and shoes, and more are all available at arguable prices.

Beyond the market looms a large traffic circle, a glorieta, which functions as an informal transportation center for the outer reaches of Tlalnepantla and other towns reaching into the more northern state of Querétaro. There are no bus stations or signs in the glorieta. Rather a hidden rational system of bus locations and departure times exist. As you learn your way around, segments of the system are revealed by frequent bus users and drivers. And, in time, the appearance of chaos gives way to an understanding of the unstated yet dynamic order of this transport system. It is the transport system we used to visit the case study areas.

Northward beyond Tlalnepantla's center is an enormous industrial zone of steel fabrication plants, oil plants, chemical plants, and other heavy industrial undertakings. While these factories dominate the valley floor, the hills and mountains to the east are home to thousands of lower-income families. Several miles out of Tlalne is a hillside area known as Tlayacampa. A colectivo ride up Tlaya's mountainside has stops at the center of the district (a small market area and a few necessary stores) and

then numerous stops -- on call -- in residential areas. As the bus near the end of its ascent, high on the mountainside, it comes to UDEVHOR, a community-based settlement. Yet further up, well past the last bus stop is the colonia Reforma Urbana, an individualistic settlement.

Description of the Community-Based Settlement Case Study in Tlalnepantla: UDEVHOR: Union de Vecinos de Hospital La Romana.

Introduction

We knew from Palo Alto residents that a sister community-based settlement -- they called it "La Romana" -- existed north of Mexico City. Its location, however, was difficult for them to describe and transportation routing was unknown. For over a month, in between research trips in Mexico City, we searched for "La Romana". It took four trips to find it. It's proper name is the Sociedad Cooperativa de Vivienda Unión de Vecinos Hospital La Romana, called by its residents UDEVHOR for short.

History

During the 1960s, the state undertook to construct a new hospital just north of the historic center of Tlalnepantla. To be called Hospital La Romana⁹, it was never built because by the time the concrete columns for the first floor were finished the site was invaded by paracaidistas. Shacks were leaned onto reinforced concrete columns and the construction site became a squatter settlement. In time, the state pressured the squatters to relocate because the land, located within walking distance of the historic center of the city, was now to be used for government offices and schools.

Hospital La Romana squatters organized to discuss relocation. After some vacillation -- including competition among caciques¹⁰ -- they received a visit from the priest Rudolfo Escamilla. Some decided to create a self-help community-based housing settlement. They agreed to

9. The location is in the colonia La Romana of Tlalnepantla.

10. A number of people have made livelihoods from representing the poor of squatter settlements. Usually offering their expertise in negotiating with the state, these leaders, or caciques, were often not from the settlements - nor were they necessarily looking out for settlement occupants. Variations ranged from the ideologically biased to pseudo gangsters.

work with Escamilla. They found two land parcels in Tlayacampa suitable for their needs. Negotiations with the owner followed, with the city participating because of a desire to vacate the La Romana grounds. A site for housing was settled upon and purchased with the aid of the city and Escamilla.

The city, however, did not favor a community-based settlement of La Romana residents. As an enticing option to La Romana squatters, the city instigated development of land farther up the Tlayacampa mountainside. Individual lots were offered for sale at below-market prices. Because of this offer only a fraction of La Romana residents opted to participate in the community-based settlement.

Following the Palo Alto model, the La Romana community-based settlement group worked with design, administrative, and construction professionals. Designs were evolved and work groups organized. Fifty dwelling units were planned for construction. As in Palo Alto, the plan was to design all the residences in an identical manner, to have all the people work together, and to select housing units for family occupancy by lottery after the build-

ing shells were completed¹¹. Because of government pressure to vacate the hospital site, temporary housing had to be found for the house builders. Quickly constructed housing units of cement floors, concrete block walls and cement asbestos roof panels were erected on site for this purpose. After the 50 shells were built, families finished the insides of their houses as individual circumstances allowed.

Problems, however, beset UDEVHOR. Once house units were in place, few took part in cooperative work parties such as making additional automobile parking spaces, creating an internal park for children, or picking up trash. Of the 50 housing units built, today only 29 are currently owned by people who helped build the community. These 29 actively support the community and the community-built housing concept. 20 other units -- representing a sizable 44% of UDEVHOR's current population -- house occupants who were invited by the UDEVHOR group to move in¹².

11. Building shells, called obra negra (black work), were rudely finished. Interiors were exposed block, rough concrete floors, and exposed brick ceilings. There were no interior doors, electrical wiring came from the outside to the house panel and stopped, and plumbing facilities were occupant responsibilities although sanitary lines were in place.

12. The 50th unit is a settlement office.

They were primarily solicited to help finance obligations which UDEVHOR had undertaken. These residents are, essentially, individualistic settlers who found affordable housing in a community-based settlement. The majority of the dedicated community-based settlers, however, maintain a strong if not fervent organization.

The Site

The UDEVHOR site is steep mountainside. There are three lines of attached housing units. Additionally the site contains a number of mostly unused temporary housing units which were built to house the settlers when they left the La Romana site. While the rest of Tlayacampa is public street with privacy walls separating houses from the public, UDEVHOR is surrounded by a community wall which is easily penetrated. Everyone's housing unit is viewable.

Housing Unit Design

One housing unit design is replicated throughout the settlement. The selected design fits the steep contours of the site. It is a three level structure with entrance

to a living room at mid level. Half a flight of stairs down is a kitchen/dining level and a half flight up are two bedrooms.

Description of the Individualistic Settlement Case Study in Tlalnepantla: Reforma Urbana de la Blanca

Introduction

The individualistic settlement site in Tlalnepantla, like UDEVHOR, is partially populated by occupant-builders who left the Hospital La Romana site. They elected to take advantage of the city's offer of inexpensive housing lots.

Our discovery of the settlement was a combination of chance and sharp ears. We had earlier attempted to study a site down the hill from UDEVHOR but it posed serious problems because of large numbers of overt drug users. Our quest for a companion site to UDEVHOR was solved while talking to UDEVHOR residents who said that some original members of the community-based settlement had gone up the hill. So we, too, went up the hill.

Reforma Urbana plots were offered to La Romana residents as well as to illegal squatters camped in the hills

of Tlayacampa. The city used the settlement not only to weaken the community-based settlement, but also to regularize other lower-income settlers. The city designed streets, laid out lots, and promised people electrical, water and sewer services, and paved roads. The cost of the lots were minimal.

While the residents acquired inexpensive and tenured lots, they learned that infrastructure development depended on their labor in conjunction with city engineering and materials. Today many residences have connections to a city sewer system, have piped water coming to their lot's edge, and have electricity¹³. And they paved the street. Now that the infrastructure work is complete, people function independently of each other. While occupant-builders may be friendly with neighbors and have strong comadre and compadre¹⁴ relations, they tend to focus inwardly toward their families.

13. Some impoverished households, however, are not connected to sewer and water lines. One resident told me that their family simply dumps sewage waste onto the street in the night.

14. Strong inter-familial affiliations based on god-mother and god-father relationships are not unusual in Mexico.

Physical Description

Reforma Urbana is mountainside. Roads have very tight curves and steep slopes. Buses do not go up these roads because of their steepness. It isn't unusual to see a car attempt a difficult stretch of steep road two or three times before climbing the slope. Houses are built either up-hill or down-hill of the roads. Down-hill units build one, two or more story structures at the street line with an additional story below or have steps or a precarious walk down to the back of the lot. Up-hill units often have stairs going up a full flight before a platform can be leveled off for a floor.

Sewage lines, depending on gravity flow, informally cross neighboring properties or run parallel to the street. Water lines run down-hill from the large city-owned cistern located above the settlement. Because of erratic water service, some houses have constructed private cisterns for a steadier supply of water.

House Description

The housing units vary from a few very primitive cardboard shelters to multi-story reinforced concrete and stucco buildings. The more rudimentary structures were

wooden posts holding up scrap lumber framing on to which was fastened bituminous-impregnated corrugated cardboard and scrap tin¹⁵. Usually a dirt floor, a single light bulb on a thin extension cord, and a curtain for a door round out such a house. In such circumstances, the only furniture would be several beds and a cardboard carton as a "dresser".

While this describes typical initial construction for most all of the lots, most do not today have remnants of this first house. Usually this structure has given way to a concrete floor, followed by concrete block walls. In time the roof was removed and a concrete reinforced slab poured. All of these improvements are incremental and dependent on surplus capital for material, as well as labor if it must be purchased.

Those houses which are at higher levels of construction and completion have stuccoed walls, sometimes brightly colored. A few include shrines to the Virgin of Guadalupe. Buildings might also include a series of bedrooms,

15. A nearby, much younger settlement is almost all built in this manner. While it will improve over time, some members of Reforma Urbana jokingly refer to this area as cartonlandia.

a balcony, a dining room, etc. The individual designs reflect differences in opinion on how a family wants to live on the mountainside.

As noted in the text, sketch maps of Palo Alto in Mexico City as well as UDEVHOR and Reforma Urbana in Tlalnepantla follow. In order to gain some geographic sense of these communities, a sketch of the nation of Mexico showing principal cities is included; a map of Mexico City, the State of Mexico and environs which locates Tlalnepantla; and a map of Mexico City and Tlalnepantla with each of the four case study settlements generally located. This map also indicates the general limits of urbanization in relation to the political demarcations of Mexico City and Tlalnepantla. The maps are located in the Appendix.

CHAPTER 5.

RESEARCH METHODS

Introduction

Field research at all four case study sites utilized quantitative and qualitative methods to investigate the research hypotheses. This chapter will describe methods used, followed by information on variations to these methods which are unique to specific case studies.

Issues in Qualitative Research.

Qualitative research differs from positivistic quantitative research in a number of ways. Research hypotheses in qualitative research, for example, may not necessarily be formulated prior to undertaking field studies. If pilot studies do not preface field research, hypotheses typically evolve as part of the field research. And the methods of collecting data may not readily fit to the operationalized structures associated with quantitative work. Rather than the restrictive nature of questions

created prior to field work, the qualitative researcher might probe respondents through open-ended questions and observation. Such is the case of this investigation.

Major ways in which this study utilizes qualitative research are participant observation (Spradley 1980), ethnographic interviewing (Spradley 1979), and content analysis (Miles & Huberman 1984). While not necessarily a unique component of qualitative study, the case study (Yin 1984) is the method utilized for this investigation.

Issues in Validity and Reliability.

Because qualitative methodology differs from quantitative methods, some have posited that these modes reflect different research paradigms (Lincoln & Guba 1984). There are researchers who find the use of quantitative research terms such as "validity" and "reliability" unacceptable in qualitative research and offer new terms which, they propose, should be used to describe qualitative research's different but similar requirements. "Credibility" is offered as a counterpart for validity; and "trustworthiness" for reliability (Lincoln & Guba 1985). And Kirk and Miller (1986) propose that reliability can be de-

scribed as three different types: diachronic, quixotic, and synchronic; and validity can be defined also in three different ways: apparent, instrumental, and theoretical.

However, Goetz and LeCompte (1984), proponents for qualitative research, create definitions of qualitative research which form a bridge between the methodologies. They reformulate the positivistic definitions for validity into two: internal and external, and also two for reliability: internal and external. Generalizability, for them, is a term similar but different to that associated with quantitative methodology.

To bridge the gap between the two methodologies, brief definitions of validity and reliability accepted for use in quantitative research are given, followed by Goetz and LeCompte's qualitative definitions. Because the ethnographic material of the case studies are presented in a naturalistic manner without reference to reliability and validity issues, the qualitative definitions described herein indicate conformance of the study to qualitative criteria.

The positivistic definitions associated with reliability, validity and generalization follow:

Internal Validity. According to Babbie (1983), internal validation is "the process whereby the individual items composing a composite measure are correlated with the measure itself."

External Validity. External validity is the "process of testing the validity of a measure, such as an index or scale, by; examining its relationship to other, presumed indicators of the same variable" (Babbie 1983). Yin (1984) succinctly states that it establishes "...the domain to which a study's findings can be generalized."

Face Validity. The Babbie (1983) definition: "That quality of an indicator that makes it seem a reasonable measure of some variable."

Construct Validity. Defined by Yin (1984) as "establishing correct operational measure for the concepts being studied."

Reliability. Babbie (1983) defines reliability as "[t]hat quality of measurement method that suggest that the same data would have been collected each time in repeated observations of the same phenomenon."

Generalizability in quantitative research allows for the random sampling of a population and, within the potential for error in the statistical analyses utilized, the generalization of the finding to the defined population. Babbie (1983) defines generalizability as "[t]hat quality of a research finding that justifies the inference that it represent something more than the specific observation upon which it was based."

Qualitative Research

Given the growth of the naming of different kinds of reliability and validity in qualitative methodology, it is quizzical which of the competing collection of qualifiers to utilize. Because of the cogency and conciseness of their presentation, the Goetz and LeCompte (1984) definitions are used, although general descriptions of qualitative research forwarded by Lincoln and Guba (1985) are also included.

Reliability in Qualitative Research

Reliability in qualitative research poses insoluble problems to researchers wholly subscribing to quantitative methodology. How can field research, wherein individual

respondents and researchers converse in open-ended talks, and with observations of the flux of contemporaneous events ever be replicated? It is, as Lincoln and Guba (1985) relate, that no river can ever be crossed twice because the river's waters never cease to change; the river's identity is forever new: it can never be revisited.

Any attempt at replication, then, would result in the generation of different data. The response of qualitative researchers to this dilemma has been to sufficiently describe the research so that the reader, had he or she been there, would agree that they, too, would have reached the same conclusion if they had been, in fact, the researcher (with his or her acknowledged foibles and biases), who undertook the study.

For the reader to acquire an understanding by which to judge reliability, it is important to know not only the things said and observed, but to also know the makeup of the researcher as it reflects on the research. The intent is to be able to separate from the findings those biases which the researcher did not (or could not) separate from the research. Geertz's "thick description" (as cited in Lincoln & Guba 1985:125) gives credibility to the ethnography in these tasks. In-depth, thick, descriptions of

the research and the circumstances with which the researcher met, aid in the production of documents of the studied reality. The reading of this reality must be sufficient to create a sense of "reliability" or of "trustworthiness" so that the reader believes that had he or she been the researcher that they, too, would have come to the same conclusions.

As any researcher of the social sciences working in the environment of the subject is unlikely to be clad in a white coat in a controlled laboratory setting, so too, the "human-as-instrument" (Lincoln & Guba 1985) researcher undertaking qualitative research is not white-coated. He or she has a unique personality, has ideological and other preferences, has acquired tastes, and so forth. To deny these human characteristics is an attempt to contract this "human-as-instrument" into an impossibly passive position. Biases must not, of course, occur which would color the research; but acknowledgement of biases which aid in the description of the researcher only aid the reader in assessing the reliability of the research.

Validity in Qualitative Research

The terms internal, face, construct and external validities are subsumed, reformulated, and rephrased to reflect the differences between quantitative and qualitative research. Goetz and LeCompte (1984) rework and modify the basic terms of validity and reliability into two parts each: internal and external. Each such part, though, has numerous responsibilities. In the descriptions of validity and reliability to follow, I include concrete examples of where the study meets these required conditions in its ethnographic investigations.

Reliability.

"Reliability refers to the extent to which studies can be replicated" (Goetz & LeCompte 1984:211).

External Reliability.

Would "independent researchers...discover the same phenomena or generate the same constructs in the same or similar settings"...?(Goetz & LeCompte 1984:210) External reliability, according to Goetz and LeCompte (pg. 214), is enhanced through attention to five potential problem areas:

1. Researcher Status Position. The issue here is in identifying the researcher's relationship to those studied. "The dependence of ethnographic data on the social relationship of researcher with participants requires that research reports clearly identify the researcher's role and status within the group investigated." (Goetz & LeCompte 1984:214) continue to inform that "conclusion reached by ethnographers are qualified by the social roles investigators hold within the research site." (pg. 214).

Efforts to respond to this criterion are contained within the study in the following ways:

A) My approach to respondents is through random selection or accepting the total population of a settlement. No respondent was selected because of researcher preference;

B) I am a clear outsider: a foreigner accompanied by a foreign companion, my wife. We presented ourselves as from the USA with an interest in lower-income self-help housing. The visiting of a married couple eased access to those female respondents who were alone in their domiciles.

C) My social relationship with respondents and informants varied per settlement according to the opportunities

uniquely present or absent in each. For example, in UDEVHOR the sharing of family meals was not uncommon and the sharing of soft drinks the norm at most interviews. And in Reforma Urbana, curiosity about foreigners often resulted in relaxed and open conversations. In Santo Domingo, by way of contrast, their experience with door to door salespersons created a less open attitude toward our work; requests for interviews were often rejected. In Palo Alto, our relationship with the settlement hierarchy is documented, and descriptions of a selection of random visits is included.

2. Informant Choices. Here the issue is that other researchers would, if they were to replicate the study, have access to the same or similar respondents and informants. "This threat to reliability is handled most commonly by careful description of those who provided the data" advise Goetz and LeCompte (pg. 215). The study provides descriptions of key informants, and describes respondent selection as random in Santo Domingo, Reforma Urbana, and Palo Alto (given their definition of their legitimate community-based settlement members - a self-imposed purposive sample); as well as the whole of UDEVHOR's population of similarly described legitimate community-based members.

Because over 100 respondent interviews were conducted as part of this study, textual descriptions relate to typical protocols and to important differences and commonalities.

3. Social Situations and Conditions. The concern here is to adequately describe the social contexts and circumstances under which data were gathered. Some contexts could impede and/or color responses. For example, in UDEVHOR, I describe that all visits to respondents were in the company of two settlement elders; while in the other settlements there were no accompanying guides. These elements are discussed in the text, as are other situations which could impact on the study. For example, a female respondent in Palo Alto was initially uncomfortable with the interview because of a crying (and hungry) child. It was considered at first that she would not be a useful respondent because of the disruption. Once her child began to feed, however, I became convinced that her attention was focused on the interview. Descriptions of such contexts and conditions form part of the text.

4. Analytic Constructs and Premises. "Constructs, definitions, or units of analysis that informed the original research" (Goetz & LeCompte 215) should be understood by

readers. An explanation of the research genesis and development forms part of the study.

5. Methods of Data Collection and Analysis. Goetz and LeCompte (pg. 217) would have researchers "specify methods of data collection and analysis" so that the text could, in effect, be a manual for those who might consider replication. The text contains descriptions of how data were collected on heuristic elicitation exercises, housing consolidation levels, and settlement housing history. The analysis of design preferences and housing consolidation levels is described in detail to meet this criterion.

Internal Validity.

The requirement for internal validity quizzes the researcher on whether "multiple observers agree" (Goetz & LeCompte 217). The concern is that the single researcher may be too idiosyncratic for others to accept the research, may not undertake research at different sites in the same manner, may record data in a less than diligent manner. "Ethnographers commonly use any of five strategies to reduce threats to internal validity" (Goetz & LeCompte 218):

1. Low-Inference Descriptors. Here the focus is on a

rich reporting of data collected in the field. This includes not only supportive data but also "reporting any negative or discrepant data." (pg. 218). Those texts which provide reader with rich data, "...multiple examples from field notes; they generally are considered to be the most credible."(pg. 218). This study attempts to satisfy this requirement through the incorporation of data, reports of conditions and conversations, and the utilization of salient examples. Given the large number of respondents, however, it is not feasible to richly describe each and every respondent and associated environment.

2. Multiple Researchers. It is suggested by Goetz and LeCompte (1984:219) that an excellent guard against threats to internal reliability would be multiple researchers. But it is admitted that such cases are rare because of funding restrictions. In the case of this dissertation it is even more restricted since the work is, by its intent, that of a single author. Nevertheless, as my wife accompanied me to all interviews, we did have many opportunities to informally discuss respondents, informants, and responses.

3. Participant Research Assistants. Goetz and LeCompte advise (pg. 219) that "[m]any researchers enlist the aid

of local informants to confirm that what the observer has seen and recorded is being viewed identically and consistently by both participants and researcher." This format is followed in this study at each settlement site where informants are retained to review respondent historical accounts, meanings associated with the heuristic elicitation exercises, house building and consolidation issues, and overviews on other issues. Selections of confirmations and/or rejections of critical researcher observations by informants are included in the text.

4. Peer Examination. Three methods of peer examination are suggested by Goetz and LeCompte (pgs. 219-220):

- A) The integration of descriptions and conclusions from other fieldworkers in their presentations;
- B) Cross-site validity checks are possible when multiple sites offer potential for independent generation or confirmation of results; and
- C) Peer review at publication.

This study does not have other contemporaneous fieldworkers. It does, though, in the portion of the study dealing with housing consolidation, make correlations to a previ-

ous study in Santo Domingo by the English geographer, Peter Ward (1978). And, being a multiple-site study, there are suggestions of commonalities between the two community-based and the two individualistic settlements in elements of the history of how respondents went about housing themselves, on housing design preferences, and in housing consolidation levels. These are all to be found in the text. Peer review by publication, obviously, is not currently possible.

5. Mechanically Recorded Data. According to Goetz and LeCompte (pg. 220), data collection relying on such mechanical means as cameras, audio- and video-tape recorders, enhance reliability. Photographs were taken of houses in different settlements and are included in the text. The photographs are used for reader correlation to the author's descriptions of levels of housing consolidation so that readers may agree or disagree with the data; and to document the diversity of housing designs within individualistic settlements and the continuity and repeated designs found in community-based settlements. The audio-taping of conversations was expressly rejected at the outset of the study because of the threat it contained in accessing suspicious respondents and settlements.

Validity.

If, reliability, as Goetz and LeCompte, suggest, can be a major threat in qualitative research, then validity, they say, is its major strength. This is because the methods of data collection and the interviews between researcher and respondents and informants are couched not in conceptual categories of the researcher but in the spoken reality of those interviewed; and because participant observation is occurring in the natural setting.

Internal Validity

Goetz and LeCompte (pg. 221) define the problem of internal validity succinctly: "...do scientific researchers actually observe or measure what they think they are observing or measuring?" There are five areas to be addressed for threats to internal validity:

1. History and Maturation. The issue here is time. There is no control for time: when research takes place over a lengthy period changes can occur. This study addresses this issue by having a limited duration: a desired concept according to Goetz and LeCompte. The other issue of history and maturation was the sequence in which settlement research occurred. The Mexico City settlements were studied in a more or less simultaneous manner. After

the conclusion of these research endeavors, the investigation moved to Tlalnepantla where UDEVHOR was first studied, followed by Reforma Urbana.

It could be of concern that different research protocols could have threatened interval validity. To offset this, the investigatory procedure remained constant because there existed a protocol for respondents from the beginning: discussions on historical aspects of settlement creation and housing development, the heuristic elicitation exercise, and the inspection of the domicile for consolidation levels. This resulted from the results of the pilot study and the resulting research agenda. No major deviations occurred.

A yet further concern would be the occurrence of a major historical event which would color responses. An example would have been the 1985 earthquake. The major historical issue during the time of the study was the war against Iraq which had begun before the research commenced. There was little in the way this event intervened to threaten internal validity.

2. Observer Effects. The potential threat to internal validity here is that the researcher might expand respond-

ent views and comments beyond the intended context. The control suggested is to seek out individuals who would be representative of the population. The study had random sampling as part of the research protocol except in UDEV-HOR where the whole population was interviewed. Another issue is that people might say to the researcher what they believe the researcher would like to hear. Yet another issue is differing relationships between respondents / informants and the researcher. "In essence," state Goetz and LeCompte (pg. 225), "researchers must guard the instruments they use and the constructs they create from their own ethnocentrism and perceptual biases."

This study's construction was purposefully designed to avoid such threats by -- with respect to heuristic elicitation exercises -- having a methodology which did not solicit specifics nor sought to expose what it wanted to know: why the respondent like/dislike a particular housing design. Rather it was constructed as an open-ended elicitation process which utilized the principal rapport of "What is it about [the particular aspect of a building's design] that you like/dislike? The avoidance of the directed question: "Why is it that you like X? affords distance from the threat that respondents might simply give an answer which might be perceived as pleasing the

researcher or simply to complete the interview. "Why" was never part of the conversations. The construct, of course, also kept researcher ethnocentrism at bay because there was no space for suggesting preconceived responses. Lastly, the process of informant review of respondent commentaries provided a means to corroborate the researcher's understanding.

3. Selection and Regression. The issue presented by Goetz and LeCompte (pgs. 225-226) with respect to the issue of the selection of those respondents within community-based settlements was dealt with in a manner which focuses on those members of such settlements who subscribe to the settlement's community-based tenets: are they accepted by the community itself as members?

The research makes comparisons between the two settlement types. While this research could have taken into account the inclusion of discontented members of each settlement type, its intent was different: it was to discover differences according to design preferences and housing consolidation levels. This was accomplished -- at leadership demand in both community-based settlements -- with only those members of these settlements who fully participated in the community. Those wishing to derive exchange-value remuneration (Palo Alto) for their resi-

dences or those who had not participated in the building of their houses (UDEVHOR) were excluded.

The selection of respondents was random at all locations except at UDEVHOR where the entire population (of original house builders -- a small number) was interviewed. Because randomization allowed for quantitative generalizations to the specific settlement populations, the selection of the whole population of UDEVHOR negates inferential statistics to the settlement itself.

4. Mortality. This threat to internal validity has to do with the "ways in which groups change over time as a result of losses and gains in membership..." (Goetz & LeCompte 1984:226). It is a particularly acute problem for those ethnographers who lose subjects and must replace them. For this study the issue is moot because of the short time period.

5. Spurious Conclusions. The focus here is that the relationships posited may not be causal but could be spurious. The ethnographer's response (Goetz & LeCompte 1984:227) is that "[a]lthough no research design can identify the precise cause of an observed datum, ethnographic data may be quite effective in specifying an array of the most plausible causes and designating from among them the

most probable." This, in fact, is what the study does with respect to data derived from the open-ended questioning and probes associated with the heuristic elicitation methodology in Chapter 6. Data are sifted and organized into different grouping of similar responses. Responses are reviewed with respect to their orientation, and are closely evaluated for assignment to particular groups.

External Validity.

Goetz and LeCompte (pg. 221) define external validity as the issue of the extent to which "abstract constructs and postulates generated, refined, or tested by scientific researchers [are] applicable across groups." They believe that "threats to external validity ...consist of those effect that obstruct or reduce a study's comparability and translatability." This study, however, makes no claim to generalize to a larger population; rather it focuses on analytic generalization to theory (Yin 1984). It generalizes to a model.

1. Selection Effects. The concern in selection effects is that the "researcher mistakenly has chosen groups for which the construct does not obtain." (Goetz & LeCompte 1984:229). Which, in the sub-ject matter for this inves-

tigation, would require that the community-based and/or the individualistic settlements were not as purported to be. Yet this threat is controlled by the historical information received from respondents and informants that the settlements do indeed correspond to their respective categories.

Each and every respondent was prequalified by their positive response to the query of "Did you build this house?" for individualistic settlements and "Did you take part in the community building which resulted in this housing?" in community-based settlements. And, as previously mentioned, community-based respondent selection excluded those inhabitants who were not considered by the community-based leadership to be members: those who had not participated in house construction (UDEVHOR) and those who wished to exchange their domicile, as private property, on the open market (Palo Alto).

2. Setting Effects. Setting effects concern the threat to external validity from actions of the researcher. "Simply by studying a group, culture, or setting, the investigator affects it in some ways." (Goetz & LeCompte 1984:230). This threat can never be completely removed. Because the heuristic elicitation exercise utilized in this study was vulnerable to this threat, it was con-

structured so that the vocal input of the researcher is benign. The questions asked revolve around the following: "What is it about X that is [liked / disliked]?" This format kept the investigator from, as previously mentioned, asking the question which would have colored the setting: "Why is it that you like this?" Such a question could have a respondent thinking up reasons for liking something to please the investigator.

Another aspect of the setting effect is "oversaturation." Communities accustomed to frequent visits by researchers would, according to Goetz and LeCompte, devise strategies for dealing with researchers. The settlements in Mexico City appeared to have more experience than their Tlalnepantla cohorts in dealing with salespersons, but not with investigators. No evidence came about to suggest oversaturation.

3. History Effects. "Cross-group comparison of constructs may be invalid because of the unique historical experiences of groups and cultures," advise Goetz and LeCompte (pg. 231). However, in this investigation, the unique historical differences between groups are important. Learning about them is part of the research agenda. The study text describes the historical background of each

settlement, and discusses differences. As a caution, Goetz and LeCompte suggest that consideration of each group as totally unique is another concern: there may be many commonalities. In the study this was found to be true. For example, there are many shared experiences between the two community-based settlements, and between the two individualistic settlements. And, in some instances, there are commonalities between a community-based settlement and an individualistic settlement: for example, the HEM analyses show sometimes very similar responses to the urban environment. The text exhibits and discusses instance of shared and unique characteristics in both design preferences and in housing consolidation levels.

4. Construct Effects. "Construct validity...refers to the degree to which instruction for and formats of instruments are mutually intelligible to the instrument designer, to the instrument administrator, and to the participants to whom the instrument is applied." (Goetz & LeCompte 1984:231-232). The only instrument offered to respondents was the HEM exercise wherein they looked at the four offered photographs and made responses. The acceptance and understanding of the instructions of "What it is that you see in the picture of the house that you like, or

dislike" was typically quick. But there were times in which it did not appear to be understood. In these instances the responses were muddled and confusing. Such unclear answers were immediately suspect, and I repeated the instructions again. Oftentimes, the respondent's relatives also reached into misunderstanding and offered -- along with my repeated directions -- their voices on how to proceed. In only one instance did I find a series of responses which I believed to be based on serious misunderstanding. In that instance, I disallowed the results for the study. This instance can be found in the Santo Domingo responses where all the responses are labeled as "inconclusive."

In addition to the issues of validity and reliability in the ethnographies of the case studies, two other areas of concern are participant-observation and generalizability.

Participant-Observation.

Spradley (1980) describes five different levels of participation: complete, active, moderate, passive, and non-participation. Because of the short length of the

study, the higher levels of participation -- complete, active, and moderate -- were not possible. The level of participation involved in the four settlements, described herein as "hanging out" in the communities, corresponds to Spradley's phrase of being a "loiterer." As described in the text, we spent considerable time in each settlement acclimating to and learning about the environment. In doing this we observed while walking about, drinking at local bodegas, chatting with people on the street, etc. We also spent time inside many people's residences where we observed the level of consolidation, discussed settlement history and the building of the house or houses.

Generalizability.

As mentioned, the concept of generalizability in qualitative research varies from that where positivistic methodologies are used. Inferences to larger populations for generalizations are, as noted, limited to the specific four settlements studied in this investigation. Those issues dealing with design preference, based on qualitative research, are not generalizable even within the settlement population. Rather, as qualitative material, they represent, because of the nature in which the data were collected, opportunities to "transfer" or to "trans-

late" to the settlement populations. The method of data collection, the detailed material developed, and the method of analysis all "provide sufficient information about the context" (Lincoln & Guba 1985) to strongly suggest transferability, the qualitative research correlate to generalizability.

Where broad generalizations are made, they are made to a theoretical model for a form of lower-income housing settlement. In this instance, as posited by Yin (1984), the form of generalization is analytic; that is to say that the findings are not to populations but to theoretical constructs. Goetz and LeCompte (1984) prefer to use the term translatability as more appropriate for qualitative research. They seek demonstrations of the typicality of the phenomenon. The research however does not seek to translate the findings to a larger population to which typicality is to be confirmed. It is the definition of Yin (1984) which is most appropriate when discussing these broad generalizations. The text will distinguish between theoretical generalizations and generalizations to settlement populations.

General Qualitative Research Methods

"Hanging out" in each settlement was an important, qualitative research method. This activity will be described below, but it generally follows the descriptions given by McCall and Simmons (1969), Patton (1980), Spradley (1979, 1980), and Werner and Schoepfle (1987). A major limitation to full incorporation of the literature was that no attempt was made to fold in, to be part of the community: to be a camouflaged "participant observer." Cultural differences, language, size, skin color all were identifying marks of us as foreigners.

The "hanging out" form of participant-observation qualitative research is utilized with other components of the research in a "triangulation" (Denzin 1978) of data, thus aiding in increased validity. While the qualitative approach, "hanging out", differed from settlement to settlement, some of the salient features included the following:

1. Frequent visits to a settlement for 20 to 30 days. These days were typically spread out over 2 to 4 months as visits were often interspersed among the different settlements.

2. All visits were with my companion and wife, Ulla. As a relaxed foreign couple we walked leisurely around the settlements, seeing buildings, stores, people; enjoying views and small chatter with settlement occupants. We eventually developed a "teasing" approach in individualistic settlements where we would conduct a number of "look and leave" excursions. Usually, by the third visit, curiosity had the better hand and many residents' wanted to know who we were, and what we were doing. We usually had no problem making casual acquaintances but we chatted tangentially about our research interests. In community-based settlements, the same leisurely strolling was productive. However, it was necessary to first contact the community's power structure in order to present our credentials, explain our investigation, and receive approval. Not infrequently, community-based settlement residents checked with settlement officers about our mission.

3. In short time, we struck up general and specific conversations with children and adults in tiny neighborhood stores (bodegas) and on the streets. These were introductory chats about diverse subjects; but they also included commentary about the strength of the people to erect their own houses, the way some buildings were finished and others weren't. These conversations made our

presence in settlements less stark, and aided, later, in gaining access to people and their houses. However, the success of informal conversing varied from place to place, from street to street, from bodega to bodega.

4. When most everyone in a settlement area was accustomed to our presence and understood our interests, we often photographed representative housing units and people in the settlement. Returning with these photographs for distribution in the settlement engendered informal conversations, and opened opportunities to converse about settlement history, houses, construction, to hint that we would like to see houses and patios, etc. It began a reciprocal process of giving and receiving.

5. We brought gifts of fresh fruits, vegetables and coffee to valued informants, selected respondents as well as to those whose financial and family circumstances seemed precarious. Such gift giving is patently a Mexican way of expressing friendship without dwelling on concern. We always made such presentations without any connection to questions, requests for access or other aspects of the study.

The second form of qualitative methodology closely follows the above description of "hanging out". Talking

with informants and with respondents typically involved relaxed conversations (often at length with informants) in people's houses or sitting on rocks in their patios. These talks were always open-ended and, at our behest, dealt with housing, the construction and design of housing, the history of settlement, conflict, government infrastructure, community organization, and other housing related issues. Such unstructured conversations were noted in journals and have been selectively utilized by incorporation in the study¹. In return, we unstintingly described our life in the hilltowns of Massachusetts, talked about our children's lives, made clear our attitudes about the US-Iraq war, etc. This equal exchange made our visits more of a cultural exchange and consequently, in some settlements we were guests to oftentimes laboriously prepared dinners.

Every respondent and informant of this study was given a promise of anonymity. This was, in some instances, critically important for gaining access. Many people were very protective of what they had acquired -- legally or otherwise -- by way of shelter, building materials, land

1. Because of the specific nature of the notes, these journals are not part of the documentation.

tenure, lot size, plantings, etc. While most felt reasonably secure, there was concern that my questioning could turn into something harmful. Some people felt that giving out information could turn to their disadvantage if the government knew of their modest comfort. In any event their concerns for secrecy are respected. No one is specifically identified. All data have been mixed so that no findings or statements can be attributed to any one individual or family. All house numbers used in the research have been mixed and are fictitious.

I asked about anonymity at community-based settlements. I asked if they wished to have their settlement's names and locations masked. They emphatically requested that I publicize their names, locations and accomplishments. I have done so. However, I have maintained as much individual anonymity as possible.

Heuristic Elicitation Methodology (HEM) Qualitative Research

A form of qualitative research entitled heuristic elicitation methodology (HEM) (Harding 1974; 1979) is used to investigate Hypothesis #1². It investigates design

2. See the chapter on testable hypotheses for a description of each research hypothesis.

preferences of case study settlement respondents through elicitations.

Hypothesis #1. HEM: Design Preference Differences

Approximately 30 randomly selected occupant-builders from each settlement participated in a heuristic elicitation methodology (HEM) (Harding 1974, 1979). This research method consisted of a series of conversations and investigatory probes devised to discover the underlying rationale of a respondent's expressed preference for house design attributes.

Randomness was developed in three settlements by numbering the houses within the portion of the settlement selected for study. House numbers were written on paper slips which were folded, placed in a jar, and picked for house selection. In one settlement, such randomness was not allowed. In yet another settlement, random sampling was reviewed by officials of the settlement before interviewing, to exclude anti-settlement members. Specifics will be discussed in the sub-chapters devoted to each settlement.

In the HEM exercises, respondents were shown four black and white snapshot photographs of houses taken in Mexico City in 1986. These are in the Appendix as docu-

ments 6 (HEM photographs 1 and 7) and 7 (HEM photographs 29 and 30). These photos were part of over 50 shots I had in my possession. The selection, by me, of the four photographs was random to the extent that I arbitrarily selected them from my collection³. These same four photographs were shown to all HEM respondents in all four case study settlements. When shown these photographs, respondents were encouraged to express their "like" and "dislike" for any design element in the picture. By asking, through a series of iterative steps "what it was" about the selected element of the photograph that was liked or disliked, a statement of underlying preference was eventually elicited. The process normally took four to five iterations before an underlying design preference was stated.

Each respondent was shown, in no special order, each photograph. At each photograph the question was asked, "What is there about the house you see in the photograph that you like or dislike?" If the answer was slightly evasive (not an uncommon occurrence when first starting with a respondent) or if the response was a general, "I

3. Both Sontag (1978) and Rubenstein (1981) discuss the subjectivity of all photography. In order to diminish possible effects of cultural bias in the exhibited photographs, I requested at the outset of the research that informants discuss with me any unusual aspects of these pictures. None were reported.

like this house," then I would seek more specific responses by saying, "Oh, you like it. Well, I'd like to know what it is about the house that you like." The response, then, (with perhaps people scrutinizing the photo more closely) might have been, "Well, I like the facade." I would retort, "And what is it about the facade that you like?" And an answer might be, "Well, it seems like a very traditional facade. It reminds me of the facades in the highland parts of Mexico."

I would further probe, asking "What is it about traditional highland facades that you like?" and the response might be "I like the traditional architecture of Mexico." If, after repeated further probes, I discovered that the responses were doubling back to the idea of a traditional aesthetic, and that there was nothing underlying "tradition" such as a desire to return to the countryside or to live in a style like a ranch owner, then I noted that the underlying design preference was "traditional aesthetics".

There were many respondents and informants who gave single responses to each photograph. But there were also many who evoked profuse commentary. When we worked with a family, it was typical that everyone had opinions. Sometimes, too, a husband and a wife would give different responses ("I like this place because I can let the kids

play outside without watching them" versus, "I don't want to live in a place like this, it is too large for one family") I would take each photograph at a time and go from wife to husband with the elicitation exercise. Elicitation exercises always started out with enthusiasm, but responses require concentration and commentary, so after talk on the fourth photograph was concluded, there was always a sense of relief that it was over.

The data came from individuals who were identified as builder-occupants of their own houses. The data from these individuals within each case study was collected in groupings where the unit of analysis shifted from the individual to, in the aggregate, the case study settlement. These data were then content analyzed to form preliminary groupings of design preferences. Later, a compression of the preliminary groupings into 7 final categories allowed for statistical analyses on a settlement to settlement basis.

I met with informants to casually converse about the kinds of responses being generated through the HEM exercises. The thrust of these conversations was to determine if my understanding of the responses was correct or culturally biased. For example, an expressed desire to have

a house "like a hacienda" always seemed to me to have a desire for upper-class mobility, but informants (as well as the respondents themselves) consistently corrected me: it was the style of the house they liked, and not, emphatically, the attainment of wealth or power. Such informant reviews allowed for an increase in confidence with respect to the validity of the research (Yin 1984:38).

The research agenda combines qualitative and quantitative data to operationalize other testable hypotheses.

The following commentary describes the quantitative research.

Quantitative Research Methods

At each of the randomly (or otherwise) selected domiciles, when allowed, I undertook an inspection of the level of housing consolidation.

Most families indicated that they themselves had built their house (individualistic and community-based settlers) or that they had contracted parts of it out to neighborhood craftspersons (individualistic settlers). In no instance did anyone indicate that their extended family took part, en masse as a family unit, in the construction of the domicile or that the pooled income of family members allowed them to complete their house while other,

smaller families, had less consolidated houses. In certain instances I was able to observe that family sub-units undertook their own consolidation actions without contributing to the consolidation of portion of the household held by other family members.

Hypothesis #2. Housing Consolidation Levels.

In most instances, the respondents of the design preference (HEM) hypothesis allowed an inspection of their domicile for the housing consolidation level study. There were, though, some instances where people responded to HEM exercises on the street in front of their house or in their living rooms, but were unwilling to allow an inspection of their house. While expressions of untidiness, impending business or baby-feeding schedules were typical reasons given, it was almost axiomatic that such a response meant an unwillingness to allow an inspection of the house.

In each house to which access was allowed I judged each space seen⁴. The number of excluded spaces was minimal, estimated to amount to no more than several rooms

4. There were instances where I was excluded from certain rooms because the spaces were in use or for other, unknown, reasons.

for every 5th house evaluated. The exterior was also evaluated. The method used to evaluate house consolidation levels follows.

Description of Methodology

Each space (Sleeping Room, Kitchen, Toilet Room, Living Room, etc.) was judged according to the following components of the space:

floor

walls

ceiling

doors

electricity

plumbing fixtures (if applicable).

Each component had a theoretical minimum of completeness of 0 (it did not exist - for example, if there was a door opening but no door) and a maximum of 10 (it was completely finished). As an example of judging, a concrete floor showing substantial cracking, if when investigated turned out to be no more than a few centimeters thick would receive a rating of 1 or 2. A floor of smooth and solid concrete with carpeting or a tile floor would receive a 10. Walls and ceilings were similarly judged. Doors were judged slightly differently. If

there was a steel or a well-made wooden door it usually rated a 10. If there was a less substantial door made of, say, plywood it might receive a 5. Curtains in openings received a 1.

Electricity was judged to be in one of three different levels. If there was none in the space, then a 0 was scored. If there were ceiling outlets from which thin extension wires ran to various lights and fixtures, it received a 5. Fully wired spaces utilizing wires in internal conduit⁵ received a 10.

The plumbing fixtures judged were water closets (toilets), lavatories (sinks) and showers. In the kitchen, a sink was expected. Often there was no sink so a 0 was scored. Sometimes the sink had a sewer connection but no water supply. In this instance a 5 was scored. Similarly, in bathrooms a water closet, lavatory and shower were expected. If a fixture was not present a 0 was scored, if it was in place but only connected to the sewer, a 5 was given, and if it was with a sewer connection and a water supply, a 10 was scored.

5. Typical construction provides flexible plastic tubing in walls and ceilings for wire conduit.

The exterior of a house had a maximum potential value of 200. I judged each residence as falling somewhere between 0 and 200 (completely finished). The 0 - 200 range reflects relative costs of the exterior when compared with the 0 - 50 range for individual interior non-plumbed rooms.

The values of all judged components, for each space, were summed up. The total value for spaces with water usage (i.e., kitchens, toilet rooms, wash rooms, bathrooms) was doubled to reflect the customary rule of thumb among architects that such spaces were more difficult and expensive to build⁶.

The judged consolidation values for all spaces in a living unit were summed up and compared to the optimum, full consolidation value. A percentage was then computed to compare the differences between these two values. The charts at the end of the housing consolidation level chapter show rating for rooms, and levels of consolidation for the housing units.

6. Not only was this true with respect to the provision of sewer, cold and hot water lines; but also because higher quality floors, walls, ceilings, and doors are needed to withstand moisture. For example, walls in a living space might be entirely adequate and complete as paint on plastered cement block, but in a bathroom a tile surface or an enamel paint would be a more appropriate (and expensive) finish.

Informant Affirmation of Findings in Housing Consolidation

As I gained a sense of variations in housing consolidation levels within a settlement, I would discuss these levels with several informants to see if they agreed with my findings and if they could add depth to my understanding, and to increase the construct validity of the study. Typically the conversation would be couched in an informal discussion where I would introduce such comments as, "Julio has a beautiful bathroom, with blue and white tiles. I haven't seen much of this. Much more common are painted cement walls...." The informant might advise me that, indeed, not too many people had tile bathrooms, but that the cement ones work well and are much more affordable. Thus I was able to determine from multiple sources the range of finishes and their relative costs.

Photography

So that the reader has a means to judge consolidation levels for him or herself, a selection of photographs of rooms and exteriors of selected houses are found at the end of the chapter on housing consolidation levels. I was

able to photograph both of the Mexico City settlements, but comments in Santo Domingo convinced me that further use of the camera would negatively impact on the study⁷.

In Tlalnepantla's UDEVHOR, I undertook a different, less direct strategy. Here I photographed families as, in part, a gift for letting us come into their houses. With the camera in use within the house, it was not untoward to ask permission to photograph selected conditions. In Reforma Urbana the settlement posed a higher risk for robbery than previously experienced, so we traveled only with a notebook. Perhaps as a consequence of not taking pictures, our access rate to houses was higher than in Santo Domingo. On our last day in Reforma Urbana, however, I brought the camera to photograph houses from the street. I made no effort to intrude into the houses, and no one offered that we come in for photography.

Correlation of Housing Consolidation Findings with
Previous Research

Additionally, since Ward (1978) had in 1973 conducted a study of housing consolidation levels in Santo Domingo,

7. Unfortunately, I had become known as one who photographed people's living rooms, bedrooms, and toilet rooms. Once I discovered this, I quickly decided that I had enough documentation and refrained from bringing the camera in the settlement.

I was able to compare my final findings with his published results. This comparison, included in the chapter "Analysis of Housing Consolidation Level Investigations" provides an additional level of validity to my study by the comparison of data.

Hypothesis #3

Here photographs of the build designs, as allowed by research constraints, are utilized for an analysis supplemented by conversations with informants and respondents. In this work I focus on visually correlating respondent expressed design preferences (Hypothesis #1) and consolidation levels (Hypothesis #2) to photographic evidence of the actual built environments.

Case Study Conditions

A brief description of the unique conditions, constraints and opportunities each settlement presented for research follows. The intent is to offer a limited background sketch of our relationship with the settlements, the informants and respondents.

Variations caused by settlement demands and circumstances can alter qualitative data; and restrictions on random sampling can limit opportunities to make inferences

to populations (even though such is not my intent). In my judgment the variations to be described do not materially affect the research. The greatest variation in qualitative methodology occurred in UDEVHOR. However I view this variation as an improvement on the methods used in the other three case studies. If anything, there should be an increase in qualitative data production from UDEVHOR, yet I judge it to be similar to the others in all aspects except for the consistently pleasant access we enjoyed with UDEVHOR respondents.

The community-based settlements restricted respondent interviewing to, in Palo Alto, members in good standing with the settlement; and in UDEVHOR to original occupant-builders. Both restrictions, I hold, enabled us to prequalify our sampling.

In Palo Alto, those members who espoused a desire to convert their domiciles into cash according to current exchange-valuation were excluded from the sample because they no more reflected the essence of the occupant-builder of a use-value oriented community-based settlement than a group of use-value oriented builders in an individualistic

settlement would be representative of these occupant-builders. To have included these aberrations would have colored the research⁸.

In UDEVHOR all original occupant-builders were included; anyone else was excluded.

8. The test against a use-value oriented community-based like approach to housing within individualistic settlements was controlled by my receiving from each respondent a history of their house building.

Research Methods at Santo Domingo de los Reyes

Background

In 1986, I walked into Santo Domingo and spent several weeks sketching and taking photographs of the houses in the area which is the individualistic settlement case study area for Mexico City. I met several people, watched construction, discussed the historical development of the area, and tested the heuristic elicitation method of research on a number of people.

Informants

For the field research of 1991, I started first in Santo Domingo. I met with an informant I had known since 1986. We had numerous discussions on the history of the colonia, the development of the immediate area, and the building of his family's households, and those of adjacent friends.

Within a short time, he directed me to another informant who was an original member of the colonia. Neither of these informants had an interest in escorting us to random sampled respondents, although they reviewed the list and suggested the removal of several households (these house-

holds were not original occupant-builders, but people who came later). Yet another informant was the son of an original settler in the area, and was intimately familiar with the development of his family's houses, the houses in the neighborhood, and the folks of the neighborhood. He enjoyed taking us to visit respondents. His mother, who remembered much about their days of initial building, was also an informant.

The first informant was a business man in the informal sector. He regularly set up a stall at an outlying market to grill meats and cook sausages. By most standards in the settlement, he was in the upper-middle portion of income earners. His work produced enough income to support a pick-up truck, send his kids to religious school, and put a stereo and TV in the living room. The second informant, as a school teacher, was substantially less well off. His family of 5 lived in an adobe one room building which functioned as kitchen, living and sleeping space. However, his family was in the process of building a new two-story house of concrete block for this mother. To make all of this happen the took on extra work at school, and worked for a political organization.

Yet other informants were the wife and son of a construction supervisor who was part of the first wave of

people into the area. Their lot contained two houses and they owned the adjacent lot on which they had constructed a rental apartment building.

With each informant I discussed the history of the colonia and the history of houses in general and the houses of some of the respondents. Sometimes I walked the streets with informants listening to their commentary on the houses. This method, however, was not I felt, perceived as endearing to the neighborhood because there were always curious people listening to us and I -- wanting to maintain an "objective", non-judgmental position, amongst all informants and respondents -- did not want to be publicly associated with negative comments by any informant.

Respondents

Visits to respondents started with an informant taking me to a house on my list of randomly selected lots. He knew the family, made the introductions, and stood around while I chatted with the family. It was all fine until I began the heuristic elicitation exercise which generated feelings about personal poverty. At this point the informant felt uncomfortable. And later, when I walked through the house with the respondent I knew he too felt

uneasy in showing his rather unconsolidated house to a stranger while his more well-to-do neighbor looked on. I knew that the informant felt bad about bringing this uneasiness to his neighbors. I concluded that for this informant's reputation, I would have to work alone in his part of Santo Domingo.

Another informant, though, had no problem in taking us to visit respondents. On his street, he quickly entered the previously randomly selected houses, acted as our intermediary in explaining our mission, and stood outside disinterestedly as we went about our work. For us, it was satisfying to see that we were making progress, that the consolidation and HEM research were working, and that the data were building up. However the informant frequently had other things to do and was rarely available. We quickly learned to work without him.

At all the houses we initiated our meetings by introducing ourselves, explained that we were from the US, were interested in self-help housing and wanted to chat with the owner - builder of the house for a few minutes. We typically had to expand on this explanation. We had to say that we were from a University, that our research was private and that the information was not for the Mexican

government. Moreover, I elected not to discuss the comparative aspect of our study with neither respondents nor informants of Santo Domingo because we felt they were most often very pleased with their housing accomplishments. We did not want them to feel that they were being compared with others. Rather I typically explained that we sought information on self-help construction because Mexico -- obviously -- had much to teach us about this type of construction activity⁹.

Houses were designated for interviews by random selection. We picked 40 houses for 30 interviews in Santo Domingo, but had to go back and pick additional houses because of rejections based, in part on the following problems:

1. Some households were empty. The people had moved to another town.

2. A number of households elected not to talk with us. We felt that Santo Domingo had the highest number of people who, for one reason or another, felt that it was not in their best interests to let us see their houses or to chat with us. Some inductive rationalizations are: we

9. An older man on hearing this explanation said to me, "You mean to say you Americans finally want to listen to what we have to say?"

saw a good number of door-to-door salespeople in Santo Domingo; everything from bible sales to soap and bleach sales to church solicitations. We suspect that Santo Domingo's convenient location in the City makes it highly desirable and people thought we might be looking for housing for ourselves, for a way to get their houses from them, or to con them out of something. (Indeed, on our last trip into Santo Domingo, we were accosted by a middle aged lady who wanted to show us her house because she wanted to sell it). And some people -- we thought them rather paranoid -- felt we might be secret agents of the Mexican government¹⁰.

3. A few houses were inhabited by renters or recent purchasers or by people who had the resources to stand back and have the whole house built by others. This latter group, typically, had been in the house for less than 10 years, and had bought the land from an original settler. We rejected them because of their recent entrance into the settlement area and because they did not meet other criteria.

10. Shortly after writing this it was announced that President Carlos Salinas de Gotari has promoted to congress (and they are backing the idea) that the government do away with the Revolution's promise of granting ejidal lands to indigenous peoples.

4. People were not at home because they were working. We often were greeted by children home from school or by lonely but growling dogs going about their work.

At first we went to Santo Domingo every day for respondent interviews. We thought we would be able to move the research agenda along. While we were able to conduct qualitative research through observation and chatting, we were only able to gather a few interviews per day in this manner. We learned that too many houses were empty during the work week.

The protocol for respondent interviews was, with minor variations, the same for all four colonias: introductions/purpose of the interview, a solicitation for a history of the respondent's experience in building the house, makeup of the household, history of the colonia, HEM exercise, housing consolidation evaluation, payment. On occasion we would be invited to have a cool drink¹¹.

The approximate rate of rejection approached 50%.

11. In some instances we paid dearly for this pleasure as dysentery soon followed. Knowing about this possibility in advance did not deter, however, our objective of cultural integration. We took our aguas de mango knowingly, but with smiles.

Research Methods at Palo AltoBackground

I visited Palo Alto in 1986, met the president of the settlement, and had the opportunity to ask him questions about the settlement's history and to test the HEM protocol. As president, he was a strong backer of the cooperative. He was very familiar with its history -- having lived it -- and had a scrapbook of photographs taken during the early days.

In 1991 I stopped in to renew my acquaintance with the president but it was clear that significant changes had occurred. My first hint was that the formerly spartan, monk-like interior of his house had become baroque with a profusion of desks and chairs, a large dining table, and a huge wooden crucifix on the wall. He told me that he was no longer the president, and furthermore no longer supported the community. He was so disenchanted with Palo Alto that he sought, with some others, a way to sell out at a profit so that he could move elsewhere. He suggested that I ask around to learn what was happening. He knew of my inquisitiveness about Palo Alto, but rather than discuss the settlement as he had in the past, he now choose to be politely cryptic.

His entrepreneurial work for wealthy Mexicans and Americans, it seemed to me, had not only made him prosperous but recolored his ideology. He said that the current leaders, unlike himself, no longer could understand that there were "good", respectable, Americans. The new leaders were strongly anti-US because, in part, of its war against Iraq¹². He felt that I might have significant problems with this leadership and my efforts to gain admittance into the settlement might be unsuccessful.

As a result of this meeting I identified two major problems facing the research agenda in Palo Alto: 1) that a segment of the community was, for some reason, disenchanted with the community-based concept and wanted the settlement's restrictions on selling houses for profit relaxed. It was puzzling that after suffering its violent history, and the laborious construction of their settlement, that people wanted to disband. And 2) that the current leadership identified their problems (and those of others in the Third World) with dominating and exploitative First World nations.

12. We arrived in Mexico one day before the US and other UN-sanctioned forces began to bomb Iraq.

Informants

I contacted the new president as soon as I could. Ulla and I sat with him and his wife in their living room and chatted about our research program. I explained my interests in Palo Alto and that we desired to compare it to the ubiquitous, individualistic, settlement. I described the research as being hard-nosed -- that is to say I was interested in comparing community-based and individualistic settlements with empirical data -- and that I would be less effusive, normative and ideologic than might have been their experience with other visitors. They agreed to support this approach. The same evening I explained my own generally leftist position so they could more fully understand why my research actions needed an empirical base. This conversation was an attempt to forthrightly explain the research, the associated methods, and my perspective. Additionally, I hoped to also counter any anti-American sentiments by accurately describing my own political perspective and by relating this description to the research.

Following the president's suggestion, I put together a written explanation of the research agenda. I was assured that the settlement's governing committee would review my

request to interview people and work within the settlement. He would let me know if the research project would be acceptable.

A few weeks went by without word, so we revisited the president. That evening we received word that we could go ahead. However, we were required to bring our list of randomly selected house units to him for prior approval so that we would not accidentally interview those disaffected settlement members who sought its dissolution.

It occurred to us that there was, nevertheless, some foot dragging on our agenda by the settlement's officials, so -- more or less in desperation -- we began respondent interviews. On one of the first interviews, when explaining our research agenda and the president's approval of our work, we noticed that a woman sent her husband to check on our word. Later, when I reviewed houses with the president he said that he knew I was working in the settlement because people were reporting to him about us. Thus the research got underway.

The informants - people who gave us an inordinate amount of time - explained the history of the settlement's struggle; how it fought against not only the former owner but also against bayonet-slashing military units from the

government. With the exception of two university educated children of Palo Alto families, all of the informants were original members of the settlement. One was a small boy when the people claimed their land, and two older adults were women who, to make their homes, worked day and night as block layers, ditch diggers, food preparers and child nurturers while also attending to sometimes alcoholic, but laboring, husbands.

One of the "children", now a teacher and a member of a settlement committee, probably came closest to the former president's description of an anti-American¹³. We inadvertently gained his cooperation because we were recommended to him by his mother, an elder of the community. We worked hard to lay out our own political agenda, to assuage any conflicts he might have. We later faced a miniature inquisition before him and a small contingent of younger settlement people over our work, the US, and the possible negative attitudes they thought we might harbor about the settlement. While Ulla sided with me on the heartfelt nature of the research, she sided with their feeling about the inappropriateness of my cash payments to

13. His attitude toward Americans was, in reality, no different than that of any contemporary Mexican intellectual who, a priori, disdains affiliation with things norteños. This was not a new reality for me.

respondents and informants. I, for my part, argued that it wasn't unrealistic to support the community in this small way. Underlying the confrontation was the fear that outsiders were, in fact, coming into the settlement to pry apart the community membership¹⁴. Perhaps the divisive nature of cash to a random sample did not aid in community solidarity. By the time we discussed these matters, though, we were, in fact, finished with respondent related research.

Respondents

We had variable success in gaining admission to households. Usually, though, Palo Alto people were more open than Santo Domingo residents. The respondents can be grouped into two categories. The first group contained people who had actively worked, in spirit and body, for their settlement; and the second group were more passive people who were at the site and became part of the settlement through proximity. The first group was very helpful in describing and explaining the settlement's history,

14. Builders interested in converting Palo Alto into a site for elite housing have pried some members from the community with promises of high prices for their lot and house. This fracturing of the settlement is limited, and the organization expresses confidence that the threat will not amount to a dismantlement of the cooperative laws of the settlement.

details of building, the relationship between men and women during construction, confrontations with the state, and so forth. The second group was less effusive and more closely followed our research protocols. A few anti-settlement respondents were removed from our list at the behest of settlement leaders.

Research Methods at UDEVHOR

Background

When we first arrived at UDEVHOR, up in the Tlayacampa hills of Tlalnepantla, we stopped at the first door and asked if it was "La Romana," explaining that we had been searching for it for a week and that we were architects. The response was astounding. We were instantly shaking about ten pairs of hands, there were introductions to people in adjacent housing units, and we were quickly escorted to the settlement's office. There we were given an effusive lecture on the history of the community.

Respondents and Informants

We explained, in due course, that we wanted to shortly return to begin research on housing among members of the settlement. Our intentions, we said, were to speak with long-term community members. We wanted to interview people in 30 randomly selected houses. This was willingly agreed to by a group of mostly men who were introduced as various officers and long-term residents of the community.

When we eventually returned with our list of randomly selected housing units (we had picked 30 from the total

settlement population of 50 units), we went to our first house, and the woman insisted on taking us to a number of her friends' houses. I did not reject her offer, thinking I would later return to my list.

On the next research day, the settlement gave us a list of houses - totally 30 - with names and unit numbers. We were told that we would visit these households and that on all visits we would be accompanied by two of the oldest and most influential members of the community. In our absence, the community had decided we would have guides and that they would select the houses we would visit.

I explained the need for a random sampling from the community; however, my explanation was effectively rebutted by the community. They revealed that of the 50 units in the settlement only 30 were occupied by people who were original occupant / builders of the settlement. The other 20 units were occupied by people who were not involved in building and, furthermore, not in support of community-based settlements. Of the 30 units, it turned out that the unoccupied office had been counted, one unit was empty because the occupants were in the US, and one unit was not occupied by a permanent resident. Thus we had an entire settlement population of 27. Since the research sought to

compare community-based with individualistic settlements, it seemed realistic to investigate only those who met our central criterion: they must be the original occupant-builders of the shelter in which they reside. I accepted their list as being fully inclusive of the appropriate population for the research.

As it turned out, having respected guides turned into a real asset. We spent no time "selling" our research agenda or cajoling people into letting strangers into their houses. As it happened, one of our guides would knock on the door, and while exchanging hellos would explain that we were foreign visitors who had some questions to ask about UDEVHOR. Not only were we always warmly welcomed, but because of the presence of our guides there was a good deal of established trust within which we were able to ask questions, explore experiences, and talk.

We had many lengthy and good conversations, and as the interviews progressed, we began to continually look closely at our guides and draw them out on historical issues and on variations in different households. In this way the guides functioned as excellent, on-going, informants. Most of their conversations were in the presence of respondents, so collaborating (or contradictory) statements were always added by our respondents. It surely enlivened

conversations. Personal questions I might have about individual households were saved until I could speak privately with the informants. Respondents, knowing our schedule better than we, eventually prepared for our visits. Sometimes, we were met with meals prepared hours in advance or with cool soft drinks.

In general, UDEVHOR respondents and informants were more relaxed and open than in any other settlement. By the tenth house or so, one guide was so conversant with our methodology that he took great pleasure in beating me to the explanation of the photographic heuristic elicitation exercise, along with numerous possible responses which he had by then heard from other respondents. So as not to offend his well meaning participation, I always had to add that his examples were good but purely hypothetical. I would only be interested, I said, in their personal, heart-felt responses. Rarely, after this admonishment did anyone use the guide's examples as fact.

There were a few times when respondents resented the informants' cigarettes, but otherwise our guides were very helpful, sinking into living room sofas while introducing us, accepting cool drinks, letting people tell us how instrumental they had been in the building and stability

of the community. They were indeed greatly respected members of the community, and we felt (and continue to feel) awed by their works and their unassuming manners. In addition to the guides as informants, we conversed at length with several settlement office holders, and a university-trained daughter of an original member of the settlement. They all discussed the community's history, legal framework, problems, work brigades, and so forth. While listening and talking, I made notes of salient points of the conversations.

Methods at Reforma Urbana

Background

Our entrance into Colonia Reforma Urbana in 1991 was our first. And, unlike UDEVHOR, there was no welcoming committee. Having scouted the area, we knew from people in UDEVHOR that the upper parts included people from the Hospital La Romana in Tlalnepantla. I selected a zone for sampling, and we began to slowly walk up and down the area to familiarize ourselves and the residents with each other. Often we would stop at a small bodega, buy a cool drink and have a light conversation with the store owner. As a qualitative research device, this worked well in Santo Domingo, but I found it minimally useful in Reforma Urbana because the store owner was usually drunk. Nevertheless, I explained to him that I found the houses in the area interesting, that I was an architect, that such examples of successful self-help housing were fantastic as works of individuals. I was spreading the word of our arrival and interest, but not the intent of the research.

We made a number of such reconnaissance trips. Each time we slowly walked around and repeated our drink stops. Additionally, it was now Easter time and the children were out of school and very curious about us. So, too, was a

construction worker who, while building an addition to a house, chatted with me about building. By the fourth trip or so we were explaining that we liked the houses, wanted to talk to people in them, and had questions to ask. When we suggested to the kids that we might want to talk to their parents; they backed off immediately: that wasn't fun. Yet, they remained our good companions. When I mentioned to the construction worker that I'd like to discuss housing with some owners, he said that up the street was a master builder (away for the Holy Week vacation) who would know much about local houses.

By the time we put together a list of random houses we had a good following on the street. We were always quick (in an area where gangs of young unemployed men would stand in your way and try to stare you down) to say hello and briefly chat. By the fifth visit people were responsive. When we knocked on our first door (with a flock of kids at our heels) we were on our first steps toward integrating into the neighborhood.

We spent many hours in Reforma Urbana and often had dinner, refreshing drinks (aguas and refrescos), and sometimes were presented with gifts. We, for our part,

made a point of reciprocity. We brought food to those we had met who, in our opinion, could benefit from additional nutrition and the saving of some food money.

Informants

Our informants were, as in Santo Domingo, individuals living independently in the city. That is to say, they were not systematically connected to each other. We found, though, that the comadre / compadre system was very alive in Reforma Urbana. These strong ties, however, extended to no more than a family or two. Thus we were dealing with individuals who had their own ideas, who worked out their own relationships with the city, and who built their houses accordingly.

Several of our informants admitted, under repeated probes, that they had come from the Hospital La Romana site in Tlalnepantla. Coming from this more destitute and politically charged squatter settlement did not, apparently, fit into most people's preferred life history so they did not care to discuss it. And no one admitted having come from UDEVHOR, or of knowing about it. It might have been a sore point, so I quickly let it die. Most people enjoyed telling where their roots were: Chihuahua, or Puebla or some other area far from Tlalnepantla. We

discovered a wide range in the areas of origination. There was no sense that the settlement at Reforma Urbana tended toward any geographical homogeneity as suggested by Poniatowska (1991b) -- except, perhaps, the unstated common background of La Romana or a squatter experience in the hills of Tlayacampa.

Our informants had varied occupations. Several were small scale business people who had secured sufficient funds to own one or several colectivo vans. We found that these people had some of the more consolidated and visually diverse and interesting housing in Reforma Urbana. They usually, though, preferred to gloss over their initial settlement into the community. They briefly discussed the bargain price of the lot, the hand labor of shelter building, and the work on road paving and sewers with the state. They were more engaged to elaborately discuss (and show) their more finished accomplishments in housing. They were proud of embellishments and high levels of consolidation. For example, one house was the only one in Reforma Urbana with fully piped water and an internal water cistern for 24 hour water service. And another had a series of bedrooms opening onto a balcony with a view of the Tlalnepantla valley, as well as a built-in shrine to the Virgin of Guadalupe.

One informant was a builder. He was one of a number of locals with the skills to undertake housing construction. Like the other informants, though, while he was able to comment on the settlement genesis, his focus was on his accomplishments in house building. His house was a large imposing structure when viewed from the street. He described the construction of his house, the construction of others, the development of the street, the interaction of the people with the state. I gained a sense from him that there was little community action except that organized by the state to force the neighbors to fulfill their obligation of providing the labor component for infrastructure development.

Other informants were people who lived and worked locally. One scavenged the neighborhoods for throw-away junk and the other had coin-operated video games in his house. These lower-income informants were more willing to discuss the difficulty of putting a roof over their family and the work on the sewers and the roads for the state.

Respondents

Respondents were selected by random sampling. Yet, when one respondent suggested that we visit a relative, a neighbor, or a comadre we did so without hesitation. This

balanced out with those would-be respondents who rejected our request for interviews. I kept an eye, though, on a representative balance between poor and better off households in the study area.

Our research methods in Reforma Urbana did not differ from those utilized in Santo Domingo except that we refrained from taking photographs because, based on our experience in Santo Domingo, we feared that respondents would become fearful over such documentation. Although this was our major reason for not taking pictures, the risk of daily moving in the area with a camera was great. Therefore, much to my disappointment, I went without documenting the interiors of the visited houses. Since the intent of the camera was to offer the reader a visual means of comparing my observed levels of housing consolidation with theirs, I feel I achieved this goal, nevertheless, by offering comparable photographs taken in the settlements in Mexico City.

Having now described the unique characteristics and constraints of each case study, it can be seen that minor variations in research methods have occurred. The samples in Palo Alto and UDEVHOR were constrained by the settle-

ments but in a manner which only allowed for a more concise definition of a community-based settlement's occupant / builder. Otherwise, given the variations of settlement and cities, it can be seen that the research methods for each case study closely followed each other.

Now, having presented the research methods, and having reviewed case study settlement variations, the analyses of the research investigations follow. First the heuristic elicitation methodology based research will be analyzed, the built environments will be investigated, and finally the housing consolidation level research will be evaluated.

CHAPTER 6.

ANALYSIS OF HEURISTIC ELICITATION RESEARCH

Introduction

Heuristic elicitation (HEM) exercises uncovered differing occupant - builder housing design preferences at the four case study sites¹. In individualistic settlements, respondents were randomly drawn from the study area. In Palo Alto community leaders reviewed the list of randomly selected houses and rejected several because they were part of a group attempting to disband the settlement's cooperative legal framework. In UDEVHOR, the entire population of 28 households of original occupant-builders was interviewed²

After starting research in Santo Domingo we worked simultaneously in both Mexico City settlements. Upon concluding the Mexico City studies, we then shifted to

1. See the chapter on research methods for a detailed description of this qualitative research methodology.

2. One family more than the 27 at-home occupant-builders took part in the HEM research. This was a person who had lived for many years in the settlement, was temporarily living in one of the shacks built for early site occupancy, and awaiting an available housing unit.

Tlalnepantla where we studied first UDEVHOR, and concluded the investigation with Reforma Urbana.

At Palo Alto (Mexico City), 30 people took part in HEM exercises producing 192 varied responses (see Table HEM-1)³. In Santo Domingo (Mexico City), 29 respondents took part, however one was too accommodating, producing only inconclusive results (everything was beautiful). In effect, then, there were 28 respondents from Santo Domingo who elicited 208 responses (see Table HEM-2). At UDEVHOR (Tlalnepantla), 28 respondents expressed 144 design preferences (see Table HEM-3). And in Reforma Urbana (also in Tlalnepantla), 31 respondents provided 149 preferences (see Table HEM-4). The sum of elicited housing design preferences totals 693.

Housing Design Preference Categories

The 693 responses were individually content analyzed into 36 preliminary categories. Fitting elicited housing design preferences to a number of preliminary categories was an experimental process wherein I assessed different groupings of the 693 elicitations until I felt that they began to group into 36 common categories. The coordina-

3. See tables at the end of this chapter for all data mentioned in this chapter.

tion of each response to a preliminary category is found in settlement-specific categorizations. See the Table HEM-5 at the end of this chapter.

To illustrate the process of content analysis, sample examples of categorizing elicitations follows. An elicitation from a respondent noted that a particular house needed "improvement in (some functional aspect of) the house design" (House 1, Palo Alto). I content analyzed this as being in a "Practical" category. Similarly, in Santo Domingo, a response of "doesn't like slim columns because they imply poor construction" was analyzed as to content as fitting a "Construction Quality" category. At the end of each elicitation session I repeated back to the respondents my characterization of their elicitations. They agreed or modified my understanding. I further reviewed selected elicitations with informants as to correct assessment. Both reviews were intended to enhance the construct validity of the study. The 36 categories were, for convenience, coded. The categories and codes follow.

#	Preliminary Categories	Code
1.	Aesthetics	AES
2.	Boring	BORING
3.	Class ⁴	CLASS
4.	Community Pride	COM PRD
5.	Construction Quality	CON QUAL
6.	Craft	CRAFT
7.	Design	DESIGN
8.	Design Consideration	DES CON
9.	Design Improvement	DES IMP
10.	Design Preference	DES PREF
11.	Ecology	ECO
12.	Economic Issues	ECON
13.	Ecologic Amenity	ECO AMEN
14.	Environmental Aesthetic	ENV AES
15.	Environmental Ambience	ENV AMB
16.	Environmental Issues	ENV
17.	Environmental Quality	ENV QUAL
18.	Expensive Materials	EXP MATL
19.	Historic Aesthetics	HIS AES
20.	History	HIST
21.	Luxury	LUX
22.	Nostalgia	NOST
23.	Outdoor Tranquility	OUT TRAN
24.	Perception	PERCEP
25.	Personal Issues	PERS
26.	Practical Issues	PRAC
27.	Privacy	PRIV
28.	Safety Issues	SAFE
29.	Security	SEC
30.	Self Concerns	SELF
31.	Social Issues	SOC
32.	Social Consciousness	SOC CON
33.	Traditional Aesthetics	TRAD AES
34.	Tranquility	TRAN
35.	Vanity	VANITY
36.	Vista	VISTA

4. The term class was not used by respondents in a Marxian sense. It was not used to specifically describe a proletariat or capitalist class. Rather, it was used by most respondents to describe those who have, and those who have not, accumulated wealth.

The enumeration of elicited housing design preferences, Tables HEM-1,2,3 and 4 (at the end of this chapter) contain elicitations with assigned categories.

These 36 preliminary categories were again analyzed for common characteristics. The resulting final categories -- seven in number -- along with the subsumed 36 preliminary categories and enumerations are found in two tables organized by settlement. See Table HEM-6 for Mexico City data, and Table HEM-7 for Tlalnepantla data. The final seven categories not only bring similar elicited responses under one heading but also take, wherever possible, weakly represented categories and attach them to similar groupings. The final categories are:

<u>#</u>	<u>Category</u>	<u>Code</u>
1.	Aesthetics	AES
2.	Personal	PER
3.	Class ⁵ , Social and Economic Issues	CLA
4.	Construction Issues	CON
5.	Practical Design Issues	PRA
6.	Environmental / Ecology Issues	ENV
7.	Security	SEC

5. See earlier comment on the definition of class.

The groupings of the 36 preliminary categories into the final seven categories are as follows:

1. Aesthetics

Aesthetics
Historic Aesthetics
Traditional Aesthetics
Design
Design Preference
History

2. Personal

Self
Luxury Materials
Expensive Materials
Boring
Nostalgia
Perception
Personal
Privacy
Vanity

3. Class / Economics / Social Issues

Class
Economic Issues
Community Pride
Social Issues
Social Consciousness

4. Construction Issues

Construction Quality
Craft

5. Practical Design Issues

Practical Design
Design Considerations
Design Improvements

6. Environmental / Ecology Issues

Ecology
Environmental Issues
Environmental Aesthetics
Environmental Quality
Outdoor Tranquility
Vista
Ecological Amenity

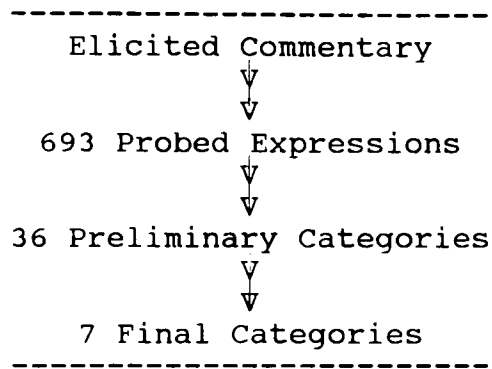
7. Security

Safe
Security

The number of responses by settlement occupant - builders for each of these categories, and the percent of each category for the community-based and the individualistic settlements, are shown for Mexico City and for Tlalnepantla in Tables HEM-6 and 7.

The data path, then, is as follows: 1) From informal HEM exercises with occupant / builder respondents resulting in elicitations; to 2) probing each elicitation (693 in number) to uncover individual expressions of housing design preference. 3) These preferences were then content analyzed to fit into 36 preliminary categories; and lastly, 4) the material was arranged through a final content analysis into seven categories.

The process of organizing the data is illustrated below:



This process follows the clustering and content analysis methodology suggested by Miles and Huberman (1984) in dendogram-like structures to aid in qualitative data analysis. The process of clustering the 693 preferences into the seven final categories organizes the data into nominal groupings which can be analyzed through reviews of qualitatively derived information and through statistical computations.

Analysis of Housing Design Preferences

An analysis of grouped design preferences for each settlement follows.

1. Mexico City

A. Community-based Settlement: Palo Alto

From the 36 preliminary categories, Palo Alto's 30 respondents expressed 192 elicited preferences. A tabulation of the design preferences as content analyzed into the final group of 7 preferences follows:

Palo Alto Housing Design Preferences
Tabulation

Category	Number of Prefer- ences	Percent
Aesthetics	52	27.08%
Personal	11	3.65
Class/Econ/Social	18	9.38
Construction	10	5.21
Practical Design	82	42.71
Environment/Ecology	13	6.77
Security	10	5.21
Total	208	100.00%

B. Individualistic Settlement: Santo Domingo

28 respondents generated 208 elicitations. The content analysis of the 208 resulted in the following composition of the final seven categories:

Santo Domingo Design Preferences Tabulation

Category	Number of Prefer- ences	Percent
-----	-----	-----
Aesthetics	80	38.46%
Personal	7	5.29
Class/Econ/Social	9	4.33
Construction	8	3.85
Practical Design	49	23.56
Environment/Ecology	28	13.46
Security	23	11.06
-----	-----	-----
Total	165	100.00%

C. Comparison of Housing Design Preferences between Palo Alto and Santo Domingo in Mexico City.

The percent response of the case study settlements for Mexico City for the 7 final house design preference categories are arranged in seven grouped histograms in Chart HEM-8 in the Appendix. The x-axis organizes the seven different elicitation categories for a settlement-to-settlement comparison. The y-axis expresses the percent of response, by each settlement, for the various

categories. Below the x-axis, a chart shows the percent response, by settlement, for each of the seven house design preference categories. Chi-square "Goodness of Fit" statistical tests (Hinkle, et al. 1979) were conducted to uncover any statistically significant differences between settlement responses to the design preference categories. This information is also included in the chart below the x-axis.

The calculations for these chi-square (X^2) tests are found in the Tables HEM-9 through HEM-15, inclusive, in the Appendix⁶. These analyses determined that statistically significant differences between Palo Alto and Santo Domingo exist in five of the final 7 design preference categories:

1. Class, Economic and Social Issues (coded CLA): $X^2 = 5.89$;
2. Practical Design Issues (coded PRA): $X^2 = 15.57$;
3. Environmental / Ecology Issues (coded ENV): $X^2 = 6.61$;
4. Security (coded SEC): $X^2 = 6.57$; and
5. Aesthetics (coded AES): $X^2 = 4.78$.

6. At alpha = 0.05 with one degree of freedom, statistical significance occurs when chi-square equals, or is greater than, the critical value of the test statistic, 3.84.

2. Tlalnepantla

A. Community-based settlement: UDEVHOR

UDEVHOR's 28 respondents elicited 144 house design preferences. The final content analysis resulted in the following distribution of preferences in the 7 final categories.

UDEVHOR Design Preferences Tabulation

Category	Number of Prefer- ences	Percent
Aesthetics	34	23.61%
Personal	8	5.56
Class/Econ/Social	13	9.03
Construction	10	6.94
Practical Design	33	22.92
Environment/Ecology	35	24.31
Security	11	7.64
Total	144	100.00%

B. Individualistic Settlement: Reforma Urbana

Thirty-one respondents provided 149 elicitations for 16 preliminary preference categories. These elicitations were content analyzed into the final 7 categories as follows:

Reforma Urbana Design Preferences Tabulation

Category	Number of Prefer- ences	Percent
-----	-----	-----
Aesthetics	32	21.48%
Personal	13	8.72
Class/Econ/Social	7	4.70
Construction	15	10.07
Practical Design	29	19.46
Environment/Ecology	42	28.19
Security	11	7.38
-----	-----	-----
Total	149	100.00%

C. Comparison of Elicitations between UDEVHOR and Reforma Urbana in Tlalnepantla.

As in the Mexico City settlements, the two Tlalnepantla settlements are arranged in seven grouped histograms (see Chart HEM-16 at the end of this chapter). Chi-square "Goodness of Fit" statistical tests (Hinkle, et al. 1979) were conducted to uncover any statistically significant

differences between settlement responses to the design preference categories (see Tables HEM-17 through HEM-23, inclusive in the Appendix). The chi-square value are also included in the chart below the x-axis. These analyses uncover statistically significant differences in only one housing design preference category:

1. Class, Economic and Social Issues (coded CLA): $\chi^2 = 3.99$.

Review of Qualitative Research and Chi-Square Calculations

While in Mexico, we devoted days and weeks of investigatory time to qualitative research within each settlement. This activity included informal observations, chatting with local people in the streets, extended informal conversations with respondents (as well as much longer conversations and reviews with informants in their houses), and -- in general -- "hanging out" in the settlements.

The research intent at this juncture of the study is to uncover relationships between statistically significant differences in housing design preferences that can be attributed to either the differences in settlement type, or to some other intervening variable. Utilizing material from the qualitative research component of the study makes

possible an examination of those variables other than settlement type which can produce the statistically significant differences shown in the chi-square calculations. These differences which may be attributed to variables other than the settlement type (community-based or individualistic) will now be explored.

No effort is made to combine cities in these analyses because of substantial differences between Tlalnepantla and Mexico City.

1. Class, Economic, Social Issues (code CLA).

This category is the only one which is statistically significant in both Mexico City and Tlalnepantla. The response by quantity and percent from the four case study settlements is shown below:

Settlement	Number	Percent	Chi-Square (X^2)

<u>Mexico City:</u>			
Palo Alto	18	9.38	> 5.89
Santo Domingo	9	4.33	
<u>Tlalnepantla:</u>			
UDEVHOR	13	9.03	> 3.99
Reforma Urbana	7	4.70	

A. Comparing Differences Between Cities.

A visual scanning of the percentages reveals that individualistic settlements have similar responses. At 4.33% and 4.70% there is little difference between the expressed preferences in Santo Domingo and Reforma Urbana. These settlements represent a lower level of design preference for CLA issues than either of the two community-based settlements where 9.38 and 9.03 (two values with little difference between them) percents represent respondent preferences. Cross-city statistical analyses are avoided because, in part, the data suggests that site specific variables may be intervening.

B. Qualitative Data Background on Differences between Individualistic and Community-Based Settlements.

Land, Tenure, the State

Community-based settlements came into existence by struggling against the state and private land owners. Palo Alto, for instance, claimed their work site as "their land" through invasion. They subsequently undertook the arduous task of besting a private owner through physical contest on the ground, legal battles in the court, and in government circles. UDEVHOR, too, comes from a militant

background formed at the squatter settlement Hospital La Romana in Tlalnepantla. They were able, though, to move from the contentiousness of struggle to a less strident position by purchasing land.

Santo Domingo, as reported by Peter Ward (1978), was the site for a large land invasion. A portion of Santo Domingo selected for study, though, contains a substantial number of people who, today, maintain that their right to the land was always communal. Yet there are numbers of illegal land invaders, paracaidistas, among them as well occupant - builders who came later by purchasing land either from comuneros or paracaidistas. Today, only a few people admit to land tenure problems. Contentions with the state over land tenure, therefore, are minimal.

Reforma Urbana was conceived as a municipality's solution to unorganized squatting on the Tlayacampa mountainsides and -- as reported by UDEVHOR members -- as a development of cheaply priced lots meant to undermine the communal and organizational efforts of UDEVHOR. Like the portion of Santo Domingo studied, Reforma Urbana residents do not have a contentious relationship with the state.

Community Organization

Today both Palo Alto and UDEVHOR have strong organizations. Yet there are signs of discontent. At Palo Alto some individuals, having achieved economic success, turn their backs on their past. And at UDEVHOR, those late-coming residents brought in to fill gaps left by the Reforma Urbana exodus, do not care to labor for the common good nor share the community's sense of solidarity. UDEVHOR's core group, however, remains strongly organized and committed.

Palo Alto appears to also be organizationally strong. Leaders are confident, new multi-story buildings for the settlement's growing number of young adults have risen. All feel deeply that their "invasion", organization, and construction activities have resulted in housing which, as individuals, they would never have achieved.

Santo Domingo, as the site of a large land invasion on government land, was sufficiently organized to contest the state. Yet, when the threat of expulsion from the land was removed by government assurances for future land tenure, the organizational framework dissolved. No clear

grassroots organization exists today. And in Tlalnepantla, the residents of Reforma Urbana never had a reason to organize. Their house lots were affordable and made secure by land titles from the state.

Method of Building

The community building efforts at Palo Alto and UDEVHOR had a binding effects on the settlement populations. The strenuous and demanding work, after many years, has matured into a bond between many residents. And while they are older and have mellowed, they walk about daily in the positive product of their contentious youth. They believe they have a better place to live than any other settlement of people with their economic limitations. They are proud of their communal efforts and acknowledge that without the community organization, their plight would be to live in less finished housing. "I know people," said a Palo Alto informant, "who live in a ravine over on the other side of the highway. They began to build when we did but they still have a house of cardboard, plastic sheets, and no electricity. Our way of building was better."

And UDEVHOR settlers indicated that their pride is not in the unit design nor the siting on the land, but in the actual buildings which they put up themselves. One woman

we talked to put her arms around a corner in her house, hugged it, and said "I love this place: we built every part of it ourselves."

In contrast to UDEVHOR and Palo Alto, Santo Domingo and Reforma Urbana residents undertook house construction on a family or individual basis. Their houses are unique to their ideas, needs, and incomes. Builders might have aided in planning, but all are the creations of their owners - builders. Often builders were contracted for construction.

These different ways of accessing land, organizing, and building, relate to how people respond to design preferences. Community-based respondents would be expected -- based on their land, organizational and building experience -- to elicit design preferences which focus on such issues as: ideology about accessible housing for all, the problems of over-provision of housing for and by the rich, and/or the personal holding of a social consciousness about housing. These sensibilities reflect their common experiences. In contrast, individualistic settlers are more likely to express preferences for attributes of buildings which reflect their individual economic status and/or aspirations.

C. Analysis of Settlement-based Distinctions in Commentaries

The HEM responses for the three preliminary categories Class, Social and Economics were combined into one category to create the final "Class, Social, and Economic Issues" group (coded CLA). These were grouped because a separation into more discrete categories would result in numerical values less than acceptable for statistical analyses. In order to more clearly understand the distinctions between the settlement types in the CLA responses, it is necessary to closely inspect the actual elicited responses collected in the settlements.

A further review of responses within each of the preliminary categories shows that there exists three rationalizations for selecting a class, social, or economic category. These three rationalizations are ideological, economic, and personal. This is to say that the reason why some respondents elect to respond with a class (for example) comment would, upon content analysis, be shown to be either ideological, economic or personal. For example, if a class comment is based on a "concern for housing all the people" then, knowing other circumstances I might conclude that this response has an ideological

basis. And, similarly, if a respondent stated that the photograph showed an upper class house which was unaffordable to him, then the basis for the class classification might, all other circumstances being taken into account, be an economic basis for the class related statement. By analyzing the CLA category in this manner it is possible to see more clearly the distinctions between the settlement types and to develop more specificity within this category.

The three categories of ideology, economics and personal were discovered by reviewing the elicited differences. A review of the CLA responses on a settlement-by-settlement basis, with a judged rationalization, in brackets, now follows.

Santo Domingo

(Note: House numbers have been mixed. They do not refer to actual house numbers.)

An inspection of the CLA responses in Santo Domingo shows, of the 9 total, 4 related to class and 5 related to economics. Following comments on each of the elicitations will be a recategorization (in brackets) of the comments into either ideology, economics or personal groups.

Respondent comments from the final Class/Econ/Social (CLA) category: preliminary category Class:

1. Unaffordable

Based on observations of respondent's residence, unemployment status and the family's need to sell candy on the street, my sense is that they are in the lower level of Santo Domingo's economic strata. There is a need for an increase in income, but moreover - there is a sense of unattainability based on their acceptance of their "place in life." [economic]

2. Too dominating a place

Respondent appeared pleased with her house and way of life. She was happy in her small garden surrounded by grandchildren. She did not seem to be in economic need, but felt a photograph of a large house portrayed a dominating environment based on the advantages held by a powerful upper class. [personal]

3 and 4. Higher-class house. We don't have the money for such a place.

Respondent was paranoid during the interview. He had fears that we were government inspectors, that he might lose his house because of what he said or what we thought about him. His family sold candy on the street. Probably in the upper part of Santo Domingo's lower economic stratum. Insecurity plays a major role here. They see themselves as inhabiting a lower-class stratum. [economic]

There are 5 respondent elicitations in the preliminary category Economics:

1. Likes a space for a car.

Respondent is in the upper economic group of Santo Domingo. The family has its own business which requires technical expertise and education. (Well off family looking to buy more comfort.) [economic]

2. Colonial style liked because of its cost effective construction.

Respondent concerned about money. Based on their house and conversations with members of the family, there is very little income for amenities such as carpeting or television or a well finished house. (Respondent evinces an economic need). [economic]

3. Perceived space available for income producing activities.

Respondent is from a family which is economically successful, and they energetically seek more wealth. (Well off and responsive to opportunities to acquire additional wealth.) [economic]

4. Roof is too expensive

Respondent is from a family which has experienced economic advancement and has a stable economic base. They are sensitive to build their housing with affordable building materials. (They evince a careful attitude toward expenses. They seem to manage their money cautiously in order to maintain or improve their well being.) [economic]

5. Struggles are needed to have affordable housing.

This couple was reluctant to talk with us until we described our work in the context of helping others learn more about self-help housing. They found the HEM exercise superfluous and righteously intervened to speak about the self-sacrifice and hard work which make up the struggle they feel one must undertake for housing. (Only hard work, individual sacrifice, and struggle will provide housing for the poor.) [ideology]

PALO ALTO

The Class/Economic/Social comments from Palo Alto, 18 in number come from the 36 preliminary categories as follows:

Class	7
Community Pride	1
Social Consciousness	10

Total	18

Palo Alto comments:

(Note: House numbers have been mixed. They do not refer to actual house numbers.)

Social Consciousness preliminary category (10 elicitations):

House 1: 5 comments on social consciousness.

These respondents were active in the organization of Palo Alto since they were small children. "I used to run naked through the mud paths because there was no money in my family to clothe me." They were educated by Father Escamilla ("You should understand why you are poor and how all of you can help each other..."), brought into the church by him, are today strong members of the community church, and are active in the on-going organization of the settlement. (Respondents strongly felt that housing sized larger than the needs of one family should be shared with other families.) [ideology]

House 7: 2 social consciousness.

The respondent had little education, and apparently had not been able to devote much money to the finishing of his house. Furthermore, he seemed to have an alcohol problem.

Despite all this, he felt, when looking at one of the HEM photographs, that in lieu of a large house (the "grand castle") shown that perhaps 15 or so "little castles" could have been created. "Why not have a plan that is logical for all the people?", he said. Another response, when viewing the photo of a small house, was "This house would be good as a repeatable model for many people to have." (Based on the community-based settlement experience, this respondent understood housing at the community level. The comment reflected a logic of sharing to satisfy the basic needs of all.) [ideology]

Houses 22, 28, 29: A total of 3 responses. All were concerned that housing should be sized to minimum dimensions so that the constructed facility will house a maximum number of people. [ideology]

Community Pride preliminary category (1 comment):

House 10: 1 community pride.

These people represent 3 generations (grandmother, married couple, daughter/grand-daughter) who enjoy the advantages of Palo Alto. They have a neat and tidy house. (Their sense of community pride is based on their access to

affordable housing and the cohesive community which made it happen. They are very happy with what they and their community has attained in housing.) [ideology]

Class preliminary category (7 responses):

House 17: economically unattainable house for them. 4 class comments.

The woman with whom we conversed was struggling with a child whose desire for breast feeding coincided with our visit. After some shrieking, a modesty blanket in place and tranquility, we learned that for her many of the houses in the pictures used for the HEM exercises represented "opportunities which the poor cannot have." that there were "houses too big for us to afford", or a "house for a millionaire" (She liked the photo of apartments because she thought their smallness would make them affordable to people in her economic circumstances.) [economic]

House 19: 3 class-related comments.

A vivacious family with everyone participating in the photo elicitation exercises, there was agreement that a large house was economically beyond their means and inter-

est (imagine having to clean it!). But from another perspective it was said "that we have a tradition of sharing our house with the family, with our children...but the house is too large for one family." Additionally they commented that the luxury of a unique house design was wasteful of labor and material. [ideology]

Analysis of qualitative material in conjunction with HEM exercises.

1. There was nearly an equal number of respondents in each settlement (28:30). The number of elicited responses for the CLA category, though, were twice as great in Palo Alto as in Santo Domingo (18:9).
2. A comparative content analysis of these responses shows finer distinctions within the class, economic and social categories which, upon closer inspection, cross lines between three categories which I identify as ideology, economic and personal. These are not separate categories but are aspects of the identified preliminary categories. For example, within "class" an economic undercurrent may be strong, and as such is identified. The thrust of this exercise is to draw out distinctions between the two settlement types in their responses in this category.

Palo Alto (Note: House numbers have been mixed. They do not refer to actual house numbers.)

Group	Response category (no. of responses)
House 1	ideology (5)
House 7	ideology (2)
House 10	ideology (1)
House 17	econ (4)
House 19	ideology (3)
House 22	ideology (1)
House 28	ideology (1)
House 29	ideology (1)

	ideology (14) econ (4)

Santo Domingo

(Note: House numbers have been mixed. They do not refer to actual house numbers.)

Group	Response category (no. of responses)		
<u>Preliminary Category</u>			
<u>Class</u>			
1	econ	(1)	
2			personal (1)
3/4	econ	(2)	
Econ			
1	econ	(1)	
2	econ	(1)	
3	econ	(1)	
4	econ	(1)	
5	ideology	(1)	
	ideology	(1)	econ (7) personal (1)

These closer reviews of the elicitations show that, on the whole, Palo Alto respondents expressed more of a concern for an ideology for their way of housing than Santo Domingo. Santo Domingo residents tended to more prominently observe class as an economic distance between themselves and more expensive housing. This closer, more detailed, investigation of the CLA category shows a divergence of design preference between the two settlements. A similar investigation of CLA responses for Tlalnepantla follows.

Tlalnepantla

The chi-square for the CLA category for Tlalnepantla is 3.99. The preliminary components of the final Class/Economic/Social Issue category, when broken down between UDEVHOR and Reforma Urbana, are as follows:

	UDEVHOR	Reforma Urbana

Class	3	4
Economic	10	2
Social Consc.	-	1

Total	13	7

The 2+:1 ratio of responses found in Mexico City, is similar in Tlalnepantla where the ratio is 2-:1.

In an abbreviated manner, a concise comment on each case study and responses follows.

UDEVHOR

(Note: House numbers have been mixed. They do not refer to actual house numbers.)

House 8. Economic: Too expensive. [economic]

House 11. Economic: Beyond family income; doesn't have the money. It is a class distinction. [ideology]

House 13. Class: Held back by system. [ideology]

House 20. Economic: Lots of things beyond our capacity
Unaffordable. [economic]
Class: Home of "The Owners". [ideology]

House 21. Economic: Only for the rich. [ideology]

House 24: Economic: Too expensive. [economic]
Economic: Too expensive. [economic]

House 25. Economic: A simple facade would serve as well.
[economic]

Class: Pretty, but not of his class. [ideology]

Class: Pretty, but beyond her means. [economic]

Class: Pretty, but wasteful for the rest of the
people. [ideology]

Reforma Urbana (Note: House numbers have been mixed.
They do not refer to actual house numbers.)

House 2. Economic: Financial security. He likes his
house because he is financially independent in self-built
housing. In an apartment, the "rent is always due."
[economic]

House 6. Class: The house shown is "As it should be" for
the middle class such as himself. However he was not of
the middle class. Rather I understood the remarks to
indicate his aspirations. [ideology]

House 9. Class: "This is not the place for me," he said.
But his adult daughter liked it while recognizing that it
was beyond her economic, social and class spheres. [ideol-
ogy]

House 23. Social: sociable environment. [personal]

House 29. Class: Class distinction. "The house is very rich. It is too beautiful for me." [ideology]

House 30. Economic: Has exchange value. [economic]

House 32. Class: Class distinction. [ideology]

The following charts organize the above material on Tlalnepantla, as did the previous chart on Mexico City, to provide an analysis of the "ideology", "economic" and "personal" bases of the responses.

UDEVHOR (Note: House numbers have been mixed. They do not refer to actual house numbers.)

```

=====
House 8                               econ (1)
House 11  ideology (1)
House 13  ideology (1)
House 20  ideology (1)                econ (2)
House 21  ideology (1)
House 24                               econ (2)
House 25  ideology (2)                econ (2)
-----
                ideology (6)          econ (7)

```


Reforma Urbana

(Note: House numbers have been mixed. They do not refer to actual house numbers.)

```

=====
House 2          econ (1)
House 6  ideology (1)
House 9  ideology (1)
House 23          personal      (1)
House 29  ideology (1)
House 30          econ (1)
House 32  ideology (1)
=====
          ideology (4)  econ (2)  personal (1)

```

Analyses of Differences Between Community-based and Individualistic Settlements.

An analysis of data between Mexico City and Tlalnepantla shown below indicates similar responses: the community-based settlements have ideologically developed perspectives (64+%) where respondents are inclined to share housing, and to define shelter needs in terms of minimum habitation requirements. Individualistic settlement respondents speak principally from the economic perspective (69+%) of individuals. Furthermore, their ideological perspective (38+%) is not the ideology of sharing

housing but rather the ideology of independent achievement of housing. Spreading these responses out linearly provides a view of design preference motivations which move from an ideology of sharing on the left, to economic concerns in the middle and tending to the right, and personal concerns yet more to the right and, farther to the right, an ideology of independent acquisition. The community-based settlement responses tend to locate to the left while the individualistic settlements tend toward a right-side orientation. See the charts below..pa

Community-based settlement totals

	ideology	econ	personal	(total)
Palo Alto	14	4	-	18
UDEVHOR	6	7		13
	20	11	-	31
	64.52%	35.48%		

Individualistic settlement totals

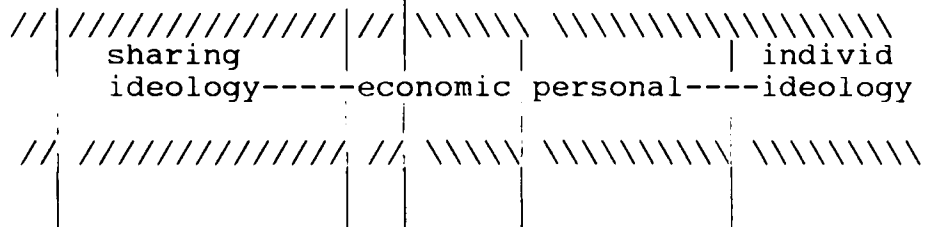
	ideology	econ	personal	(total)
Santo Dom	1	7	1	9
Reforma Urb	4	2	1	7
	5	9	2	16
	31.25%	56.25%	12.50%	

Chart Showing Distribution of Elicited CLA Category Responses with Community-Based and Individualistic Settlements

Settlement type:

Community-based>>>>|<<<<Individualistic

Distinguishing motives for CLA design preferences:



Community-based and individualistic settlements distinguish between the CLA housing design preference in that community-based builder-occupants tend to think of designs which can be shared, while individualistic builder-occupants tend to consider the distance between their specific economic circumstances and the possibility of more comfortable and desirable "grand" housing designs of the well to do.

It is in this latter sense that Peattie's observation of lower-income Venezuelan house builders of quinticas (Peattie 1968) comes into focus. And Salmen's investigations (Salmen 1987) in Bolivia and Ecuador also fits into the foregoing analysis. Lower-income urban settlers

desire those housing attributes normally associated with successful members of the capitalist city. They understand the acquisition of sewer lines and housing improvements as "steps up" in the city. The individual desires to integrate into the city, to make good on economic and other opportunities. Such integration would allow these lower-income urbanites to say with the confidence of innocents, "somos gente" (we are people [now assuming "city" stature]). To that extent, they have integrated into the city.

An analysis of design preferences where only one of the city's settlements develop statistically significant values follows.

Significant Design Preference Categories:Security

The data of the study supports the supposition that security is a statistically significant design preference category in Mexico City ($\chi^2 = 6.57$). In Tlalnepantla, though, there is no realistic difference between settlements in the percentage of security responses ($\chi^2 = 0.01$). An explanation of the differences between the settlements follows.

Palo Alto's location and strong social organization differs from the other three case studies. Palo Alto is on a plain, separated from its neighbors by high cliffs, steep hills and open fields (see the sketch at end of the Case Studies chapter). Immediate residential neighborhoods are elitist upper-income residents. The only road leading into Palo Alto serves just the settlement, a crematory, and upper-income residences. There is usually a line of taxis on this road waiting for customers to call. These taxis effectively guard the entrance to the settlement. To the rear of Palo Alto is an open soccer field with low level hills leading to a very small lower-income settlement. There is no through traffic at Palo Alto: it must all be directed to particular addresses or

residents will watch the car. Additionally, Palo Alto has a very active vigilante committee which is responsible for maintaining night and day security. There are no strangers passing through. Everyone knows each other.

In contrast, the other case study areas are situated within the urban sprawl of lower-income housing settlements. Santo Domingo is a large open area with substantial automobile and bus traffic. It is within reasonable walking distance to a subway station. UDEVHOR and Reforma Urbana are part of the large lower-income housing area of Tlayacampa. Geographically, UDEVHOR is separated from its neighbors by a low stone and concrete wall which is readily breached. The community is not large enough to have a strong vigilante patrol system. And Reforma Urbana is open to its neighbors on all sides except the highest elevation which is an open stony field reserved for a cemetery. Yet, intruders can (and do) easily come from the cemetery as well as from below. (See sketch of UDEVHOR and Reforma Urbana locations in the Appendix.)

We received many comments about drug use, break-ins, and robberies in Santo Domingo, UDEVHOR and Reforma Urbana, but not in Palo Alto. We discovered abandoned hypo-

dermic needles on the ground in UDEVHOR, and we were aware of difficult situations of heavy drug use in the area below. While Reforma Urbana's upper, more isolated, reaches offered some insulation from theft (no buses or auto traffic went through the area), there were always comments about theft and robberies. People in Reforma Urbana, as well as in UDEVHOR, continually expressed concern about our safety.

Because of observations and conversations in the four case study settlements, the basis for the chi-square difference on security issues between Palo Alto and Santo Domingo can be attributed to 1) the unique geographic and social circumstances surrounding Palo Alto, and 2) Palo Alto's active internal policing organization. While it can be argued that UDEVHOR would have had a response similar to Palo Alto if they had an active vigilante organization, the fact remains that their small population cannot support a vigilante group. Nor can they erect sufficient physical barriers to be physically isolated from neighbors.

On the basis of these observations, security is discounted as a housing design preference having significant differences between community-based and individualistic settlement types⁷.

Practical Design Issues

The practical design preference category focused on such building elements as respondent concern for safe stairs for children, well placed windows that let in light, tight roofs that will not leak, and other, similar, practical issues. Visually reviewing the four case studies, Palo Alto stands alone with 42.71% of respondents expressing preference for practical design issues. This differs significantly from the companion individualistic settlement, Santo Domingo, where 23.56% expressed preferences for practical design issues in housing design. The chi-square value is 15.57. UDEVHOR (22.92%) and Reforma Urbana (19.46%) have very similar responses. The difference between them is not statistically significant ($\chi^2 = 0.62$). As a group, Santo Domingo, UDEVHOR and

7. Future studies which investigate greater numbers of settlements might look closely at the security issue. I sense that larger, more organized, community-based settlements will have -- like Palo Alto -- effective means to maintain community borders and have night patrols to maintain their area relatively free of crime.

Reforma .paUrbana fall within a range of 4.1 percentage points. With these percentages falling in the 19.46 - 23.56, area, Palo Alto at 42.71% is the exception and requires explanation.

It would seem that differences in the mode of housing production between community-based and individualistic settlements could explain any statistically significant differences between the settlement types. The supposition here being that community-based settlement occupants truly self-build as a community (and, after occupancy, as a family unit for consolidating obra negra housing and addition building). Only rarely do they pay others to do their construction work. In contrast, individualistic settlements often sub-contract major portions of their work and could, possibly, have developed a lesser sensitivity toward practical design issues. While this explanation might explain community-based / individualistic differences, it does not elucidate the differences in responses to practical design issues between UDEVHOR and Palo Alto.

The site at Palo Alto -- larger than at UDEVHOR -- allowed designers to plan future expansion of the housing units with a small measure of generosity. And residents not only worked en masse on housing and finished their own

basic units themselves, but they also cooperated in concrete block production at the community plant. Later they self-built (in either the strictest sense of that phrase or by trading time among themselves) the architecturally programmed additions to their houses and they also enlarged their houses beyond the size foreseen by the architects⁸.

In contrast, UDEVHOR's small land size required designers to join housing units together with common walls. Expansion potential exists only through a constrained vertical building option for two additional bedrooms. A good number of units have made this vertical expansion. Only one person, though, has undertaken innovative unprogrammed construction and this was an aesthetic modification for personal satisfaction. Thus building skills, I suggest, may not be as keenly developed at UDEVHOR as at Palo Alto.

Palo Alto's lack of severe site constraints, ready and affordable access to on-site building materials, and a tradition of true self-help building have, I propose,

8. Almost without exception, unprogrammed additions have been built into the backyard private patio space of the house units. Consequently the community still maintains an image of outwardly unified facades.

combined such that their heuristic elicitations expressed a strong design preferences for practical design issues. They, of all the settlements, have the greatest experience and affinity for practical design issues⁹. However, because the Tlalnepantla case studies do not support a statistically significant difference, practical design issues differences are not considered in this study.

Environmental / Ecological Issues

In Mexico City a statistically significant difference is present in the percent of the sample which selected environmental / ecological preferences in housing design ($\chi^2 = 6.61$). A comparison of percent of response shows that approximately 25% of both UDEVHOR and Reforma Urbana respondents had ENV preferences. Mexico City respondents were considerably less (6.77% and 13.46%). Many Tlayacampa respondents referred to their spectacular view of the Tlalnepantla valley, and proudly described the beauty of the desert mountainside during the rainy season (the research was in the dry season). And at Santo Domingo, with a 13.46% response, it was found that most all lots

9. As in the security issue, a future study might learn more about distinctions between community-based and individualistic settlement preferences for practical design issues when a sample of larger community populations would be utilized.

were generously sized to allow incorporation of numerous fruit trees, lawn, shrubbery, outdoor bird cages, patios, and other outdoor amenities. Thus a reasonable explanation could be offered for environmental preference based on the ambience of their private property. In both individualistic settlements, residents often commented about their preference for shade trees, or the desirability of a grassed area where children could play.

Palo Alto (at 6.77%) is the community with the smallest preference for environmental issues. To explain this low preference requires an understanding of the community lay out. Individual lots are sized so that grass and trees are almost impossible¹⁰. Yet, of all the settlements, their's was the one with tree lined pedestrian walkways, and benches in front of the community church. Their vista, while spacious and grand (if the pollution would clear enough for one to see it) was not spectacular because it showed their now-traditional enemy: the elitist colonias of upper-income residents.

10. So constrained are private outdoor spaces in Palo Alto that a common sight is plants hanging from the patio walls. There is typically insufficient patio space to devote to plantings in the earth.

Hence, I suggest that the preference for environmental / ecological issues reflects the unique site opportunities and constraints of each case study and is not dependent of settlement type.

I find no evidence to support any statistically significant difference between community-based and individualistic settlements with respect to environmental / ecological design preferences, and hence discount it as significant to the study.

Aesthetic

This grouping was collected from such elicitations as stylistic preferences, historic building forms, beauty, prettiness, handsome facade, harmonious, ugly, and so forth. While some comments related to content issues such as tradition, most were formalistic -- pure aesthetics. The percent response by settlement is as follows:

Palo Alto	27.08%
Santo Domingo	38.46
UDEVHOR	23.61
Reforma Urbana	21.48

Testing the percentages between case studies in the same city, a statistically significant difference was found between the Mexico City case studies ($X^2 = 4.78$). Architectural diversity is common in Santo Domingo. It is more diverse than at Reforma Urbana in Tlalneantla - probably because of its greater age and because of the higher incomes and visual diversities found within the capitol city. However no other correlation based on on-site observation can be offered to explain Santo Domingo resident's higher preference for aesthetic matters. Such an area of investigation could be an interesting expansion of the study for a later time.

These foregoing categories: security, practical design, environmental / ecological, and aesthetic have been explained in terms of circumstances unique to specific case study settlements. The study now reviews those design preferences in which no statistically significant differences occurred.

Non-statistically Significant Design Preference Categories:

The categories of 1) class / social / economic issues, 2) practical design issues, 3) environmental /ecological issues, and 4) aesthetics evinced statistically signifi-

cant differences between settlements. The categories of personal issues, and construction issues, when subjected to chi-square tests, did not develop any statistically significant differences. A brief review of these categories follows.

Personal

Personal issues had a maximum response of 8.72% and a minimum of 3.65%. The category includes such elicited responses as a wish for independent housing, a dislike of apartment living, a dislike for a less than polished wall surface, monotonous facades, etc. These individual elicitations were initially grouped under such headings as self, wish for luxury, like of expensive materials, sense of boredom with certain designs, realization that vanity formed part of one's relationship with a building, and so forth. The percent response for "personal", by settlement, is as follows:

Palo Alto	3.65%
Santo Domingo	5.29
UDEVHOR	5.56
Reforma Urbana	8.72

Analyzing the percentages on a city basis, there was no significant difference. Chi-square calculations were 1.80 at Tlalnepantla and 0.74 in Mexico City (Chi-square significant at 3.84).

Construction

The construction issues category combined preference for "construction quality" and "craft" into one group. It brought together such elicitations as a respect for craftsmanship, quality construction finish, a dislike for incomplete construction, a liking for well finished building, and other similar construction related issues. The percentages are as follows:

Palo Alto	5.21%
Santo Domingo	3.85
UDEVHOR	6.94
Reforma Urbana	10.07

The chi-square calculation for Mexico City was 0.48 and for Tlalnepantla was 1.41 (with 3.84 being the level of statistical significance).

Summary of Heuristic Elicitation (HEM) Exercises

Chi-square (X^2) tests in combination with an overlaying of qualitative data derived from on-site observation has provided a holistic analysis of the heuristic elicitations. This "triangulation" (Denzin 1978) shows that the Class, Economic and Social Issue category is the only category which is statistically significant in both cities.

All other categories contain little or no difference between the two settlement types when statistical data is overlaid with on-site observations. Differences in aesthetics, personal issues, construction, practical design concerns, and security are not statistically significant or differences have, through triangulation, been explained as not related to the different settlement types: community-based and individualistic.

Class, Economic and Social issues significantly relate to the different ways the two settlement types produce self-help lower-income urban housing. The group actions of Palo Alto and UDEVHOR can be placed alongside the individual actions of residents in Santo Domingo and Reforma Urbana. The different settlement forms and ways

of housing are the foundation from which springs the design preference responses in the class, social and economic category.

Having determined that Class / Social / Economic issues form the basis for a divergence in housing design preferences between the settlement types, I will now investigate the differences in the physical appearance of the housing in the two settlement types to determine if the elicited preferences represent wish or reality. Reviewing a series of photographs taken in the study settlements during the 1991 research, the principal task will be to correlate the statistically significant difference in housing design preference with the housing.

The tables and charts mentioned in this chapter may be found in the Appendix.

CHAPTER 7.

THE COMPARISON OF THE BUILT ENVIRONMENTS IN THE CASE STUDY SETTLEMENTS WITH ELICITED DESIGN PREFERENCES

The sole statistically significant design preference difference attributed to the four case study settlements was the Class / Economic / Social category (coded CLA). In the community-based settlements -- Palo Alto in Mexico City and UDEVHOR in Tlalnepantla -- the identified design preference was a concern for adequate housing evenly distributed to all residents in the settlement. Respondents described this design preference in terms of minimally sized housing designed and built to maximize housing for all residents. This sentiment was identified as having an ideological base. In the individualistic settlements -- Santo Domingo in Mexico City and Reforma Urbana in Tlalnepantla -- the emphasis was, in contrast, not on the well being of the community, but rather on economic issues of housing in the city.

This chapter will investigate whether or not these design preference differences are reflected in the built environments of the case study settlement types. The photographs included in this chapter are representative

houses in the case study settlements. An analysis correlating these photographs to the CLA design preference category follows.

Photographs

Photographs in the Appendix will be utilized in the analysis of the correlation of the settlement built environments to the design preferences noted in the previous chapter on heuristic elicitation research on housing design preferences. A brief description of each photograph follows. All photographs, with the exception of 1 CB and 2 CB were taken in 1991. 1 CB and 2 CB were taken in 1986.

From Community-Based Settlements:

1 CB. Taken at the community sports field at Palo Alto, the view is of an automobile way with identical housing units aligned at the road. (The mural to the left commemorates Rudolfo Escamilla.)

2 CB. Taken at the court yard of the church at Palo Alto, the views shows typical housing units in the background.

3 CB. View of a typical Palo Alto housing unit, taken from a pedestrian way.

4 CB. A side view of the typical Palo Alto housing unit.

5 CB. A view of UDEVHOR attached housing units seen from an up-hill view.

6 CB. A view of UDEVHOR attached housing units seen from a down-hill perspective.

7 CB and 8 CB. Identical bedrooms in different units at Palo Alto.

From Individualistic Settlements:

1 IND. A house in Santo Domingo with an enclosed garden.

2 IND. A house built of brick in a style the owner felt replicated 'Spanish Colonial.' It includes brick arches and inset stones of volcanic lava. It is located in Santo Domingo.

3 IND. A house of stone, precast balcony balustrades, marble veneer, and wood. It is located in Santo Domingo.

4 IND. The entrance to a house in Santo Domingo which exhibits through its iron gate the residence beyond and the large new car.

5 IND. A house in Reforma Urbana which has a shrine to the Virgin of Guadeloupe surrounded by painted doves and painted emblems. Upstairs a series of bedrooms front onto a balcony, and have a view of the Tlalnepantla valley.

6 IND. A walled in housing unit at Reforma Urbana with a courtyard containing trees and vines. The various rooms of the unit front onto the courtyard. All is hidden from street view by the front wall.

7 IND. An interior view of an house in Santo Domingo showing a working courtyard and a external toilet room.

8 IND. A housing unit in Santo Domingo constructed of cartón, corrugated bituminous impregnated cardboard, stone and scrap wood.

9 IND. A house unit in Reforma Urbana. It is built of laminated cardboard, scrap tin and wood. The interior has a dirt floor, two beds, and an extension cord for electricity.

Community-based Settlements

The photographs of the building facades of Palo Alto show that identical units are utilized throughout each settlement. Although minor design modifications of the buildings' exteriors can be seen, all units are essentially identical.

On the interior, the units are also identical. Differences in occupant / builder personalities and expendable income result in differences in adornment, furniture arrangement and selection. The units, however, are architecturally identical.

Similar correlations exist at UDEVHOR. The exterior designs of the units, different from those in Palo Alto, are identical designs (again with minor modifications) as are the interior spaces.

Photographs 1 CB through 6 CB, inclusive, show exterior similarities of dwelling units; photographs 7 CB and 8 CB show interior similarities of the typical upstairs bedroom spaces; and the sketches of the typical units for Palo Alto (Sketch 1 PA) and for UDEVHOR (Sketch 1 UDEVHOR) show the typical floor plans and sections of the replicated units. (The sketches are located in the Appendix.) The plans are rationally designed with no wasted space. This can be seen in the UDEVHOR plan where there is no hall space, and where the plumbing wall is shared by the adjacent unit for economy. Furthermore the slope of the site is maintained by the stepped levels within the units to avoid expensive landfill and excavation costs. In the

Palo Alto units, rational planning can be seen in the absence of hall space and the tight configuration of the basic unit.

Individualistic Settlements

In contrast to the similar designs utilized in the community-based settlements, the built environments of the individualistic settlements are composed of housing units built by individuals acting on their own in the city. The facades shown in the individualistic settlements photographs exhibit varieties in the designs.

In Santo Domingo and in Reforma Urbana the photographs show the unique designs which have evolved. Photographs 1 IND through 6 IND, inclusive, show a series of differing designs built by those who have been able to build comfortable housing. These designs are unique and reflect occupant - builder sentiments. Photographs 7 IND, 8 IND and 9 IND show less successful houses in the settlements. They too are uniquely configured. No interior photographs are included because the interiors, like the exteriors, are clearly with architectural differences.

Correlation

This correlation of photographs to the two settlement types shows that community-based settlements have, indeed, focused their house building energies on the multiple production of a replicable, identical, housing unit that has been shared by all community members. The photographic documentation likewise suggests that individualistic settlement occupant-builders house themselves according to their success (of lack thereof) in the city. There is, then, a correlation of the CLA design preference distinctions to the built environment of the two settlement types: community-based and individualistic.

The next investigation will study these two differently designed and built environments to compare their housing consolidation levels.

CHAPTER 8.

ANALYSES OF HOUSING CONSOLIDATION LEVEL INVESTIGATIONS

The following analyses will discuss the community-based and individualistic case study settlement's housing consolidation levels for each city. The analyses will also compare the housing consolidation levels of the case study settlements within each city; the community-based settlements in Mexico City and Tlalnepantla; and the individualistic settlements in these cities.

Comparisons which cross cities are problematic because of unique circumstances specific to each city. As seen in the heuristic elicitation research, real differences in data were a product of physical layout and site parameters. Differences in housing consolidation levels between cities are not known, but it might be surmised that Tlalnepantla, being somewhat removed from the economic vitality of the Capitol, would offer fewer opportunities for private economic growth than Mexico City. Nevertheless, the similarities of the community-based settlement data and the generally similar data derived from the investigations of the individualistic settlements deserves exposition, even with these provisos.

The manner of comparison will be, first, a review of the housing consolidation level data for the settlements along with the graphs of these levels. Finally, statistical computations will be utilized to compare similarities and divergences of data between compared settlements. As previously mentioned, inferences from statistical tests must be limited to the populations of the case study settlements.

The housing consolidation levels are the product of house evaluations as discussed in the Research Methods chapter. The level of consolidation of each house is found in Tables CON - 1 and CON - 2. The computations for these consolidation levels are based on a room-by-room evaluation. Table CON - 17 contains several samples of the room-by-room evaluations. Additionally, a series of photographs are included in Table CON - 20 to allow for an assessment of the judged values as noted within this table.

Statistical Tests

To analyze the differences in housing consolidation levels between compared settlements in the two urban locations, a determination of equality of sample variance is first investigated. The F-statistic test (Hinkle et

al, 1977) is utilized. Unequal variances are established and inferred to the populations and the differences between the means are then studied by using a test which does not have the parametric assumption of equal population variances. The test commonly known as the Welch test (see Hinkle et al, 1977: 209-211) is utilized.

The word "significant" when used to define the findings of statistical tests contained herein means that the difference between the hypothesized parameter and the corresponding sample statistic is said to be statistically significant if the probability that the difference would occur by chance is less than the level of significance set a priori (Hinkle et al 1977).

Descriptions of Findings

Mexico City

Community-Based Settlement: Palo Alto

Housing consolidation levels in the community-based settlement Palo Alto are taken from a sample of 31 house inspections seen in Table CON - 1. Per Table CON - 3 (the ranked listing of the sample), 6.5% of these houses are in the 60 to 70 % consolidated category, another 6.5% are in

the 70 to 80% category, 22.6% are in the 80 to 90 % consolidated category, and 64.5% of the sample are in the 90 to 100% consolidated category. See, also Table CON-18 in the text¹.

The graph of these data, Chart CON-5, shows a strongly rising trend toward full consolidation. As seen in Table CON-3, the lowest level of housing consolidation in the sample is 62.3, the mean level is 90.5% and the highest consolidation level found is 100%. The standard deviation is 10.419.

Individualistic Settlement: Santo Domingo

Consolidation levels in the individualistic settlement Santo Domingo are taken from a sample of 30 house inspections seen in Table CON - 1. Tables CON-3 and CON - 18 describe the distribution of the levels of housing consolidation among the sample. As the graph in Chart CON - 5 shows, this is a much broader array of consolidation levels than in the community-based settlement. There is a decidedly less strong trend toward full consolidation than found in the community-based Mexico City settlement, Palo Alto.

1. All "CON - " Charts and Tables not included in the text of this chapter may be found in the Appendix.

Chart CON-18: Housing Consolidation Levels: Mexico City

Level of Housing Consolidation (%)	<u>% of the sample.....</u>	
	Palo Alto (Community-based (Settlement)	Santo Domingo (Individual- (istic Settle- (ment)
30-40		6.7
40-50		3.3
50-60		13.3
60-70	6.5	10.0
70-80	6.5	23.3
80-90	22.6	13.3
90-100	64.5	30.0
	100.1	99.9
n =	31	30
\bar{x} =	90.5%	75.4%
s =	10.419	18.418

As seen in Table CON-3 the lowest level of housing consolidation in Santo Domingo is 32.2% - much lower than Palo Alto's minimum of 62.3%; the mean level is 75.4% - lower than Palo Alto's 90.5%; and the highest level is 100%. The standard deviation is 18.418 - much greater than Palo Alto's 10.419.

Comparison of Santo Domingo Findings of 1991 to Ward's Findings of 1978.

The findings on Santo Domingo -- the Mexico City individualistic settlement -- when standing alone offer one pole of a comparison between the community-based and the individualistic settlements in Mexico City. They can, however, be more valuable for the study if it can be ascertained that these findings correlate to those documented in previous housing consolidation level studies conducted in Mexico City. It was, in part, for this reason that Santo Domingo was selected as the individualistic settlement in Mexico City.

Peter Ward, in his article on housing consolidation in Mexico City (Ward 1978) provides evidence that consolidation levels increase over time in settlements of individual households. To generalize, he finds the following:

	Settlement age:	3yrs.	14yrs.	26yrs.
		=====		
Consolidation level				
A) 'Consolidated'		0%	23%	71%
B) 'Consolidating'		33%	72%	30%
C) 'Incipient'		68%	6%	0%

Total		101%	101%	101%
(modified from Ward 1978:41)				

An inspection of this truncated chart of Ward's data reveals a diagonal line of high percentages rising from 'Incipient' to 'Consolidated' as settlement age increases. Even though Ward (1978) cautions that these three levels should not be seen "as part of a single unilinear development trajectory" it is difficult not to infer that, over time, houses tend toward higher consolidation levels.

Variations in Research Data.

As an architect, my approach to evaluating housing consolidation levels was to inspect the various levels of finish in and out of the houses as well as to determine the level of provision of services such as plumbing and electricity within the house². Ward's approach differed from this focused architectural evaluation. He included, to be sure, those elements which I inspected but added other elements to "housing": furnishings and automobiles, type of employment; and external elements of urban infrastructure such as street paving, forms of water supply, electrical, and drainage systems.

2. The research method is described in the chapter on research methods.

My approach more pointedly relates to the house of the occupant - builder. This is not said to detract from Ward's research, but simply to recognize my concentrated focus. Certainly Ward's view includes peoples' abilities to influence the provision of infrastructure over time. He also appreciates that some people might find it more important to funnel expendable cash toward furnishings or automobiles than toward wall finishing, water piping, interior doors, or other building-related improvements. His research indicates that "the degree to which self-help housing alternatives will be successful is dependent upon the wider socio-economic structure." (Ward 1978:47). And while my focus is strictly the house, it too recognizes that the house is "dependent upon the wider socio-economic structure."

Correlating Ward's data to my data is an exercise which can provide a level of reliability with respect to the study. To the extent that the data generally coincide, the reliability of this study is improved (Denzin 1978:105; Bailey 1978:290), and Ward's contention that consolidation levels rise over time would receive additional independent confirmation.

Santo Domingo was 20 years old in 1991. Extrapolating Ward's data, a settlement of 20 years of age might have 47% of its housing stock 'consolidated' and 51% of its stock 'consolidating' and 3% of its stock as 'incipient'.

Santo Domingo: Correlation of Extrapolated Housing Consolidated Levels from Ward (1978) to 1991 Data.

Ward categories	1991 data	% of settlement from 1991 data	extrapolated percentages (from Ward)
'Incipient'	0% to 49%	10%	3%
'Consolidating'	50% to 79%	46.6%	51%
'Consolidated'	80% to 100%	43.3%	47%

Based on a review of the collected data, I correlated Ward's categories of 'incipient', 'consolidating', and 'consolidated', respectively with 0-49%, 50-79%, and 80-100% from my 1991 data on Santo Domingo. This is to say that consolidation levels from 0 to 49% were judged to be 'incipient', 50 - 79% were judged to be 'consolidating', and that the 80 - 100% data were judged to be 'consolidated'. These judged intervals are based on my observation of Santo Domingo housing. Houses with less than a 49% level of consolidation usually lacked significant services and finishes. Houses with consolidation levels from 50% to 79% had more services but often lacked final electrical

lines, internal doors, quality finishes, etc. Those houses with a consolidation levels of 80% and greater were considered to be, as broadly defined, 'consolidated.'

The probable percentages of the research data for the 'consolidated' category nicely falls near the extrapolated expectation (43.3% vs. 47%) and similarly, the 'consolidating' categories was extrapolated at 51% and fell at 46.6%. The 'incipient' category, at 10%, is worryingly higher than the 3% expectation, but the similarity of the 'consolidating' and 'consolidated' categories between the two studies confirms that the collected data (given the divergence of variables) generally reflects the consolidation data of Ward. Even though Ward's observations are from field research in 1973, the similarity of his study with the data of this investigation suggests a strong sense of reliability.

Comparison of Housing Consolidation Levels in Palo Alto and Santo Domingo

Chart CON - 5 compares the grouped housing consolidation levels of Palo Alto (the community-based settlement) with Santo Domingo (the individualistic settlement). While both settlements have a movement toward consolida-

tion, the community-based settlement -- clearly, with 64.5% of the houses in the 90 - 100% category -- have more consolidated houses than Santo Domingo where only 30% of the houses are within the 90 - 100% category. And while the community-based settlement's obra negra concept of minimum "shell" construction falls in the 60 - 70% level of consolidation range, Santo Domingo housing has almost 1/4 (23.3%) of its housing below this level.

A comparison of the standard deviations of the two settlements indicates that the individualistic settlement has a much greater variation about the mean than does the community-based settlement, Palo Alto. Santo Domingo's 18.418 is substantially greater than Palo Alto's 10.419. This, of course, merely reflects the wide variation of consolidation levels uncovered in Santo Domingo. And the mean for Palo Alto, at 90.5% is substantially higher than Santo Domingo's 75.4%.

Statistical Tests

The "F - statistic" Tests

A "F-statistic" test was conducted to determine if any statistically significant difference exists between the variances in housing consolidation levels of the two

settlements. The test, seen in Table CON - 13, concludes that the ratio of the variances of the two settlements is not likely (less than 10%) to have occurred by chance. Based on the statistical test, the community-based settlement has a statistically significant lesser amount of variance than does the individualistic settlement, suggesting that housing production within community-based settlements is less varied than housing in individualistic settlements.

The Welch Test

A statistical test called the "Welch" test was conducted to determine if any statistically significant difference exists between the average level of housing consolidation between the two settlements. Because of the rejection of equal population variances, this test does not assume homogeneity of variance. This test, seen in Table CON - 9, concludes that the probability that the observed difference between the sample means would have occurred by chance, if in fact the settlement populations have the same consolidation mean (the null hypothesis), is less than .05. Based on the Welch test, the community-based settlement has a statistically significant higher average level of housing consolidation in comparison to the individualistic settlement.

TlalnepantlaCommunity-Based Settlement: UDEVHOR.

Housing consolidation levels in UDEVHOR are taken from a sample of 27 house inspections³. 7.4% of the houses are in the 60 to 70% consolidated category, 25.9% are in the 80 to 90% consolidated category, and 66.7% of the sample are in the 90 to 100% consolidated category. See Table CON - 19 below and Tables CON - 2 and CON - 4.

The graph of these data, Chart CON - 6, shows a strongly rising line toward full consolidation. The lowest level of housing consolidation is 62.7%, the mean level is 89.6% and the highest consolidation level found is 97.2%. The standard deviation is 8.541.

Individualistic Settlement: Reforma Urbana.

Consolidation levels in Reforma Urbana are taken from a sample of 30 house inspections. Table CON - 19 below (and Table CON - 4) indicates the distribution of the levels of housing consolidation among the sample.

3. As noted elsewhere, the 27 houses represent the total population of community-based occupant-builder households in the case study settlement.

Table CON-19: Housing Consolidation Levels: Tlalnepantla

level of housing consolidation (%)	<u>% of the sample.....</u>	
	UDEVHOR (Community-based Settlement)	Reforma Urbana (Individual- istic Settle- ment)
10-20		3.3
20-30		3.3
30-40		10.0
40-50		3.3
50-60		23.3
60-70	7.4	10.0
70-80	-	30.0
80-90	25.9	13.3
90-100	66.7	3.3
	100.0	99.8
n =	27	30
\bar{x} =	89.6%	62.9%
s =	8.541	18.777

The lowest level of housing consolidation in Reforma Urbana is 15.6%, the mean level is 62.9%, and the highest level is 92.7%. The standard deviation is 18.777. The graph of these data shows an erratic line with very little tendency toward the higher levels of consolidation. See Table CON - 4 and Chart CON - 6. An inspection of the graph of these data in Chart CON - 6 shows a broad array of consolidation levels with no pronounced tendency toward higher consolidation. The data infers a lower level of housing consolidation in the 50% to 80% range.

A Comparison of Housing Consolidation Levels in UDEVHOR
and Reforma Urbana

Chart CON - 6 compares the distribution of the settlements' consolidation levels in a series of housing consolidation intervals (10% steps) for UDEVHOR and Reforma Urbana. UDEVHOR, the community-based settlement, contains a large quantity of highly consolidated houses. With 66.7% of the houses in the 90 - 100% category, it clearly outdistances Reforma Urbana, the individualistic settlement, where only 3.3% of the houses are within the 90 - 100% consolidation level category. And while the community-based settlement's obra negra concept of minimum construction lies in the 60 - 70% level of consolidation range, Reforma Urbana housing has not quite half (43.2%) of its housing below this level. UDEVHOR's upswinging graph indicates that there are more consolidated houses than less consolidated houses, whereas Reforma Urbana's graph traces a roller coaster line where the predominance of housing occurs in the mid-levels of housing consolidation. The brunt of Reforma Urbana's housing (63.3%) falls in the 50 - 80% housing consolidation range.

A comparison of the standard deviations of the two settlements suggests that the individualistic settlement has a much greater variation about the mean than does the community-based settlement. Reforma Urbana's 18.777 is decidedly greater than UDEVHOR's 8.541. And the mean for UDEVHOR, at 89.6% is considerably higher than Reforma Urbana's 62.9%.

The "F - statistic" Tests

A "F-statistic" test was conducted to determine if any statistically significant difference exists between the variances in housing consolidation levels of the two settlements. The test, seen in Tale CON - 14, concludes that the ratio of the variances between the two settlements is not likely (less than 10%) to have occurred by chance. Thus the investigation, with 90% confidence, finds that the difference in variance of housing consolidation levels between the two settlement types is dependent on the settlement type. Based on the statistical test, the community-based settlement has a statistically significant lesser amount of variance than does the individualistic settlement, suggesting that housing production within community-based settlements is more tightly concentrated about the mean than in individualistic settlements.

The Welch Test

A statistical test, commonly called the "Welch" test was conducted to determine if any statistically significant difference exists between the average level of housing consolidation between the two settlements. Because of the rejection of equal population variances, this test does not assume homogeneity of variance. This test, seen in Table CON - 10, concludes that the probability that the observed difference between the sample means would have occurred by chance, if in fact the settlement populations have the same consolidation mean (the null hypothesis), is less than .05. Based on the Welch test, the community-based settlement has a statistically significant higher average level of housing consolidation in comparison to the individualistic settlement.

A Comparison of Community-Based Settlements in Mexico City and Tlalnepantla: Palo Alto and UDEVHOR.

A review of the housing consolidation level data on the two community-based settlements shows striking similarities. The means for Palo Alto and UDEVHOR are, re-

spectively, 90.5% and 89.6%. The standard deviation for Palo Alto is 10.419 and for UDEVHOR it is 8.541.

The variances, with standard deviations of 18.418 and 18.777 are very close.

The means, at 90.5% and 89.6% are very close. Chart CON - 7 portrays the similar housing consolidation levels of these two settlements.

A Comparison of the Individualistic Settlements in Mexico City and Tlalnepantla: Santo Domingo and Reforma Urbana.

A review of the housing consolidation level data on the two individualistic settlements suggests that certain similarities exist, and that statistically significant differences, as mentioned earlier, do exist. The means for Santo Domingo and Reforma Urbana are, respectively, 75.4% and 62.9%. The standard deviations are very similar: Santo Domingo is 18.418 and Reforma Urbana is 18.777.

The "F-statistic" test which investigated variations between the two settlements concluded that the variation is by chance, and thus is not statistically significant. See Table CON - 16.

A T-test which investigated differences between the mean consolidation levels of the two settlements concluded that the variation between the means are not by chance, but are statistically significant. The means at 75.4% (Santo Domingo) and 62.9% (Reforma Urbana) along with Reforma Urbana's small number of highly consolidated houses suggests that Reforma Urbana lags behind Santo Domingo. This can be attributed to location. See Table CON - 12.

Chart CON - 8 graphically illustrates the two settlements' housing consolidation levels.

A visual review of this graph suggests that the major differences between the two settlements housing consolidation levels are that at Reforma Urbana in Tlalnepantla, there are much lower levels of housing consolidation and that very few houses were in the highest consolidation level interval of 90-100%. There is, as noted earlier, only a few houses (3.3%) at Reforma Urbana in the 90 - 100% consolidation level, whereas Santo Domingo has 30% in this interval.

Discussion

The case study community-based settlements have significantly different levels of housing consolidation when compared to the individualistic case study settlements. A review of all four case studies indicates that the two community-based settlements have consolidation levels which closely approximate each other. Their means are close, and the standard deviations are reasonably similar.

The individualistic settlements, however, while not statistically significant in their variations based on the F-statistic, do have statistically significant differences in their means as shown in the T-tests. As mentioned, these differences in the means may be related to location as Tlalnepantla clearly does not offer the economic advantages of Mexico City.

The difference in variation between community-based and individualistic settlement types is statistically significant on a city-by-city basis. The evidence indicates that community-based settlements contain higher levels of consolidated housing than individualistic settlements.

Based on discussions with occupant - builders in Palo Alto and UDEVHOR, it seems reasonable to conclude that their methods of design, obra negra community building, organization, financing, and personal finishing of private spaces are all variables which account for these settlements' higher consolidated housing levels. These methods differ drastically from the individualistic approaches found in Santo Domingo and Reforma Urbana. Such differences suggest that a more effective theory to lower-income urban housing provision can be offered in response to the different approaches to housing.

Having now presented the analyses for housing consolidation levels, along with the previous chapters analyzing other aspects of the investigation, the study now turns to consider the significance of the research.

CHAPTER 9.

RESEARCH SIGNIFICANCE

Introduction

The investigation has described and explained self-help lower-income housing differences between community-based and individualistic settlement types in four case studies in two Mexican cities. The three areas studied are: 1) builder - occupant housing design preferences; 2) the portrayal of visually significant design preference differences in the built environments of the case study settlements; and, 3) the differences in housing consolidation levels between settlement types. The research suggests that these housing settlement types -- community-based and individualistic -- are environments where respondents produce different housing design preferences, where housing is built to correlate to these preferences, and where statistically significant different housing consolidation levels occur.

In comparing community-based settlements to individualistic settlements, the research has specifically identified that in community-based settlements, there is a decided housing design preference for evenly distributed

housing among the settlement's population. This preference is not shared by occupant - builders in the individualistic settlements who prefer to cope with individual economic issues of housing.

A review of the built environments of the case study settlements suggests that the statistically significant design preference differences are reflected in the constructed domiciles of the occupant-builders. In the community-based settlements it was seen that identically designed units were reflective of an ideology of constructing minimum sized units and distributing these to all community builders and, in contrast, the individualistic settlement houses were uniquely designed to each household's finances, abilities and personal preferences. These design preference differences related to the housing consolidation level differences between the two settlement types.

It was discovered, with respect to housing consolidation levels, that in community-based settlements, the lowest level of housing consolidation is higher than in individualistic settlements. The concept of "shell" or "obra negra" building allowed residents to move into a residence where the initial level of consolidation was at a 60% to 70% level. This compares favorably with individ-

ualistic settlements where as much as 23.3% of the Mexico City individualistic settlement and 43.2% of the Tlalnepantla individualistic settlement live in housing with consolidation levels below this community-based settlement entry level.

For each city, the average consolidation level is higher in community-based settlement than in the individualistic settlement. In Mexico City, the community-based settlement Palo Alto had a mean of 90.5% compared to 75.4% in Santo Domingo; and in Tlalnepantla the community-based settlement UDEVHOR had a mean of 89.6% compared to 62.9% in Reforma Urbana. The probability that these differences in the means -- 15.14 in Mexico City and 26.74 in Tlalnepantla -- would have occurred by chance if the population means were the same is less than .05.

A closer viewing of community-based settlement housing consolidation levels shows that there are a greater percentage of houses in the most highly consolidated levels of 90 to 100% than in individualistic settlements. For example, in Palo Alto, 64.5% were in this highest rank compared to only 30% in Santo Domingo. Likewise, in UDEVHOR 66.7% of the sample can be compared with only 3.3%

in Reforma Urbana. Clearly, the community-based settlements produce more highly consolidated housing than the individualistic settlements.

In the Mexico City case study settlements, there is less variance about the mean in the level of housing consolidation in the community-based settlement, Palo Alto, than in Santo Domingo, the individualistic settlement. The wide difference in variations in consolidation levels in Palo Alto and in Santo Domingo are reflected in variances of 105.05 and 327.92, respectively. The probability that the ratio of these variances, $327.92/105.05 = 3.12$, would have occurred by chance if, in fact, the population variances are equal is less than .10.

And in the Tlalnepantla case study settlements, there is less variance about the mean in the level of housing consolidation in the community-based settlement, UDEVHOR, than in Reforma Urbana, the individualistic settlement. The wide difference in variations in consolidation levels in UDEVHOR and in Reforma Urbana are reflected in variances of 70.25 and 340.83, respectively. The probability that the ratio of these variances, $340.83/70.25 = 4.85$, would have occurred by chance if, in fact, the population variances are equal is less than .10.

It is clear that the mean of the level of consolidation of housing in community-based settlements is higher than that found in the individualistic settlements in the two cities studied. And it is also clear that in community-based settlements there is less variance in consolidation levels about the mean than in individualistic settlements.

This study challenges the theory that individuals, acting on their own, are -- by and large -- successful at integrating into the economy of developing capitalist cities as seen by the housing consolidation levels found in the individualistic settlements. The data suggests that while some individuals in these settlements do achieve a highly consolidated house, many individuals do not achieve such housing. Community-based settlement housing, in contrast, has been shown to have a higher level of consolidation and with most of the housing units having similar levels of consolidation. The implication for a theory of lower-income housing in developing countries is that the community-based settlement is more effective at the production of lower-income self-help housing than the individualistic settlement.

Both the community-based and the individualistic settlement types have different ways of building and different preferences for housing design. The study uncovers a strong community-based settlement preference for designs intended to distribute housing space among community-based occupant-builders and to distribute the cost of building by designing minimum shelters for all participants. Individualistic settlements, in contrast, are populated by uniquely designed buildings which, as constructed, reflect the economic prowess (or lack thereof) of the occupant-builders.

Design

As the research suggests, the community-based settlements create shelter in a method superior to that found in individualistic settlements. It utilizes specific housing design strategies as a vehicle for community solidarity and for higher levels of consolidation than the design method discovered in individualistic settlements. There are several critical components of these design strategies which aid in the production of community-based settlement housing.

First, at the inception of the settlement, there is rational planning by design professionals. Economical housing designs are created to be equally shared among all occupant-builders. There is a maximum utilization of space, minimum utilization of materials, and simple means for self-help construction by inexperienced builders. A review of the photographs of Palo Alto and especially UDEVHOR shows, though, that the simplest of construction methods still require skill. Design professionals, as might be expected, devoted considerable hours to on-site instructions¹.

As part of this rationalist and economic design approach, the replication of house designs was an important component of settlement development. The same design was utilized throughout each community-based settlement to gain economies of scale. The repetitious construction sequences for self-building enhanced the productive capabilities of people with limited construction experience. Equal spaces for each family are justification for replication as is the symbolic benefit of a unified community living in a unified built environment.

1. Comment of former professional involved with the projects.

And lastly, equal access to housing by all community-based settlement participants was an element of the settlements. No participating family was excluded from receiving a house if they had contributed to the construction effort, assumed financial obligations, and became part of the settlement's organization. Some must wait longer than others as each wave of "sorteos" or the lottery-like parceling out of housing occurred. In time all participants gain obra negra housing shells.

Because the study is composed of case studies, it is limited to the analytic generalization to theory. Furthermore, additional limitations are as follows: the specific cases are in highly urbanized parts of Mexico and may not be appropriate for theoretical constructs in less urbanized areas; the community-based settlements studied herein were, as part of their organization, able to secure external funding and professional expertise: the extrapolation to other community-based settlements without such resources would be incorrect.

Theory

Previous researchers of the production of lower-income self-help housing in urban areas of developing countries had focused almost exclusively on legalized versions of squatter settlements where individuals do or do not, succeed in the city.

Early observers of lower-income self-help housing such as Abrams, Mangin and Turner saw these squatters as efficient house builders in a frugal urban economy. John F. C. Turner theorized that the knowledgeable actions of individuals were to be preferred over state sponsored housing or large corporation built housing (Turner 1972, 1976). He suggested that the individual occupant-builder knew with great intimacy his or her own financial resources, the costs of scrap and new building materials, and could, alone, best make those design and financial decisions which would provide urban shelter in the developing world.

Lisa Peattie, too, showed in The View from the Barrio (1968) the practical and survivable life of the poor in the shantytown appendages to urban areas in the developing Third World.

Based on an ideological molding of Turner's and others ideas by the World Bank (1974), the US Agency for International Development, and others, lower-income self-help housing programs came to assume a pro-capitalist system of indoctrination of the poor into the developing city. These policy-making political-economic institutions sought to create the proper disposition for participating lower-income citizens in the capitalist city while minimizing capital outlay. The intent, based on Turner's work, was to indoctrinate these urban participants into the self-help micro-management ethic of survival in the overall stringency of the developing city's economy.

This system for housing would, it was presumed, establish conditions whereby the new poor of the city would not engage in revolutionary actions against the state². Rather, lower-income citizens would fold into the system of capitalist development. It was, indeed, suggested by a World Bank employee that this system worked "naturally": the urban poor desired nothing more than access to western concepts of the middle class life and in the city they would succeed (Salmen 1987).

2. The timing of the policy development was shortly after -- and reactive to -- the Cuban Revolution of 1959, and the establishment of guerrilla units in Venezuela, Colombia and elsewhere.

For years, the evidence on the success of lower-income self-help housing settlements seemed to support this approach to lower-income housing. Squatter invasions gave way to pirate subdivisions (Carroll 1980; Gilbert 1981), and the states readjusted from a confrontational stance to a cooptative one. As the state managed these settlements, all that was needed -- so went the supposition -- was time for economic development. Tentative housing units were to give way to more substantial housing units. Extra rooms were to be built so that, as entry level entrepreneurs (Burgess 1980, 1982) the poor could live better by providing rental units for their own.

Ward's study of Mexico City housing (Ward 1978) seemed to infer that time did, indeed, lead to housing completion. House units tended toward higher consolidation levels as settlements matured.

But cursory walks through older settlements seemed to belie this theory of a successful -- if lengthy -- integration into the developing city. Behind walls and sometimes on the street, it was found that houses over 15 years of age appeared not to have been the site of consol-

idation activities over time. And in many units with imposing facades, the interiors were sometimes without finish, infrastructure, and other improvements.

There was a suspicion that the urban environment was probably not evolving as anticipated. Perhaps stagnation had occurred, perhaps large debtor payments and IMF-imposed wage scales were holding down the development of lower-income settlements in the city. Whatever the causes, it seemed that the Abrams - Turner - Peattie - World Bank model of self-help lower-income individual settler incorporation into the urban dynamic was probably not working as effectively as anticipated.

The growth of an alternative model, the community-based settlement, in recent years allows a comparative viewing of the individualistic settlement. This study investigates this other approach in a comparative manner and shows that the community-based settlement is a more productive method for the provision of lower-income self-help urban housing than the model of individuals acting in their own best interests in the city.

In the study of neighborhood communities such as the community-based settlement, Friedmann and Salguero (n.d), Mainwaring (1985,1986), Singer (1982) and others suspect that these community-based settlements³ will only remain viable for as long as their members are recipients of inadequate compensation. Evidence at Palo Alto does, indeed, suggest that some economically successful residents would leave the settlement if only they could receive a market-based exchange value for their house. But these residents represent only a small proportion of the settlement. The remaining residents -- including both successful and unsuccessful participants in the economy of the city -- choose to stay. Moreover, many of their children (some with university training) elect to remain and to self-build in a manner similar to their parents. Based on conversations with residents, they wish to stay within community-based settlements for a number of reasons.

3. They refer to barrios, mutual aid societies, etc.

Firstly, they recognize that the community-based settlement's ideological concept about housing has given them better housing than that available through individual action. They recall their past inability to control access to "dignified" shelter, and they recognize that the community-based settlement was the means by which they acquired their present housing.

Secondly, they recognize that the economics and mutual participation of the community-based settlement has resulted in more consolidated housing than in individualistic settlements. They were able to borrow capital, and to effectively utilize this capital as a group.

While the two preceding comments about community-based settler reasons for remaining in the community relate to observable facts about community-based housing, there are other issues which makes the settlement a preferable place to live in the city. These include the following: The ever increasing scarcity of affordable land elsewhere in the city results in land price increases which require that people move yet further away from the city's center.

And, from a personal perspective, many residents prefer to remain among friends, to be near one's family, and to live in a safe and known environment.

Thus the advantages of the community-based settlement are recognized as being valuable by the occupants. This acceptance suggests that the community-based settlement is indeed more permanent than inadequate compensation and other negative economic factors might have earlier suggested to Singer and Friedmann and Salguero.

The findings of the research suggest that the community-based form of lower-income self-help urban housing is more effective in the production of housing. This contrasts with the personal initiative policies promoted by the World Bank (1974), Mitchell and Turner (1967), the USAID and its consultant PADCO (1984), and the World Bank employee Salmen (1987). As discussed in the literature review chapter, these organizations and authors promote a form of lower-income housing wherein individuals interact within city to secure their niche.

The determination that community-based housing settlements have more highly consolidated housing with less variation than individualistic housing settlements sug-

gests that the investigatory groundwork of Mainwaring (1985, 1986), Singer (1982), and Friedman and Salguero (1987) supports an effective settlement form for enhanced housing production and enables the development of an alternative theory for lower-income self-help housing to that espoused by such entities as the World Bank and USAID.

Friedmann and Salguero illustrate, in their discussion on the barrio economy, the internal and external dynamics between mutually-aided barrios and the capitalist city in Latin America. Because their drawing addresses general economic relations which apply equally to community-based settlements, I have modified it to reflect community-based housing production. See the sketch "Community-Based Settlement Housing Production in the City" in the Appendix.

In this sketch, I portray the community-based settlement as a community organization with households grouped into work parties for housing production. Often external agents such as a church, a workers' union, or perhaps a political movement provide professional and/or financial services. Individual households continue to interact in the formal- or informal- sectors of the exchange-value

infused city. However they simultaneously undertake community-based use-valued work in the production of housing.

They exist, then, in two separate spatial / economic zones: the use-valued community-based settlement, and the exchange-valued city. This dual occupancy occurs with no more conflict with the state than any other lower-income housing settlement might experience. The community-based settlement appears as adept as their individualistic cohorts in securing infrastructure services from the state. Separate spatial - economic zones do not, however, indicate that there is one totalizing reality. Rather, there are two intermixed zones. There is a commingling of the two spaces and economies which make community-based housing possible.

Both exchange-values and use-values are operative for the community-based settlement. Use-values focus on actions of community concern for shelter within the settlement. Exchange-values, in contrast, are the lingua franca of individual action in the capitalist city, and community-based residents willingly participate in the buying and selling activities within the city. These intermixed relationships between the community-based

settlement and the capitalist city, however, are not static but dynamic: not only do they exist simultaneously, but they change over time. To portray these changing relationships between the city and the settlement, I diagrammatically sketch the development of a prototypical community-based settlement in a drawing entitled "Dynamics of Community-Based Settlement Housing Development in the City." The sketch is located in the Appendix.

In stage I on the drawing , the community-based settlement has its beginnings in land acquisition (by legal, illegal or quasi-legal means). Stage II portrays participants organizing to acquire and retain ownership of the land. Following the acquisition of land, the community organization formulates its methodology for community-based housing production. Problematic issues with the state are identified (official recognition of land tenure, political alliances, infrastructure provision, etc.); external agents provide professional services; housing production begins. And in contrast to individualistic settlements, the community elects to produce houses with legally restricted use-values in the capitalist city.

In stage III, the settlement moves toward a lasting relationship with the city, and houses are built (often in phases or "sorteos") to the minimum level acceptable for

occupancy. These building "shells" (or obra negra levels of construction) are then occupied and individually finished. The circumstances for finishing are somewhat dependent on individual success in the city, but true self-building and low-cost materials mitigate this scenario. The community's interaction with the state results in the initiation of urban infrastructure services.

The last stage, IV, represents a "stasis" between potentially opposing forces: the city and the community-based settlement: they develop a symbiotic relationship. The state taxes the individual households, sweeps individuals into political parties; the settlement's residents access the plethora of opportunities a city presents: work, education, health services, entertainment, and higher living standards. While the community settlement could be an "opposing" force in a Castellsian scenario, they elect, rather, to assume a non-opposing stance because it is in their collective best interest. Rather than rebel for "dignified" housing, they have resolved their housing needs on their own. By occupying space in both the community-based settlement and the capitalist city, they have a balance between the -- by now -- successfully consolidating settlement and the capitalist city. The balance is based on the practical foundations

of use-valued enterprise within the settlement, exchange-valued work in the city, state provision/negotiation of urban infrastructure, and the open access of the city for settlement members.

The salient features of the community-based settlement type, then, are as follows:

1. Lower-income populations, when organized in community-based settlements can not only house themselves, but can create higher consolidated housing than individualistic settlements.

2. Housing units are rationally designed for maximizing usable space, minimizing nonessential space, and creating easily built houses with repeated unit design distributed among residents. Construction is self-help on a community-wide level.

3. External agents provide access to professional services and capital. Products of organizing into a community-based settlement include access to professional design services, administrative services, as well as access to financing sources through such civil institutions as the Church, external governments, etc. Normally

none of these services are available to individuals or to groups of individuals in individualistic settlements because they are primarily acting as single households with limited incomes, capital and equity. These attributes have been available to community-based settlements because they -- unlike the individualistic settlers -- can present to would be funders the credentials of the professional advisers as well as to have in place lines of communication between grassroots Church (or union) organizers and established civil institutions such as the Church, unions, political organizations. The community-based settlements studied herein were aided with construction funds from such sources.

State organizations and international lending organizations may also provide capital⁴. In part, no doubt, this is due to the excellent record of pay-back associated with community-based settlements⁵.

4. Personal conversation with housing researcher in Mexico City, 1991.

5. Personal conversation with World Bank housing official, 1986.

4. Members of the community are continually positioned to access two worlds: they may take from the capitalist city as they can afford and from the community-based settlement as they need. In this form of urban existence, they pragmatically cross between a series of oppositions which are not exclusionary:

Oppositions:

the capitalist city	community-based settlement	(opposition attributed to)
exchange-value	use-value	Marx
economy of infinite wants	community of limited needs	Friedmann & Salguero
exploitation	empowerment	Schuurman Burgess

Individualistic Settlements and the City

The dynamics of the classic invader settlement⁶ in the city offers a comparison to the actions of the community-based settlement. The sketch "Dynamics of Individualistic Settlement Housing Development and its Relationship to the City" at the end of the chapter portrays various stages of this settlement type's incorporation into the city. Stages range from desire for land acquisition to integration of economically successful households into the fabric of the city.

In the first stage, as in the community-based settlement, individual participants come together to finesse land acquisition. In the second stage, the participants divide the acquired land among themselves. Contentions with the state over infrastructure are addressed by organized settlers. By the third stage, the problems with the state have been negotiated to the point where the state accepts the settlement's existence and begins to provide access to limited services. By this time house construction has begun, and early, illegal housing -- tentatively

6. Pirate subdivision or similar other modes of land provision included.

built in a reflection of the settlement's unstable tenure -- becomes infused with exchange-value. While research in Santo Domingo and Reforma Urbana indicates that some houses may not consolidate much beyond this initial stage, nevertheless, many households eventually acquire sufficient capital and they undertake the consolidation of their houses.

Stage IV shows consolidating houses integrating into the city, and that the by-now unused settlement organization starts disbanding. Finally, in stage V, (perhaps a mythical stage) there is a total loss of organization and the settlement's sense of itself as an historical entity. Individual households, now financially successful in the city's economy, spatially integrate into the city. As households "move up" in the economy of the city they move out of their toe-hold "slum of hope" and move on to other, more attractive, neighborhoods yet further infused with exchange value.

Comparisons

The major difference between these two housing settlement types is that community-based settlements opt to practice housing construction in a use-value mode, and build as a settlement; while the individuals within the

individualistic settlements consider their personally built (or contracted) houses to have exchange-value on the free market. This is not to deny these houses their use-value; but it is to say that they are often perceived as objects for sale on the market. Community-based settlement houses, in contrast, are not for sale on the open market.

The investigation compared housing in individualistic and community-based settlements and makes the following findings:

1. Differences between community-based and individualistic occupant-builder housing design preferences tend to focus on the economics of opportunities and constraints for individuation within the individualistic settlement; and on expressions of shared labor and materials to house the settlement population in community-based groups. This has been shown to be the ideology of a community which perceives optimum housing to be minimal in size and shared among all participants.

2. Built housing in the case study areas tend to have designs which reflect elicited design preferences noted in 1. above for both settlement types.

3. The production of housing in community-based settlements is a community effort augmented by outside aid from professional architects and administrators. Guidance from these professionals result in the efficient approach of shelter through rational design, economic material selections, simple construction techniques, management, and access to capital.

4. Housing consolidation levels tend to be higher in community-based than in individualistic settlements.

5. Community-based settlements create a stock of use-value housing capable of recirculation; individualistic settlement housing is also circulating, but as exchange-value in the city's markets.

Community-Based Settlements in the Developing Capitalist World

The community-based settlement does not provoke police or military action as did their more politically motivated counterparts during the 1960s. Rather than incite revolution, they emphasize the self-provision of housing within the city. By producing use-value housing stock they lower

their (and future occupant) remuneration demands because their costs for self-production are (and will be) lower than those who pay exchange-values for housing.

Wallerstein (1984) theorizes a world capitalist economy which integrates the Third World to the First World in three ways. First, the Third World is seen as a source for inexpensive raw materials needed in the production of exchange-value goods; second, it is seen as a source for inexpensive labor; and lastly, it is perceived as a source for new consumers for expanding markets. The community-based settlement does not attempt to restructure or subvert these capitalist expectations. By lowering the cost of the means for self-production through self-help building of use-valued housing, they lower their need for capital. If these lower costs are not known by the market, the capital surplus will accrue to community-based settlers. Capital so gathered, of course, could aid in grassroots development and subsequent growth of local, national and international market economies. Thus inhabitants would be able to more fully participate as consumers in developing cities.

Furthermore, by decreasing the quantity of poorly consolidated housing, the community-based settlement promotes more healthful living environments with the attendant positive results accruing to the state and capitalist market economies. Improved health levels have been correlated to housing improvements and the resultant higher work attendance and less expense to the state for ill residents by Burns and Greber (1977).

Marxists such as Burgess (1980, 1982) decry self-built housing as a form of super-exploitation. They expect the state to mandate the sheltering of people through adequate compensation. However just this view may be, it is beyond the scope of this study. More to the point for housing lower-income populations, though, is contention of Schuurman and Naerssen (1990) that self-empowerment of community-based settlements resolves the lack of housing provision by taking its production upon themselves. They have utilized self-help building -- as the priest Rudolfo Escamilla is reported to have said -- "to live as dignified people in dignified housing."

The analyses of Turner, Mangin, Peattie and others who studied lower-income self-help housing since World War Two shaped an urban housing policy meant to integrate lower-income populations into the Third World city through self-

help efforts. Their analyses of poor people's actions posited lower-income settlements not as slums of despair but as "slums of hope." (Rappoport 1977, citing Peattie). This study shows that for many it is indeed a settlement of hope, but for almost one-quarter (23.3%) of Santo Domingo residents and not quite one-half (43.2%) of Reforma Urbana occupant - builders who live below the obra negra level of community-based housing, there is a superior form of housing hope: the community-based settlement.

The community-based settlement's approach to housing is an alternative course of action to individualistic settlements in developing cities in the Third World. Community-based settlers find it in their best interests to maintain lives in the dual realities of their settlement and the capitalist city. They have produced a housing design, production process, and product capable of serving lower-income populations. Their highly consolidated houses make a community which is a non-threatening and survivable presence in the city. The community-based settlement holds promise as an effective housing method for lower-income populations.

Additional studies are suggested by this investigation. The most salient would be the identification of the population of community-based settlements in Mexico along with companion individualistic settlements so that an investigation with statistical tests could be created to infer to this population. Others include the investigation of the roles of civil institutions and design professionals in the production of community-based housing, the possible positive role of governments in making funding available to civil institutions or settlements, the relationships between various community-based settlements and the city with a special focus on the level of autonomy achievable by the settlements. Yet other areas which might be considered for future study would be the assessment of pooled multi-settlement resources for the production of commonly used (and readily transported) materials and skilled craftspersons.

BIBLIOGRAPHY

- Abrams, Charles. 1964. Man's Struggle for Shelter in an Urbanizing World. Cambridge, Mass.: MIT Press.
- Alexander, Christopher. 1985. The Production of Houses. New York: Oxford University Press.
- Babbie, Earl. 1983. The Practice of Social Research. 3rd edition. Belmont, CA: Wadsworth Publishing.
- Bailey, Kenneth D. 1978. Methods of Social Research. New York: The Free Press.
- Bottomore, Tom, L. Harris, V. Kiernan, et al. 1983. A Dictionary of Marxist Thought. Cambridge, MA: Harvard University Press.
- Burgess, R. 1980. "Petty Commodity Housing or Dweller Control? A Critique of John Turner's Views on Housing Policy." World Development. 6, 9/10.
- . 1982. "Self-help housing advocacy: a curious form of radicalism. A critique of the work of John F. C. Turner." In Self-help Housing: a Critique. edited by P. Ward. London: Mansell.
- Burns, Leland and Leon Greber. 1977. Housing of the Nations. London: MacMillan.
- Camino, H. and R. Goethert. 1978. Urbanization Primer. Cambridge, MA.: MIT Press.
- Carroll, A. 1980. Pirate Subdivisions and the Market for Residential lots in Bogotá. Study Paper, no. 7, Washington: The World Bank.
- Castells, Manuel. 1980. The Urban Question: A Marxist Approach. 2nd edition. Cambridge, MA.: MIT Press.
- . 1983. The City and the Grassroots: A Cross-Cultural Theory of Urban Social Movement. Berkeley: Univ. of Calif. Press.
- CIAM. 1933. Die Wohnung für das Existenzminimum. Stuttgart: Julius Hoffman Verlag.

- Collins, Randall. 1984. Max Weber. Beverly Hills: Sage Publishing.
- Connolly, Priscilla. 1982. "Uncontrolled Settlements and Self-Build: What Kind of Solution? The Mexico City Case." In Self-Help Housing: A Critique. edited by Peter Ward. London: Mansell Publishing.
- Denzin, Norman K. 1978. The Research Act: A Theoretical Introduction to Sociological Methods. 2nd edition. New York: McGraw-Hill Book Co.
- Feagin, Joe R., Anthony Orum, Gideon Sjoberg. 1991. "The Nature of the Case Study." In A Case for the Case Study. Feagin, Joe R., Anthony Orum, Gideon Sjoberg, editors. Chapel Hill, N.C.: University of North Carolina Press.
- Frampton, Kenneth. 1980. Modern Architecture: A Critical History. New York: Oxford Univ. Press.
- Friedmann, John. 1989. "The Latin American Barrio Movement as a Social Movement: Contribution to a Debate." International Journal of Urban and Regional Science. 13, 3. September.
- Friedmann, John and Mauricio Salguero. (1987). The Barrio Economy and Collective Self-Empowerment in Latin America: A Framework and Agenda for Research. (mimeo). UCLA: Los Angeles.
- Gilbert, Alan. 1981. "Pirates and Invaders: Land Acquisition in Urban Colombia and Venezuela." World Development. 9,7,657-678.
- Goetz, Judith P. and Margaret D. LeCompte. 1984. Ethnography and Qualitative Design in Educational Research. San Diego, CA: Academic Press.
- GRES. 1985. Colonia Cooperativa Palo Alto 15 años de lucha. Mexico: n.p.
- Grindle, Merillee S. 1988. Searching for Rural Development: Labor Migration and Employment in Mexico. Ithaca, Cornell University Press.
- Harding, Joe. 1974. "Heuristic Elicitation Methodology and FRM Acceptability." Geneva: n.p.

_____. 1979. "Anthropology and Architectural Planning." Practicing Anthropology. 1, 5 & 6.

Harding, Joe R. and Livesay, J. M. 1984. "Anthropology and Public Policy." In Social Science and Public Policy: The Role of Academic Disciplines in Policy Analysis. McCall, G. and G. Weber, editors. New York: Associated Faculty Press.

Harding, Joe R. and Bonnie A. Nardi. 1978. "Determining Community Attitudes and Preferences for Programs and Services." Carolina Planning. 4, 1, (Spring).

Hinkle, Dennis E., William Wiersma, and Stephen G. Jurs. 1979. Applied Statistics for the Behavioral Sciences. Boston: Houghton Mifflin Co.

Kirk, Jerome and Marc Miller. 1986. Reliability and Validity in Qualitative Research. Beverly Hills: Sage Publishing.

Le Corbusier. 1967. The Radiant City. trans. Pamela Knight, Eleanor Levieux, Derek Coltman. New York: The Orion Press.

Lernoux, Penny. 1982. Cry of the People. (reprint) Middlesex, England: Penguin Books.

Lincoln, Yvonna, and Egon Guba. 1985. Naturalistic Inquiry. Beverly Hills: Sage Publishing.

Lomnitz, Larissa. 1977. Networks and Marginality: Life in a Mexican Shantytown. New York: Academic Press.

Mainwaring, Scott. 1985. "Grass Roots Popular Movements and the Struggle for Democracy: Nova Iguaçu, 1974-1985." Working Paper No. 52. Notre Dame, Indiana: Kellogg Institute.

_____. 1986. "Grassroots Popular Movements, Identity, and Democratization in Brazil." Working Paper No. 84. Notre Dame, Indiana: Kellogg Institute.

Mangin, W. P. 1967. "Squatter Settlements in Latin America: A Problem or a Solution?" Scientific American. 217, 4.

Marshall, Catherine and Gretchen Rossman. 1989. Designing Qualitative Research. Beverly Hills: Sage Publishing.

- McCall, George J. and J.L. Simmons, editors. 1969. Issues in Participant Observation. Reading, MA: Addison-Wesley Publishing Co.
- Miles, Matthew B. and A. Michael Huberman. 1984. Qualitative Data Analysis: A Sourcebook of New Methods. Beverly Hills: Sage Publications.
- Mitchell, Neal B. and Ian Donald Turner. 1967. "Squatter Housing: Criteria for Development, Directions for Policy." United Nations Seminar on Prefabrication of Houses for Latin America. Information Document No. 19. (reprint).
- PADCO. 1984. Site and Unit Design Handbook. Washington: USAID document PN-AAN-791.
- Patton, Michael Quinn. 1980. Qualitative Evaluation Methods. Beverly Hills: Sage.
- Peattie, Lisa. 1968. A View From the Barrio. Ann Arbor: Univ. of Michigan Press.
- Poniatowska, Elena. 1991a. Speech at Mount Holyoke College, South Hadley, Massachusetts, September.
- _____. 1991b. "And Here's to You, Jesusa." trans. Gregory Kolovakos and Ronald Christ. Hungry Mind Review. 19, Fall 1991.
- _____. 1980. Fuerte es el Silencio. Mexico City: Ediciones Era.
- Rappoport, Amos. 1977. Human Aspects of Urban Form: Towards a Man-Environment Approach to Urban Form and Design. London: Pergamon Press.
- Rubenstein, Joseph. 1981. "Photographic Facts; False Realities." Dialectical Anthropology. 5. 341-349.
- Schuurman, Frans J. and Ton van Naerssen. 1989. Urban Social Movement in the Third World. ed. Frans Schuurman and Ton van Naerssen. London: Routledge.
- Singer, Paul. 1982. trans. by Elizabeth Hansen. "Neighbourhood Movements in Sao Paulo." In Towards a Political Economy of Urbanization in Third World Countries. Helen I. Safa, editor. Delhi, India : Oxford University Press.

Sontag, Susan. 1978. On Photography. New York: Farrar, Strauss and Giroux.

Soto, Hernando de. 1989. trans. June Abbott. The Other Path: The Invisible Revolution in the Third World. New York: Harper and Row.

Spradley, James P. 1979. The Ethnographic Interview. New York: Holt, Rinehart and Winston.

_____. 1980. Participant Observation. New York: Holt, Rinehart and Winston.

Turner, John F. C. 1976. Housing By People: Towards Autonomy in Building Development. New York: Pantheon Books.

_____. 1972. "Housing as a Verb." In Turner, John F. C. and R. Fichter, editors. Freedom to Build: Dweller Control of the Housing Process. New York: Macmillan.

UCISV-VER. 1990. UCISV-VER Un movimiento que crece: Union de Colonos, inquilinos y solicitantes de vivienda de Veracruz. México: UCISV-VER.

Vivienda Cooperativa. 1982. Marcha Cooperativa, Supplement No. 11. México: Mesa de Estudios Cooperativos.

Wallerstein, Immanuel. 1984. The Politics of the World-Economy: The State, the Movements and the Civilizations. Cambridge: Cambridge University Press.

Ward, Peter. 1978. "Self-Help Housing in Mexico City: Social and Economic Determinants of Success." Town Planning Review, 49, 38-50.

_____. 1986. Welfare Politics in Mexico: Papering over the Cracks. London: Allen and Unwin.

_____. 1991. Review of Structures of power, movements of resistance: an introduction to the theories of urban movements in Latin America. International Journal of Urban and Regional Science. 15, 3.

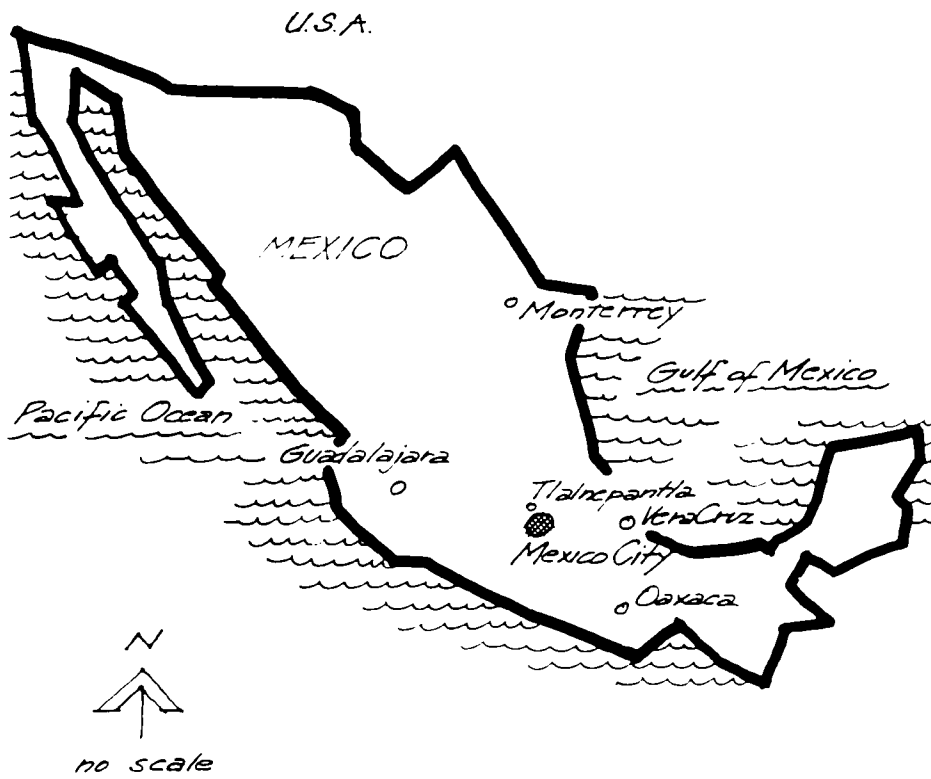
Werner, Oswald and G. Mark Schoepfle. 1987. Systematic Fieldwork. Vol. 1 (Foundations of Ethnography and Interviewing) and Vol. 2 (Ethnographic Analysis and Data Management). Beverly Hills: Sage Publishing.

World Bank. 1974. Sites and Services Projects. Washington: World Bank.

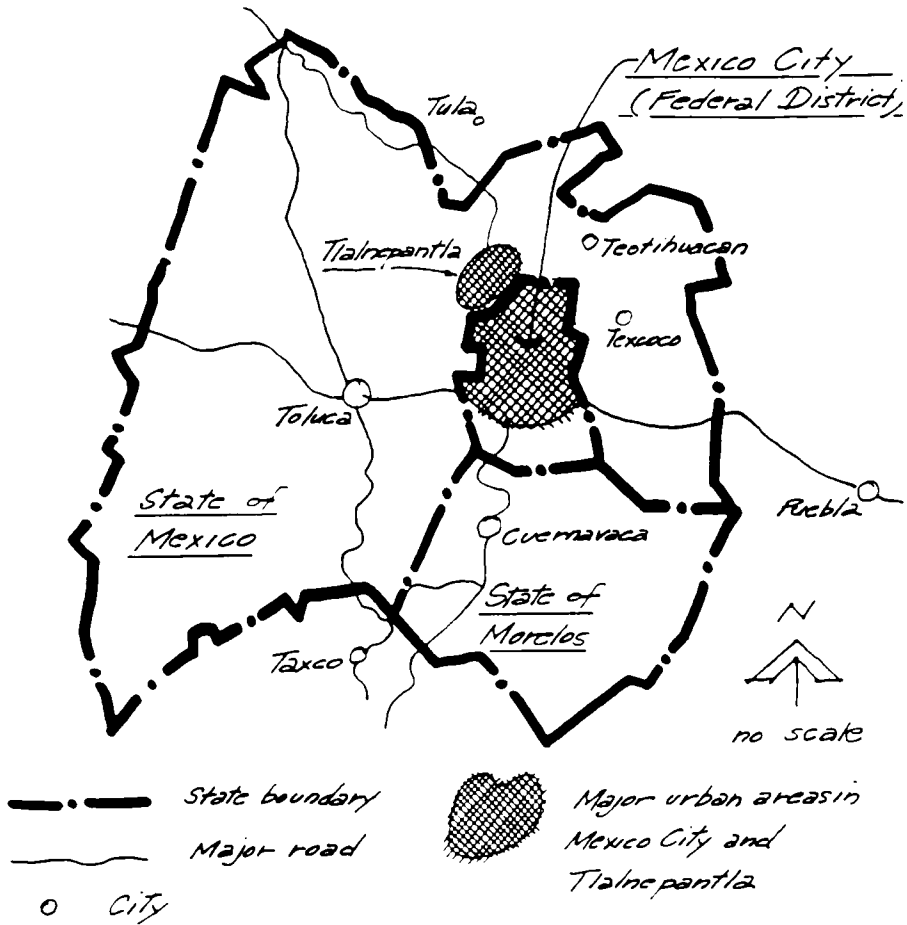
Yin, Robert K. 1987. Case Study Research: Design and Methods. Beverly Hills, Sage Publishing.

APPENDIX

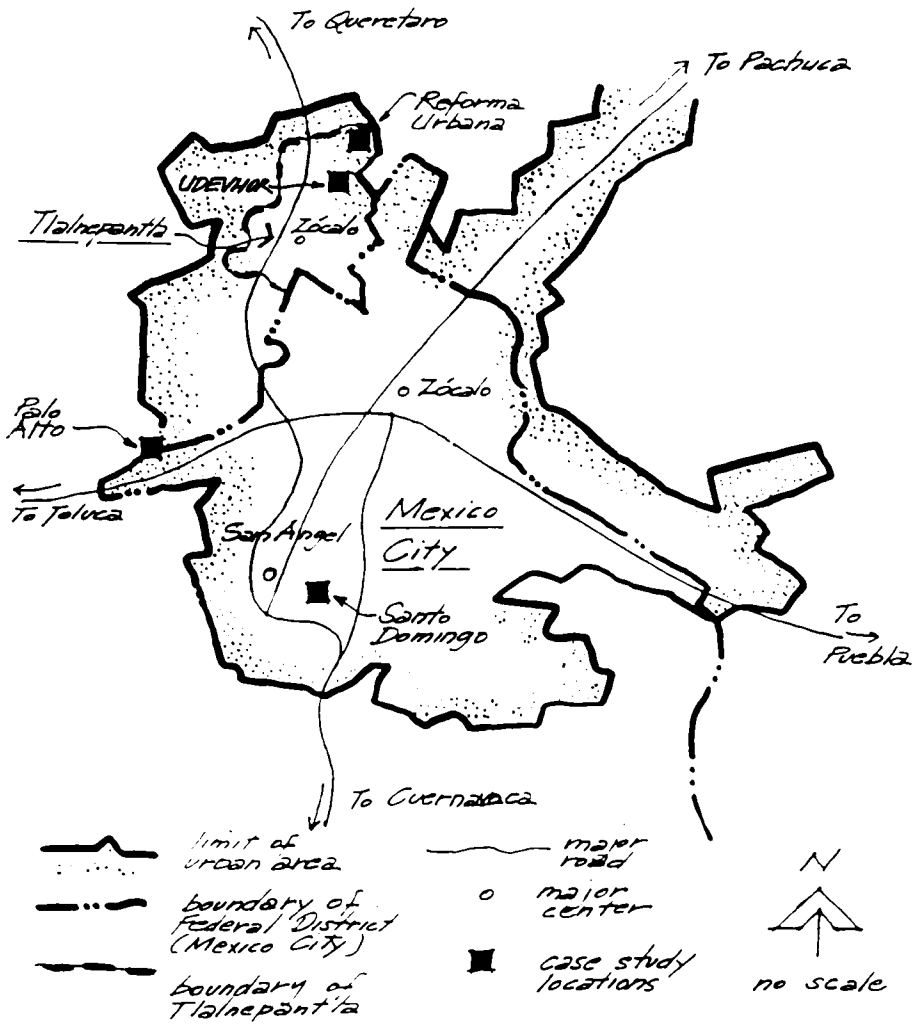
1. Map of Mexico Showing Principal Cities



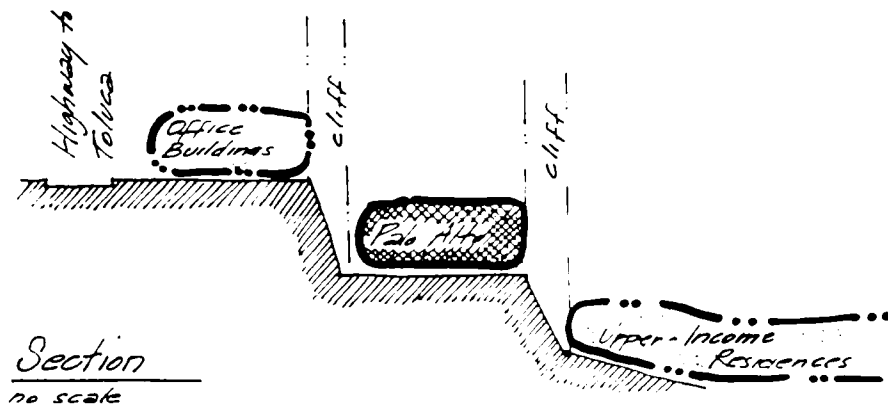
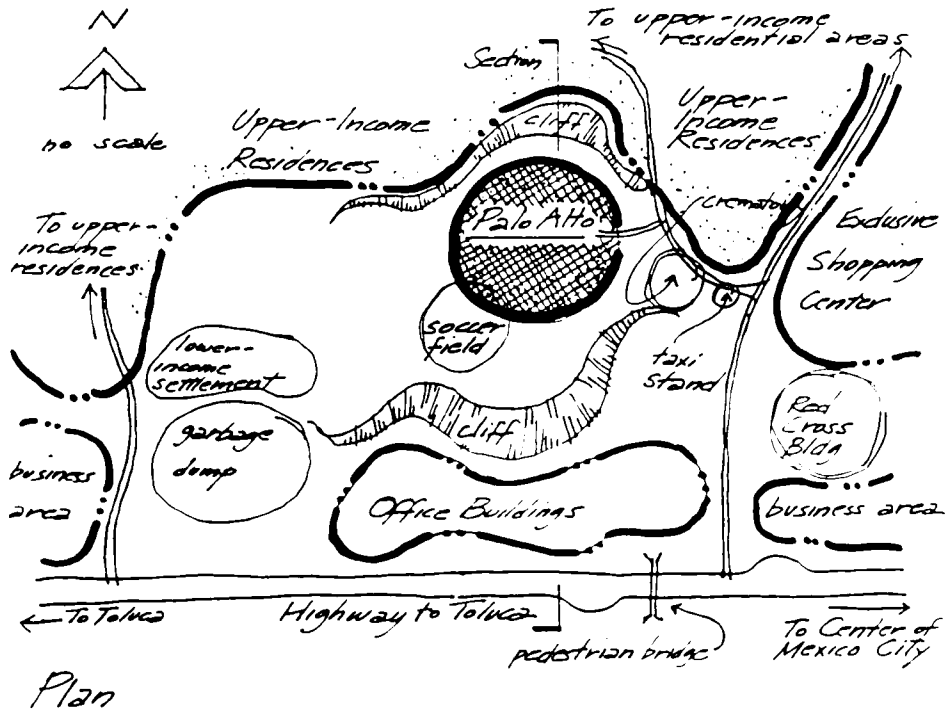
2. Map of Mexico City, The State of Mexico,
and Environs



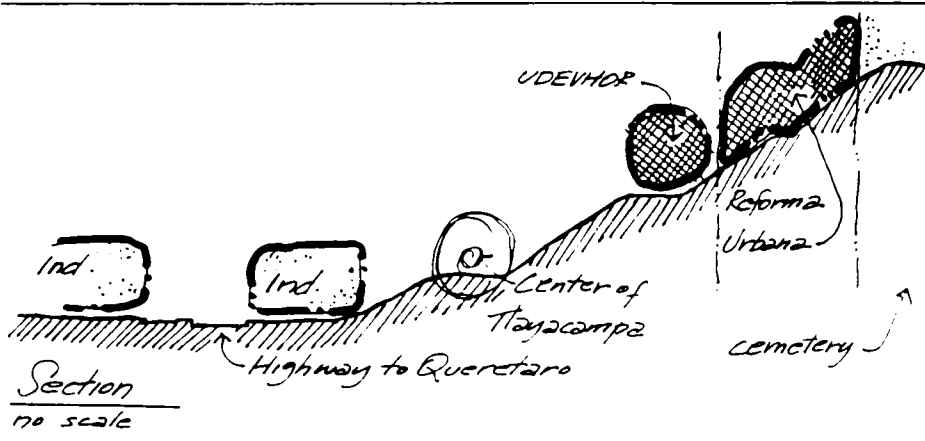
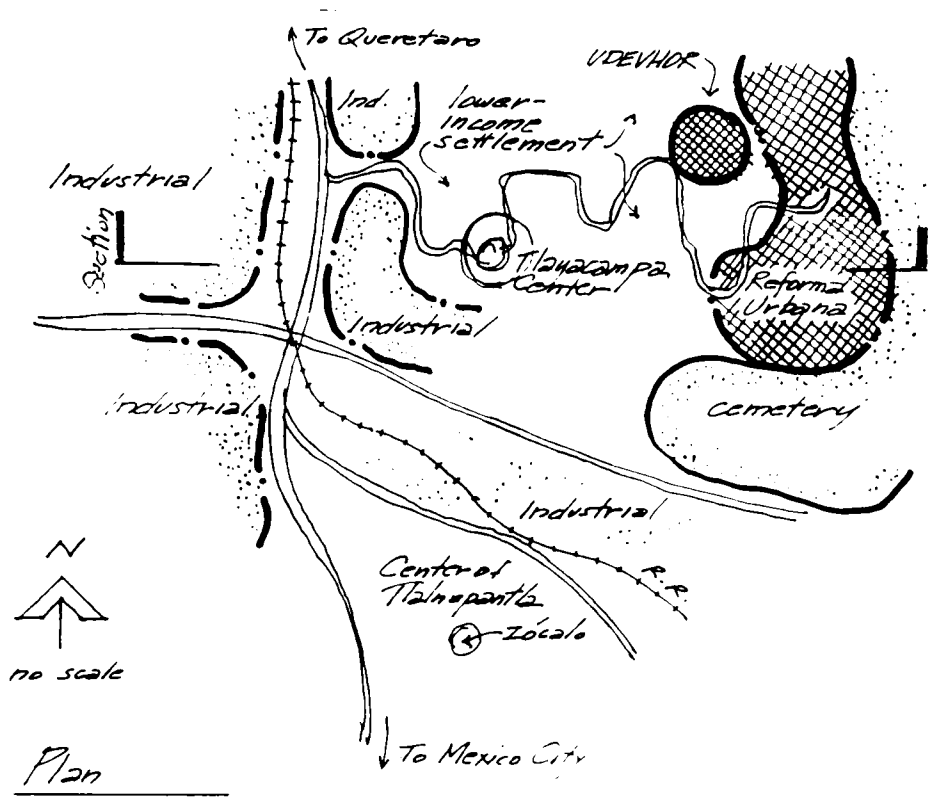
3. Map of Mexico City and Tlalnepanitla



4. Sketch Map and Section of Palo Alto
in Mexico City



5. Sketch Map and Section of UDEVHOR
and Reforma Urbana in Tlalnepantla



6. Heuristic Elicitation Methodology

Photographs No. 1 and No. 7



7. Heuristic Elicitation Methodology

Photographs No. 29 and No. 30

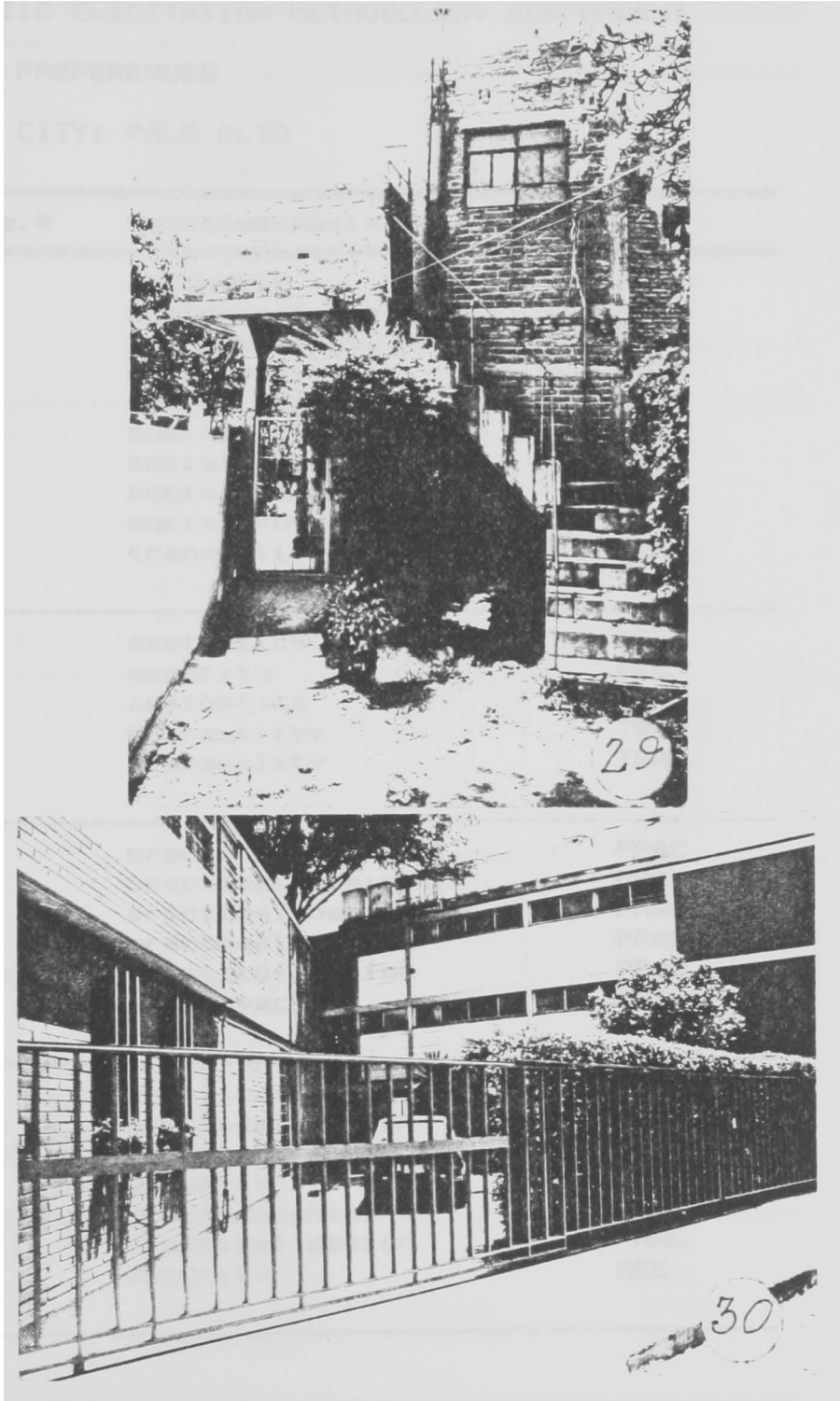


TABLE HEM - 1

HEURISTIC ELICITATION METHODOLOGY RESPONDENT

DESIGN PREFERENCES

MEXICO CITY: PALO ALTO

Hse.#	Response/Analysis	Code
1.	aesthetic	AES
	ecological ambience	ECO
	improve exist. house design	PRAC
	no privacy	PRIV
	social class	SC
	social consciousness	SC
	social consciousness	SC
	social consciousness	SC
	social consciousness	SC
	tranquility	TRAN
2.	aesthetics	AES
	security	SEC
	aesthetics	AES
	tranquility	TRAN
	tranquility	TRAN
3.	practical design	PRAC
	practical design	PRAC
	practical design	PRAC
	practical design	PRAC
	practical design	PRAC
	no privacy	PRIV
4.	practical design	PRAC
	practical design	PRAC
	practical design	PRAC
	security	SEC
	craftsmanship	CRAFT
	practical design	PRAC
	security	SEC

TABLE HEM - 1 CONTINUED

Hse.#	Response/Analysis	Code
5.	aesthetics	AES
	practical	FRAC
	practical	FRAC
	aesthetics	AES
	no privacy	PRIV
	aesthetics	AES
	craftsmanship	CRAFT
6.	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	practical	FRAC
	practical	PRAC
	privacy	PRIV
7.	practical	FRAC
	practical	PRAC
	practical	FRAC
	practical	PRAC
	practical	FRAC
	social consciousness	SC
	social consciousness	SC
8.	practical	PRAC
	practical	PRAC
	practical	PRAC
	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	outdoor amenity	OUT
9.	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	security	SEC

TABLE HEM - 1 CONTINUED

Hse.#	Response/Analysis	Code
10.	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	community pride	COM
11.	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	rational design	DES
12.	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
13.	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
14.	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	construction finish	ConQual
	construction finish	ConQual

TABLE HEM - 1 CONTINUED

Hse.#	Response/Analysis	Code
15.	personal preference	FERS
	practical	FRAC
	practical	FRAC
	practical	FRAC
16.	design cons	DESCON
	aesthetics	AES
	aesthetics	AES
	practical	FRAC
17.	econ unattainable	CLASS
	econ unattainable	CLASS
	econ unattainable	CLASS
	econ unattainable	CLASS
18.	aesthetics	AES
	aesthetics	AES
	practical	FRAC
	outdoor tranquility	OUT
	construction quality	CONQUAL
19.	aesthetics	AES
	aesthetics	AES
	econ constr/soc class	CLASS
	econ constr/soc class	CLASS
	econ constr/soc class	CLASS
	practical	FRAC
	construction quality	CONQUAL
	design	DES
	design consideration	DES
20.	siting - tranquility	ECOL
	design consideration	DES
	open space design	OUT
	practical	PRAC
	practical	PRAC
	ecological amenity	ECOL
	ecological amenity	ECOL
	aesthetics	AES

TABLE HEM - 1 CONTINUED

Hse.#	Response/Analysis	Code
21.	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC
	ecological amenity	ECOL
	traditional design	TRAD DES
	traditional design	TRAD DES
22.	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	aesthetics	AES
	aesthetics	AES
	social consciousness	SOC CON
	security	SEC
traditional aesthetics	TRAD AES	
23.	construction quality	CON QUAL
	construction quality	CON QUAL
	privacy	PRIV
	practical	PRAC
	design preference	DES PREF
24.	aesthetics	AES
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	security	SEC
	security	SEC
	ecologic amenity	ECO AMEN
ecologic amenity	ECO AMEN	
design improvement	DES IMP	
25.	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	practical	PRAC
	practical	PRAC

TABLE HEM - 1 CONTINUED

Hse.#	Response/Analysis	Code
26.	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	nostalgia	NOST
27.	aesthetics	AES
	practical	PRAC
	practical	PRAC
	construction quality	CON QUAL
	maintenance	PRAC
	security	SEC
	social consciousness	SOC CON
maintenance	PRAC	
28.	practical	PRAC
	practical	PRAC
	social consciousness	SOC CON
	security	SEC
	design consideration	DES CON
29.	practical	PRAC
	practical	PRAC
	security	SEC
	construction quality	CON QUAL
	architectural tradition	TRAD AES
	inappropriate design	DES PREF
30.	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC
	practical	PRAC

TABLE HEM - 2

HEURISTIC ELICITATION METHODOLOGY

RESPONDENT DESIGN PREFERENCES

MEXICO CITY: SANTO DOMINGO

Hse.#	Response/Analysis	Code
1.	wants to build upstairs	PRAC
	beautiful	AES
	didn't like roof type	AES
	romantic character	HIST AES
	dislikes apartments	PRIVACY
	likes restful spaces	TRAN
	sense of security	SEC
	sense of history	HIST
	animals separate in house	PRAC
	open grate insecure	SEC
2.	unaffordable	CLASS
	dislikes dark spaces	SEC
	looks like hospital	AES
	beautiful	AES
	good lighting	PRAC
3.	pretty roof	AES
	aesthetic arches	AES
	harmonious building	AES
	ugly	AES
	too regular a building	AES
	like space for use	PRAC
	nice view potential	ENV
	liked trees	ENV
	dislikes unfinished const	GD IMP
	likes Mexican balconies	HIST AES
	likes sloped roofs	SELF
	"	AES
	dislikes overhead wires	AES
Mexican scene	HIST AES	

TABLE HEM - 2 CONTINUED

Hse.#	Response/Analysis	Code
4.	likes facade	SEC
	closable windows	SEC
	likes lots of air and light	PRAC
	likes greenerv & bushes	ENV
	likes strong house	SEC
	entry too narrow for big fam	PRAC
5.	likes arches	AES
	likes sloped roof and material	AES
	like a condominium	PRIV
	form too square: monotonous	AES
	beautiful	AES
	incomplete	CON QUAL
	elegant	AES
	aesthetic	AES
	likes wood and slope of roof	HIS AES
likes facade and bricks in wal	AES	
6.	liked colonial desion	HIS AES
	liked decorative windows	AES
	security of bars at window	SEC
	not maintained	PRAC
	street old and poor condition	PRAC
	looks like a factory	AES
	water tanks too reolimented	AES
	likes plants	ENV
	likes stair for looks	AES
dislikes crude wall	SELF	
7.	likes space of entrance	PRAC
	likes plants	ENV
	good stair	PRAC
	insecure space	SEC
	anyone can look in	PRIV
	windows too high	PRAC
	secure windows	SEC
	windows let in lots of sun	PRAC
	too close to road/ noisv	PRAC
security	SEC	

TABLE HEM - 2 CONTINUED

Hse.#	Response/Analysis	Code
8.	stair and landing good space	PRAC
	terrace good for views	ENV
	windows too small	PRAC
	very rustic	HIS AES
	liked plantings	ENV
	too dominating a place	CLASS
	liked colonial design	HIS AES
	likes large windows.wood.balc	AES
	doesn't like mod arch	AES
9.	colonial facade: environ appropri	ENV & AES
	windows and balconies	SEC & AES
	doesn't look like a house	AES
	colonial entrance	HIS AES
	walls not as beautiful as his	AES
	plants	ENV AMB
	unfinished: not beautiful	AES
10.	antique windows	HIS AES
	too close to street	PRAC
	monotonous	BORING
	too small/tight	PRAC
	more space needed in front	PRAC
	traditional facade	HIS AES
	doesn't have "nice" form	AES
	too small for family	PRAC
11.	nice view	PRAC & AES
	likes plants	ECO AES
	messy floor: concrete better	PRAC
	traditional in small towns	HIS AES
	tranquil	TRAN
	indifferent aesthetics	AES
	security	SEC
	handsome historic type	HIS AES
well made	CON QUAL	
12.	pretty roof form	AES
	too dark: possibility of attack	SEC
	hedoe useful	ECO AES

TABLE HEM - 2 CONTINUED

Hse.#	Response/Analysis	Code
13.	good place for kids to play	PRAC
	windows and balconies: handsome	AES
	noise. kid control. bother	PRAC
	likes plants	ENV
	stair looks good and seems stu	CON QUAL & AES
14.	windows bring in lots of light	PRAC
	shade and coolness from plants	ENV
	tile roof entry: nice style	HIS AES
	well built	CON QUAL
	no trees: no shade/fresh air	ENV
15.	2 floors: space to relax	DES CON
	level entry: play space	PRAC & DES CON
	space for a car	ECON
	windows bring in lots of light	PRAC
	closeness to street	PRAC
16.	pretty facade	AES
	like living on street	PRAC
	like colonial arch	HIS AES
	colonial aspect	HIS AES
	elegant doors	EXP MAT
	lack of child control	PRAC
	garden entry	ECO AMN
	lack of security	SEC
17.	decorative style	AES
	likes arches: different	AES
	not enough garden space	ECO AMN
	likes windows	SEC
	windows for serenading	TRAD
	poor planning	PRAC DES
	handrail door	SAFE

TABLE HEM - 2 CONTINUED

Hse.#	Response/Analysis	Code
18.	colonial/elegant	HIS AES
	no space for parents	PRAC
	apts:uqly	AES
	has enough space	PRAC
	likes the plants	ECO AMN
	likes balconies:light and sun	PRAC
	likes steel bars	SAFE
	"	SEC
	likes Veracruzana-like balc.	HIS AES
19.	colonial=dark bldo.	PRAC
	makes good presentation	SELF
	secure gate	SEC
	plants:things of the heart	ECO AMN
	pretty house	AES
20.	makes a good presentation	SELF
	costeño style	HIS AES
	fresh air/palms	ECO
	attractive stairs	AES
	space by stair for store	ECON
	attractive street facade	AES
	balconies at windows	HIS AES
	too much noise	PRAC
	plants covering fence	ECO AMB
	likes facade	AES
21.	too intensive drainline use	PRAC
	against apt.independence	SELF
	outmoded design	PRAC
	nice design from small town	AES
	poorly sited house	DES CON
	stairs too small	SAF
	roof expensive	ECON
	windows and balcs nice	AES
22.	struggles	ECON
	good for children	PRAC
	design of the portón	AES
	likes big places for space	PRAC
	apts too small	PRAC
	they like sidewalks	PRAC

TABLE HEM - 2 CONTINUED

Hse.#	Response/Analysis	Code
23.	wasted space	FRAC
	lack of security	SEC
	lack of security at windows	SEC
	stairs dangerous	SAF
24.	roof gave cool environment	FRAC
	modern arch too cramped	FRAC
	like plants	ENV
	facade makes od presentation	AES
	likes palm tree	ENV
25.	roof water tanks dangerous	FRAC
	slim columns imply poor constr	CON QUAL
	brick:natural:rustic tradition	HIS AES
	colonial:handmade:tradition	HIS AES
	well built	CON QUAL
	doesn't like the facade	AES
original rustic design	HIS AES	
26.	colonial:nice:rustic	HIS AES
	higher class house	CLASS
	nice design	AES
	don't have money	CLASS
	rustic:colonial	HIS AES
27.	traditional constr.= qual.	CON QUAL
	not tranquil	TRAN
	space for tranquility	TRAN
	space offers individuality	SELF
	colonial=less cost	ECON
28.	balconies: get wind from st.	FRAC
	colonial arches:ood	HIS AES
	too small space	FRAC
	flowers likable	ECO AMN
29.	inconclusive results	-

TABLE HEM - 3

HEURISTIC ELICITATION METHODOLOGY

RESPONDENT DESIGN PREFERENCES

TLALNEFANTLA: UDEVHOR

Hse.#	Response/Analysis	Code
1.	protective gate for kids	SAFE
	Portón:big:visitors	PRAC
	too dangerous by street	SEC
	garden:flowers:pleasant	ECO
2.	no space for kids	PRAC
	no space for auto park'g	PRAC
	directly on street good	TRAN
	independent house good	SELF
	independent:tranquil	TRAN
	not enough space for kids	PRAC
	enough space	PRAC
	like the green garden	ECO AMN
need for security	SEC	
3.	likes it:pretty	AES
	has lots of space	PRAC
	roof over portón:protects	PRAC
	protection needed	SEC
	likes patio/trees	ECO AMN
4.	campesino form:tradition	HIS AES
	too much noise	PRAC
	likes finca-like entry	TRAD AES
	garden:fresh air	ECO AMN
	good view from stair	VISTA
5.	likes space	PRAC
	very pretty	AES
	likes facade	AES
	inconclusive	-

TABLE HEM - 3 CONTINUED

Hse.#	Response/Analysis	Code
6.	stairs dangerous	SAFE
	inconclusive	-
	lots of space for kids	PRAC
	problems with neigh	SELF
	problems with kid contr	PRAC
	not enough space	PRAC
7.	pretty porton:decoration	AES
	typical design	HIS AES
	large building --	incl
	unfinished not good	CON QUAL
8.	beautiful provincial roof	TRAD AES
	poorly built	CON QUAL
	too expensive	ECON
	beautiful:colonial	TRAD AES
	lack of auto space	PRAC
	abnormal looks for house	PERCEP
9.	nice roof material	CON QUAL
	apts.:noise problem	PRAC
	lots of space for fam	PRAC
	balconies for views	VISTA
	garden: shade/fresh air	ECO AMN
10.	likes garden next to hse	ECO AMN
	windows by street:see act	VISTA
	need security	SEC
	wants independent hsq	PREF
11.	plenty space for fam.	PRAC
	good walls/interest'g con	CON QUAL
	more space:live better	PRAC
	facade:good presentation	AES
	likes palm tree: oxvaen	ECO AMN
	beyond family income	ECON
	likes facade	AES
	likes garden	ECO AMN

TABLE HEM - 3 CONTINUED

Hse.#	Response/Analysis	Code
12.	natural landscape	ECO AMN
	boring facade: nothing	AES
	traditional looks	TRAD AES
	sad and lonely space	incl

13.	facade for others	
	we struggle	
	held back by system	CLASS
	too much noise & traffic	PRAC
	apts. too small	PRAC
	not a house:no garden	SELF

14.	pretty entrance	AES
	likes the garden	ECO AMN
	tranquil	TRAN
	likes appearance	AES
	likes it all	incl.

15.	likes efficiency of const	CON QUAL
	likes big patio	ECO AMN
	likes entry/wide steps/tr	TRAN
	able to sit at windows	DES CON
	3 stys: lot of space	PRAC
	live on str:see action	VISTA

16.	well designed stair	DES CON
	nice vista: clean wall	VISTA
	secure for autos	SEC
	good views	VISTA
	lost of space	PRAC

17.	unfinished	CON QUAL
	pretty door	AES
	very secure	SEC
	panoramic view from balc	VISTA

TABLE HEM - 3 CONTINUED

Hse.#	Response/Analysis	Code
18.	he likes the form	AES and CON QUAL
	all is beautiful	AES
	problems with renters	PREF
	beautiful facade	AES
19.	likes traditonal design	TRAD AES
	no privacy in apt.	PRIV
	doesn't like apts.	PREF
	better looking: tradition	TRAD
20.	lots of things beyond the	ECON
	likes palm tree	ECO AMN
	too tight	FRAC
	no beauty	AES
	provincial design	TRAD AES
	home of owners	CLASS
	unaffordable	ECON
21.	likes porton:colonial	TRAD AES
	only for the rich	ECON
	good type of constr	CON QUAL
	well built walls	CON QUAL
22.	apts too tight	FRAC
	not good for kids:street	FRAC
	typical design	TRAD AES
	provincial design: tranqu	TRAN
	nice trees/garden	ECO AMN
	typical provincial entry	TRAD AES
23.	very large space	incl.
	garden with shade	ECO AMN
	tranquil place to be yrse	TRAN
	no people:sad:paint it happy! --incl.--	
24.	likes old/antique roof	TRAD AES
	likes water supply	FRAC
	too expensive	ECON
	nice. but too expensive	ECON

TABLE HEM - 3 CONTINUED

Hse.#	Response/Analysis	Code
25.	street dangerous	SAFE
	likes simple house	PRAC
	3 stvs. separation:tran	TRAN
	plants: pollution/oxygen	ECO AMN
	too much security	AES
	noise problems with kids	PRAC
	entry:provincial	TRAD AES
	entry: tranquil	TRAN
	simple facade serves	DES CON and ECON
	likes rustic material	TRAD AES
	pretty stair	AES
	pretty but not his	CLASS
	pretty but beyond her	ECON
	pretty but wasteful	ECON
	pretty:tranquil	TRAN

26.	likes plants: looks good	ECO AMN
	dislikes unfinished const	CON QUAL
	likes puebla design	TRAD AES
	palm tree: oxygen for kid	ECO AMN

27.	traditional design	TRAD AES
	likes facade	AES
	noise in apts.!	PRAC
	likes plants	ECO AMN

28.	entry: wide for kids	PRAC
	dangerous stairs	SAFE
	porton separates street	PRAC
	wide house	PRAC
	safe place for kid play	SAFE

TABLE HEM - 4

HEURISTIC ELICITATION METHODOLOGY

RESPONDENT DESIGN PREFERENCES

TLALNEPANTLA: REFORMA URBANA

Hse.#	Response/Analysis	Code
1.	a national architecture	AES
	wrong style for highlands	AES
	lacks privacy	PRAC
	no play space	PRAC
	likable design	AES
2.	security	SEC
	privacy	PRAC
	financial security	ECON
	construction quality	CON QUAL
	aesthetics	AES
	environment	ENV
	practical design consid.	PRAC
	construction quality	CON QUAL
	kid play space	PRAC
	shade/breeze	ENV
luxury aesthetics	CLASS AES	
3.	outdoor aesthetic	ENV
	fresh air environment	ENV
	shade/cool environment	ENV
	fresh air/sun environment	ENV
4.	dangerous stair design	PRAC
	colonial architecture	AES
	security	SEC
	historic aesthetic	AES
5.	historical design	AES
	importance of quality site	PRAC
	personal security	SEC
	outdoor environment	ENV
	child safety	PRAC
	view for vista	ENV
	fresh air	ENV
	security against thieves	SEC
	safety for children	PRAC

TABLE HEM - 4 CONTINUED

Hse.#	Response/Analysis	Code
6.	identifies it with class	CLASS
	aesthetics	AES
	environmental control	ENV
	view/design consid	ENV
	environmental aesthetics	ENV
	quality construction	CON QUAL
7.	likes plants: joy	ENV
	rustic/not finished	CON QUAL
	nice style/ranchero	AES
	pretty entry gate	AES
8.	aesthetics	AES
	practical design	PRAC
	aesthetic colonial	AES
	likes style	AES
	security/protection	SEC
	secure design	CON QUAL
9.	noise problems	PRAC
	likes flowers	ENV
	not his class	CLASS
10.	aesthetics	AES
	too big/will fall	PRAC
	aesthetics	AES
	access for services	PRAC
11.	windows placed for view	PRAC
	flowers/fresh air/cool	ENV
	pretty plants	ENV
	protection from danger	SEC
	aesthetics	AES
	place to rest	ENV
	roof keeps house cool	PRAC
12.	historic type	AES
	quality living	ENV
	environmental quality	ENV
	practical design considerat	PRAC

TABLE HEM - 4 CONTINUED

Hse.#	Response/Analysis	Code
13.	likes luxury	LUXURY
	environmental aesthetics	ENV AES
	practical design considerations	PRAC
	environmental aesthetics	ENV AES
	environmental aesthetics	ENV AES
	aesthetics	AES
14.	large setting	no code
	environmental aesthetics	ENV AES
	aesthetics	AES
	personal comfort	PRAC
	environmental aesthetics	ENV AES
15.	practical design	PRAC
	design security/safety	SEC / PRAC
	luxury	LUXURY
	doesn't like apts.	DES PREF
16.	aesthetics	AES
	aesthetics	AES
	aesthetics	AES
	security against outsiders	SEC
17.	large country house	HIS AES
	historic aesthetics	HIS AES
	aesthetics	AES
	environmental aesthetics	ENV AES
18.	too dense	DES PREF
	place for kids	PRAC
	environmental quality	ENV QUAL
	aesthetics	AES
	tranquil	TRAN
19.	environmental aesthetics	ENV AES
	quality construction	CON QUAL
	environmental quality	CON QUAL
	practical design consid	PRAC
	security	SEC

TABLE HEM - 4 CONTINUED

Hse.#	Response/Analysis	Code
20.	quality construction	CON QUAL
	quality construction	CON QUAL
	environmental aesthetics	ENV AES
	house must be finished	CON QUAL
21.	unfinished construction	CON QUAL
	historic aesthetics	HIS AES
	make a good presentation	VANITY
	secure for kids to play	PRAC
	vanity	VANITY
22.	historic aesthetics	HIS AES
	environmental quality	ENV
23.	environmental quality	ENV
	security	SEC
	sociability	SOC
	environmental quality	ENV
	environmental quality	ENV
	environmental aesthetics	ENV AES
24.	aesthetics	AES
	environmental quality	ENV
	space need	PRAC
	practical design consideration	PRAC
	environmental quality	ENV
	environmental quality	ENV
25.	environmental quality	ENV
	self expression	SELF
	construction unfinished	CON QUAL
	space must be sufficient	PRAC
26.	security	SEC
	construction unfinished	CON QUAL
27.	luxury	LUX
	luxury	LUX
	luxury	LUX
	happiness	SELF
	luxury	LUX

TABLE HEM - 4 CONTINUED

Hse.#	Response/Analysis	Code
28.	ecologic ambience	ENV
	aesthetics	AES
	luxury	LUX
	construction unfinished	CON QUAL
	ecological amenity	ENV
29.	class distinction	CLASS
	safety design	PRAC
	ecologic ambience	ENV
	lack of privacy	PRAC
30.	quality construction	CON QUAL
	inadequate design	PRAC
	bad design	PRAC
	has exchange value	ECON
31.	ecologic ambience	ENV
	class distinction	CLASS
	privacy	PRAC
	ecologic ambience	ENV
	homeland nostalgia	SELF

TABLE HEM - 5

LISTING OF ALL PRELIMINARY ELICITATION CATEGORIES

ORGANIZED BY SETTLEMENT TYPE

36 PRELIMINARY ELICITATION CATEGORIES	MEXICO CITY Settlement:		TLALNEPANTLA Settlement:	
	PALO ALTO	SANTO DOMINGO	UDEVHORREFORMA	URBANA
1 AES	42	53	17	24
2 BORING		1		
3 CLASS	7	4	3	4
4 COM PRD	1			
5 CON QUAL	8	8	10	15
6 CRAFT	2			
7 DESIGN	4			
8 DES CON	2	3	3	
9 DES IMP	1			
10 DES PREF	2			2
11 ECO	5	1	1	
12 ECON		5	10	2
13 ECON AMEN	2	8	17	
14 ENV AES				10
15 ENV AMB		1		
16 ENV	2	13		30
17 ENV QUAL				1
18 EXP MATL		1		
19 HIS AES		25	2	6
20 HIST		1		
21 LUX				8
22 NOST	1			
23 OUT TRAN	1			
24 PERCEP			1	
25 PERS	1		3	
26 PRAC	79	46	30	29
27 PRIV	5	3	1	
28 SAFE		4	5	
29 SEC	10	19	6	11
30 SELF		6	3	3
31 SOC				1
32 SOC CON	10			
33 TRAD AES	4	1	15	
34 TRAN	3	4	9	1
35 VANITY				2
36 VISTA		1	8	
Total:	693	208	144	149

TABLE HEM - 6

LISTING OF ELICITATION - MEXICO CITY

ORGANIZED BY SETTLEMENT TYPE AND GROUPED ELICITATIONS

Elicitation Group	Palo Alto		Santo Domingo	
	n	(%)	n	(%)
1. Aesthetics				
AESTHETICS (1)	42		53	
HISTORIC AESTH. (19)			25	
TRADITIONAL AES (33)	4		1	
DESIGN (7)	4			
DESIGN PREFER. (10)	2			
HISTORY (20)			1	
GROUP TOTALS	52	27.08	80	38.46
2. Personal				
SELF (30)			6	
LUXURY MATLS (21)				
EXPENSIVE MATLS (18)			1	
BORING (2)			1	
NOSTALGIA (22)	1			
PERCEPTION (24)				
PERSONAL (25)	1			
PRIVACY (27)	5		3	
VANITY (35)				
GROUP TOTALS	7	3.65	11	5.29
3. Class/Econ/Social Issues				
CLASS (30)	7		4	
ECONOMIC ISSUES (12)			5	
COMMUNITY PRIDE (4)	1			
SOCIAL ISSUES (31)				
SOCIAL CONSC. (32)	10			
GROUP TOTALS	18	9.38	9	4.33

TABLE HEM - 6 CONTINUED

Elicitation Group	Palo Alto		Santo Domingo	
	n	(%)	n	(%)
4. Construction Issues				
CONSTRUCT. QUAL. (5)	8		8	
CRAFT (6)	2			
GROUP TOTALS	10	5.21	8	3.85
5. Practical Design Issues				
FRAC. DESIGN (26)	79		46	
DESIGN CONSID. (8)	2		3	
DESIGN IMPROVE. (9)	1			
GROUP TOTALS	82	42.71	49	23.56
6. Environmental/Ecolooov Issues				
ECOLOGY (11)	5		1	
ENVIRON. ISSUES (16)	2		13	
ENVIRON. AESTH. (14)				
ENVIRON. QUALITY (17)				
OUTDOOR TRANQ. (23)	1			
ENVIRON. AMBIEN. (15)			1	
TRANQUILITY (34)	3		4	
VISTA (36)			1	
ECOLOG. AMENITY (13)	2		8	
GROUP TOTALS	13	6.77	28	13.46
7. Security				
SAFE (28)			4	
SECURITY (29)	10		19	
GROUP TOTALS	10	5.21	23	11.06
TOTAL ELICITATIONS	192	100.00	208	100.00

TABLE HEM - 7

LISTING OF ELICITATION - TLALNEPANTLA

ORGANIZED BY SETTLEMENT TYPE AND GROUPED ELICITATIONS

Elicitation Group	UDEVHOR		Reforma Urbana	
	n	(%)	n	(%)
1. Aesthetics				
AESTHETICS (1)	17		24	
HISTORIC AESTHETICS	2		6	
TRADITIONAL AES (33)	15			
DESIGN (7)				
DESIGN PREFER. (10)			2	
HISTORY (20)				
GROUP TOTALS	34	23.61	32	21.48
2. Personal				
SELF (30)	3		3	
LUXURY MATLS (21)			8	
EXPENSIVE MATLS (18)				
BORING (2)				
NOSTALGIA (22)				
PERCEPTION (24)	1			
PERSONAL (25)	3			
PRIVACY (27)	1			
VANITY (35)			2	
GROUP TOTALS	8	5.56	13	8.72
3. Class/Econ/Social Issues				
CLASS (30)	3		4	
ECONOMIC ISSUES (12)	10		2	
COMMUNITY PRIDE (4)				
SOCIAL ISSUES (31)			1	
SOCIAL CONSC. (32)				
GROUP TOTALS	13	9.03	7	4.70

TABLE HEM - 7 CONTINUED

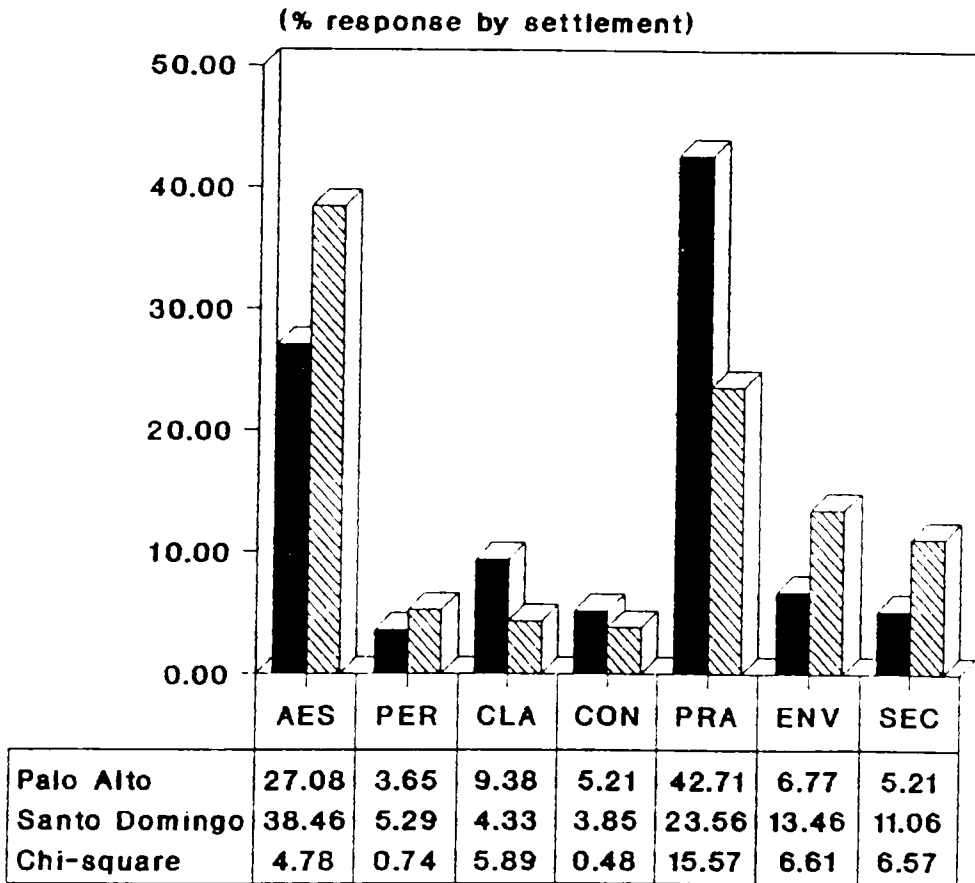
Elicitation Group		UDEVHOR		Reforma Urbana	
	n	(%)	n	(%)	
4. Construction Issues					
CONSTRUCT. QUAL. (5)	10		15		
CRAFT (6)					
GROUP TOTALS	10	6.94	15	10.07	
5. Practical Design Issues					
PRAC. DESIGN (26)	30		29		
DESIGN CONSID. (8)	3				
DESIGN IMPROVE. (9)					
GROUP TOTALS	33	22.92	29	19.46	
5. Environmental/Ecology Issues					
ECOLOGY (11)	1				
ENVIRON. ISSUES (16)			30		
ENVIRON. AESTH. (14)			10		
ENVIRON. QUALITY (17)			1		
OUTDOOR TRANQ. (23)					
ENVIRON. AMBIEN. (15)					
TRANQUILITY (34)	9		1		
VISTA (36)	8				
ECOLOG. AMENITY (13)	17				
GROUP TOTALS	35	24.31	42	28.19	
6. Security					
SAFE (28)	5				
SECURITY (29)	6		11		
GROUP TOTALS	11	7.64	11	7.38	
TOTAL ELICITATIONS	144	100.00	149	100.00	

CHART HEM - 8

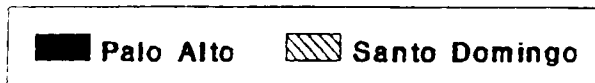
MEXICO CITY

Heuristic Elicitations

By Categories



Design Preference Categories



Chi-square significant at 3.84

Palo Alto - Community-based
 Santo Domingo - Individualistic

Settlements:

TABLE HEM - 9

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Mexico City
 Response Category: Aesthetics
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	27.08	27.08	0	0	0
IND	38.46	27.08	11.38	129.5044	4.782289
Totals	65.54	54.16	11.38	129.5044	4.782289 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$$\chi^2 = 3.84$$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Reject

=====

TABLE HEM - 10

TEST FOR CHI-SQUARE, NOMINAL DATA

=====
 City: Mexico City
 Response Category: Personal
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	3.65	3.65	0	0	0
IND	5.29	3.65	1.64	2.6896	0.736876
Totals	8.94	7.3	1.64	2.6896	0.736876 =χ ²

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

χ² = 3.84

Reject null hypothesis if CV < χ²

Fail to reject if CV > χ².

Fail to reject

=====

TABLE HEM - 11

TEST FOR CHI-SQUARE. NOMINAL DATA

City: Mexico City

Response Category: Class / Econ / Social Issues

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	9.38	4.33	5.05	25.5025	5.889722
IND	4.33	4.33	0	0	0
Totals	13.71	8.66	5.05	25.5025	5.889722 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

 $\chi^2 = 3.84$ Reject null hypothesis if $CV < \chi^2$ Fail to reject if $CV > \chi^2$.

Reject

TABLE HEM - 12

TEST FOR CHI-SQUARE. NOMINAL DATA

=====
 City: Mexico City
 Response Category: Construction
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-R	5.21	3.85	1.36	1.8496	0.480415
IND	3.85	3.85	0	0	0
Totals	9.06	7.7	1.36	1.8496	0.480415 =χ ²

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$$\chi^2 = 3.84$$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Fail to reject

=====

TABLE HEM - 13

TEST FOR CHI-SQUARE. NOMINAL DATA

=====
 City: Mexico City

Response Category: Practical
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.

Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	42.71	23.56	19.15	366.7225	15.56547
IND	23.56	23.56	0	0	0
Totals	66.27	47.12	19.15	366.7225	15.56547 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$\chi^2 = 3.84$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Reject
 =====

TABLE HEM - 14

TEST FOR CHI-SQUARE. NOMINAL DATA. ONE-SAMPLE CASE

City: Mexico City

Response Category: Environmental

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.

Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	6.77	6.77	0	0	0
IND	13.46	6.77	6.69	44.7561	6.610945
Totals	20.23	13.54	6.69	44.7561	6.610945 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

 $\chi^2 = 3.84$ Reject null hypothesis if $CV < \chi^2$ Fail to reject if $CV > \chi^2$.

Reject

TABLE HEM - 15

TEST FOR CHI-SQUARE. NOMINAL DATA

=====
 City: Mexico City
 Response Category: Security
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	5.21	5.21	0	0	0
IND	11.06	5.21	5.85	34.2225	6.568618
Totals	16.27	10.42	5.85	34.2225	6.568618 =χ ²

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

χ² = 3.84

Reject null hypothesis if CV < χ²

Fail to reject if CV > χ².

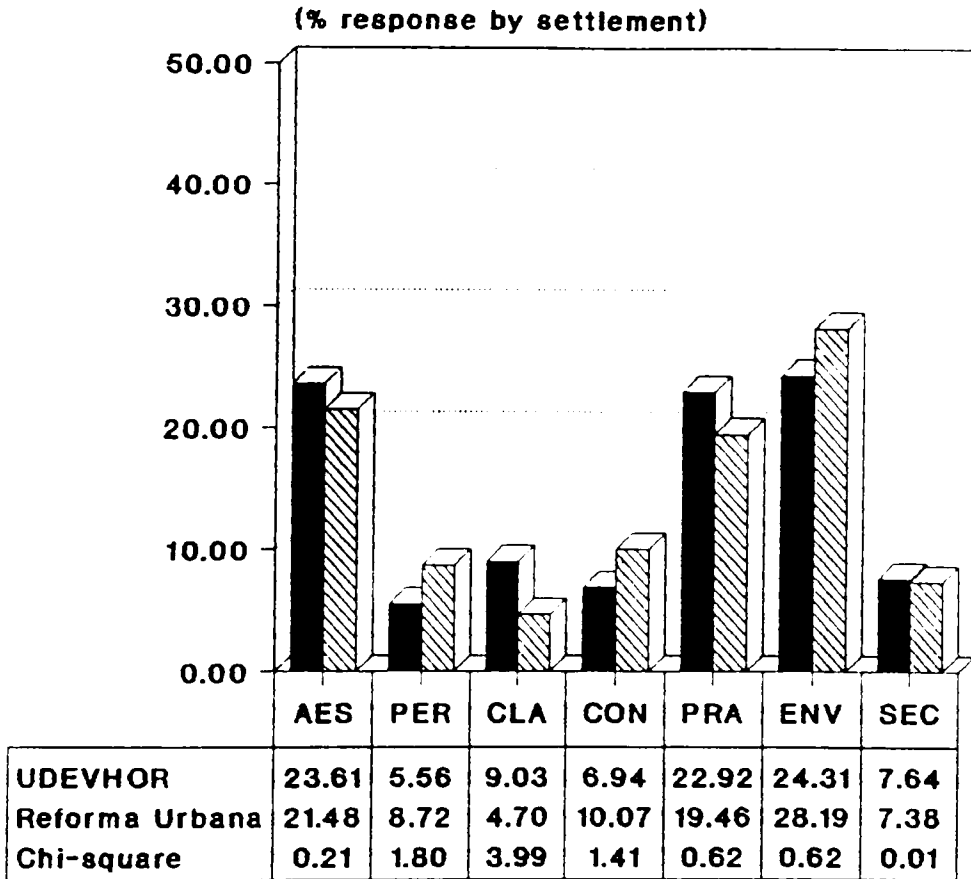
Reject

=====
 (Hinkle, et al. 1979. pgs. 338-339)

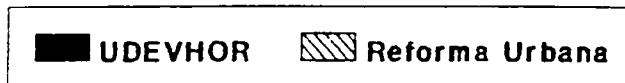
CHART HEM - 16

TLALNEPANTLA

Heuristic Elicitations By Categories



Design Preference Categories



Chi-square significant at 3.84
UDEVHOR - Community-based
Reforma Urbana - Individualistic

Settlements:

TABLE HEM - 17

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalnepantla
 Response Category: Aesthetics
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	23.61	21.48	2.13	4.5369	0.211215
IND	21.48	21.48	0	0	0
Totals	45.09	42.96	2.13	4.5369	0.211215 =χ ²

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

χ² = 3.84

Reject null hypothesis if CV < χ²

Fail to reject if CV > χ².

Fail to reject

=====

TABLE HEM - 18

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalneantla

Response Category: Personal
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.

Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	5.56	5.56	0	0	0
IND	8.72	5.56	3.16	9.9856	1.795971
Totals	14.28	11.12	3.16	9.9856	1.795971 =χ ²

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

χ² = 3.84

Reject null hypothesis if CV < χ²

Fail to reject if CV > χ².

Fail to reject

TABLE HEM - 19

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalnepantla
 Response Category: Class
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

 2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	9.03	4.7	4.33	18.7489	3.989127
IND	4.7	4.7	0	0	0
Totals	13.73	9.4	4.33	18.7489	3.989127 = χ^2

 3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$\chi^2 = 3.84$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Reject

TABLE HEM - 20

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalnepantla
 Response Category: Construction
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

 2. Value of Test Statistic?

Settlmnt Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	6.94	6.94	0	0	0
IND	10.07	6.94	3.13	9.7969	1.411657
Totals	17.01	13.88	3.13	9.7969	1.411657 =χ ²

 3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

χ² = 3.84

Reject null hypothesis if CV < χ²

Fail to reject if CV > χ².

Fail to reject

TABLE HEM - 21

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalneopantla
 Response Category: Practical
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	22.92	19.46	3.46	11.9716	0.615190
IND	19.46	19.46	0	0	0
Totals	42.38	38.92	3.46	11.9716	0.615190 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$\chi^2 = 3.84$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Fail to reject

=====

TABLE HEM - 22

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalnepantla

Response Category: Environmental
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	24.31	24.31	0	0	0
IND	28.19	24.31	3.88	15.0544	0.619267
Totals	52.5	48.62	3.88	15.0544	0.619267 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$\chi^2 = 3.84$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Fail to reject
 =====

TABLE HEM - 23

TEST FOR CHI-SQUARE. NOMINAL DATA.

=====
 City: Tlalnepantla
 Response Category: Security
 =====

1. Hypothesis Test?

Null hypothesis: That the percentage of elicited responses of the two settlement types does not vary.
 Test at significance level of .05.

2. Value of Test Statistic?

Settlement Type	Observed %	Expected %	(O-E)	(O-E) ²	(O-E) ² /E
C-B	7.64	7.38	0.26	0.0676	0.009159
IND	7.38	7.38	0	0	0
Totals	15.02	14.76	0.26	0.0676	0.009159 = χ^2

3. Critical Value of Test Statistic?

degrees of freedom: (2-1) = 1

$\chi^2 = 3.84$

Reject null hypothesis if $CV < \chi^2$

Fail to reject if $CV > \chi^2$.

Fail to reject

=====
 (Hinkle, et al. 1979. pgs. 338-339)

PHOTOGRAPHIC SELECTIONS 1 CB (above) AND 2 CB (below)



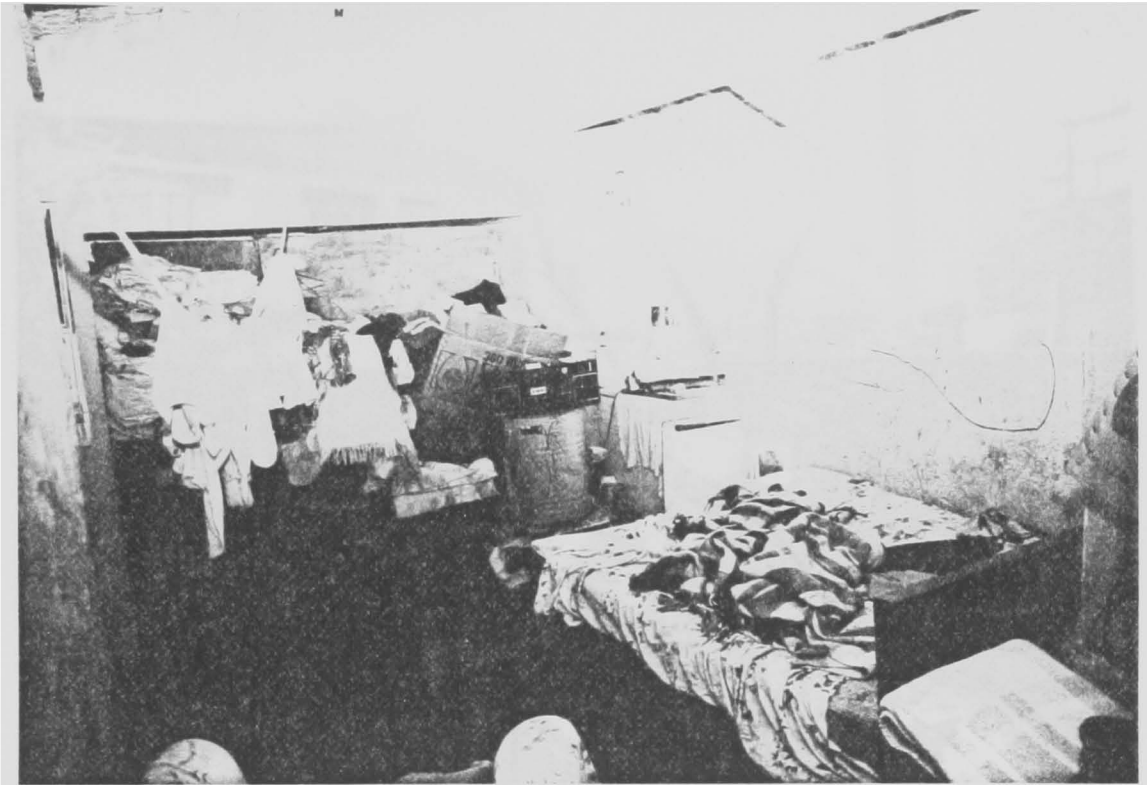
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PHOTOGRAPHIC SELECTIONS 5 CB (above) AND 6 CB (below)



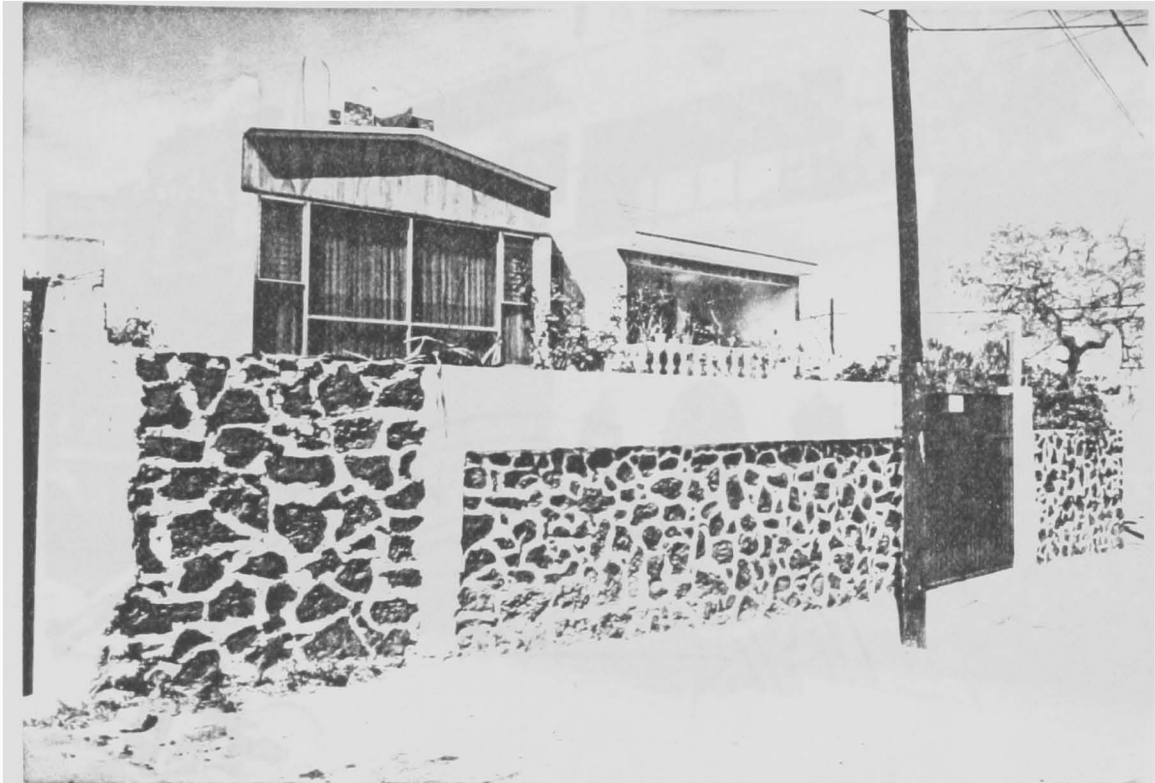
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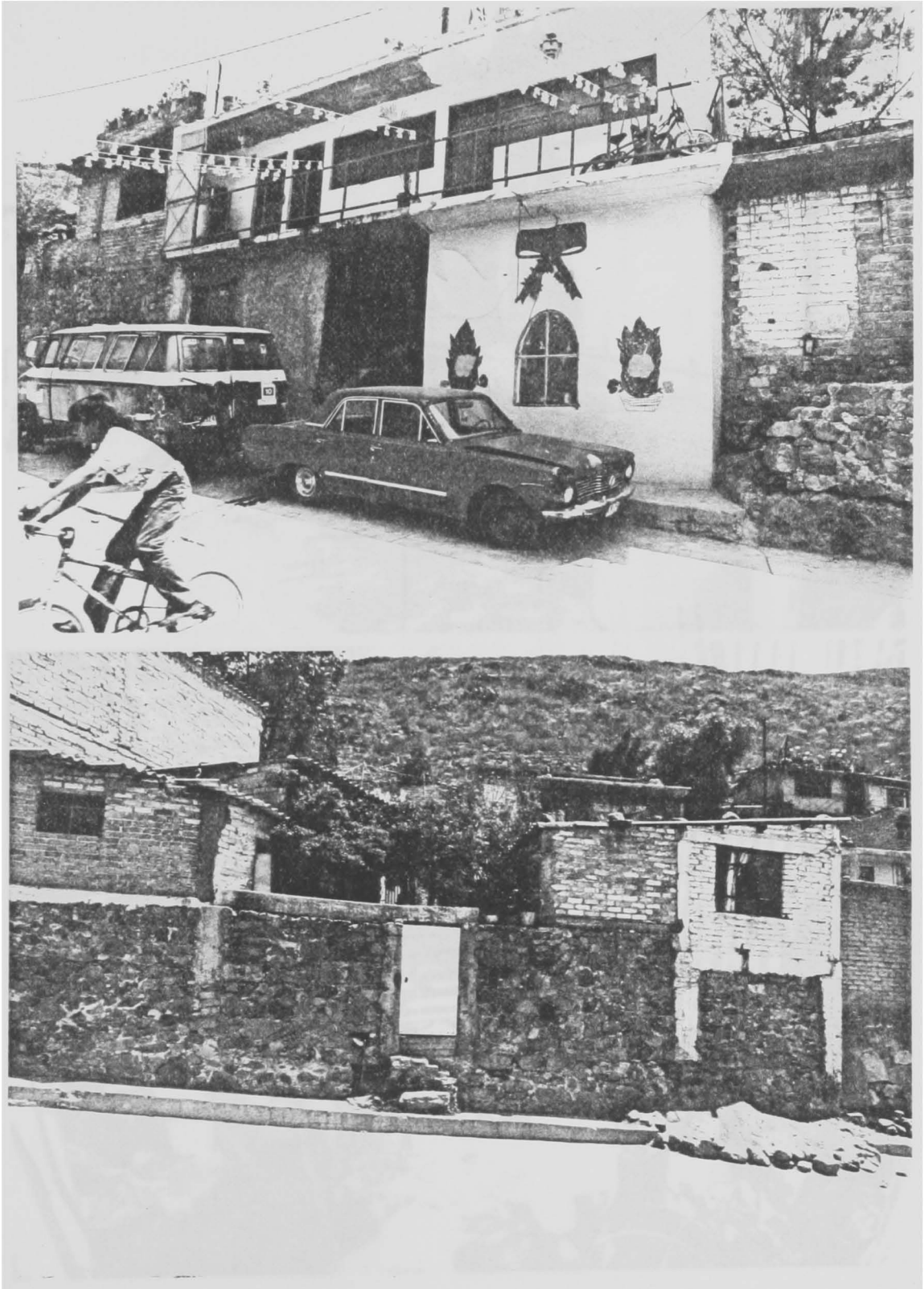
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PHOTOGRAPHIC SELECTIONS 3 IND (above) AND 4 IND (below)



PHOTOGRAPHIC SELECTIONS 5 IND (above) AND 6 IND (below)



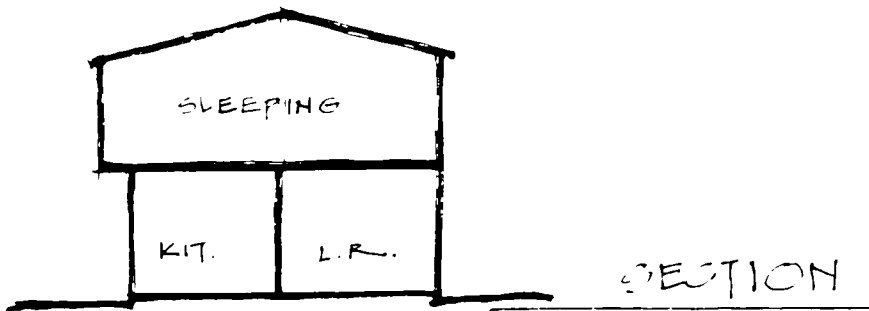
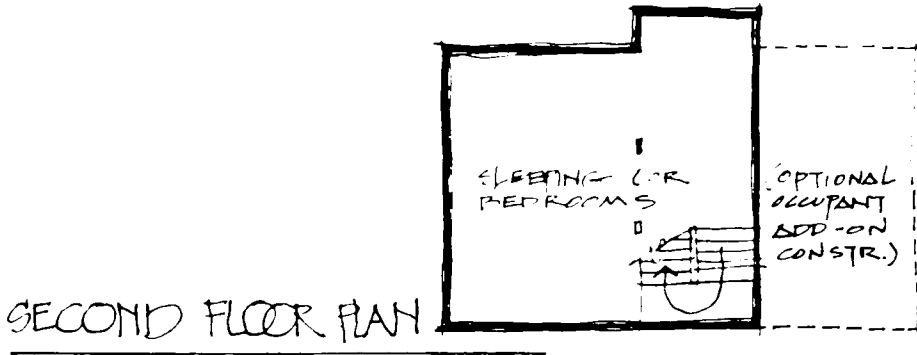
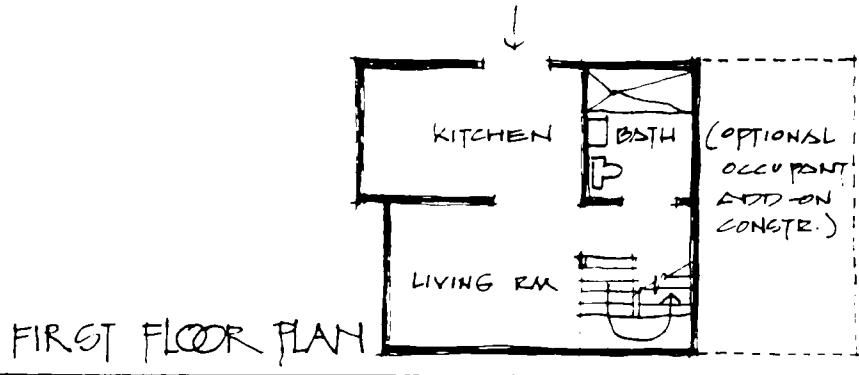
PHOTOGRAPHIC SELECTIONS 7 IND (above) AND 8 IND (below)



PHOTOGRAPHIC SELECTION 9 IND

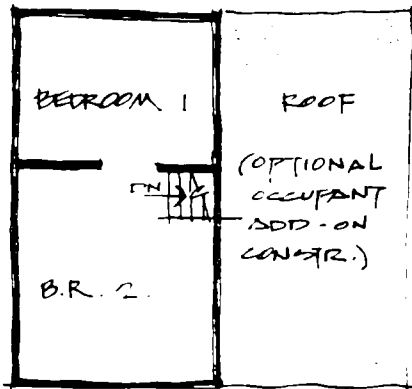


Sketch 1 PA: Plans and Section of Typical Unit at Palo Alto

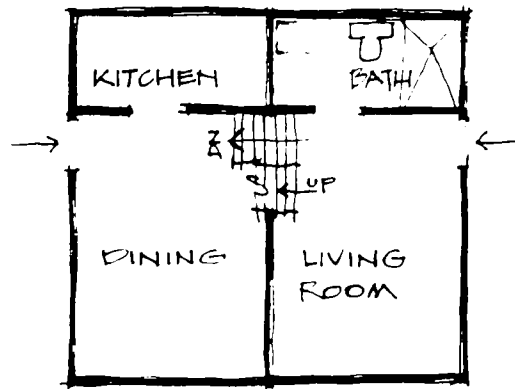


NO SCALE

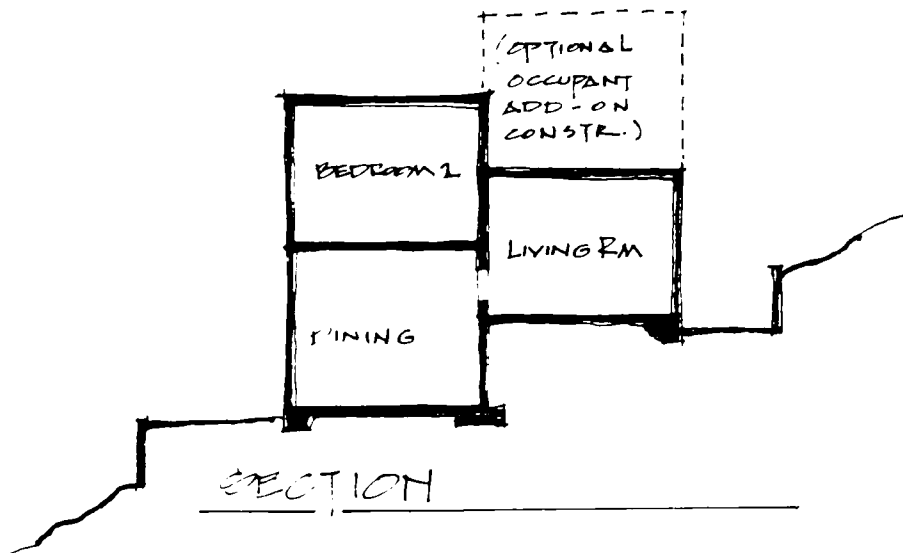
Sketch 1 UDEVHOR: Plans and Section of
Typical Unit at UDEVHOR



SECOND FLOOR PLAN



FIRST FLOOR PLAN



SECTION

NO SCALE

TABLE CON - 1

MEXICO CITY:

HOUSING CONSOLIDATION SURVEY - SUMMARY BY SETTLEMENT TYPE
=====

COMMUNITY-BASED SETTLEMENT

INDIVIDUALISTIC SETTLEMENT

House No.	Level of Consolidation %	House No.	Level of Consolidation %
=====		=====	
PALO ALTO		SANTO DOMINGO	
1	100.00	1	32.22
2	92.65	2	58.04
3	95.24	3	71.53
4	97.26	4	73.33
5	81.49	5	68.62
6	86.42	6	86.79
7	93.91	7	93.70
8	95.00	8	77.24
9	76.70	9	55.00
10	88.86	10	57.30
11	100.00	11	92.17
12	99.32	12	100.00
13	95.81	13	98.89
14	98.36	14	100.00
15	81.31	15	85.58
16	99.85	16	71.15
17	99.86	17	62.56
18	98.06	18	37.71
19	93.23	19	91.67
20	87.64	20	97.24
21	62.31	21	80.78
22	92.32	22	73.04
23	85.09	23	76.52
24	87.02	24	49.13
25	91.14	25	90.48
26	64.09	26	59.27
27	98.88	27	65.85
28	100.00	28	70.97
29	100.00	29	89.52
30	93.24	30	94.87
31	70.88		

(All house numbers used are fictitious numbers to preserve anonymity.)

TABLE CON - 2

TLALNEPANTLA:

HOUSING CONSOLIDATION SURVEY - SUMMARY BY SETTLEMENT TYPE

COMMUNITY-BASED SETTLEMENT

INDIVIDUALISTIC SETTLEMENT

House No.	Level of Consolidation %	House No.	Level of Consolidation %
=====		=====	
UDEVHOR		REFORMA URBANA	
1	94.06	1	15.60
2	62.70	2	72.07
3	93.25	3	55.00
4	90.63	4	36.98
5	89.28	5	70.00
6	87.54	6	36.10
7	90.57	7	76.94
8	89.14	8	75.38
9	90.00	9	86.51
10	96.56	10	59.02
11	95.33	11	84.31
12	96.25	12	27.20
13	90.31	13	68.24
14	93.13	14	68.49
15	94.86	15	52.12
16	97.10	16	55.65
17	96.81	17	51.06
18	83.43	18	69.61
19	89.86	19	74.60
20	82.66	20	92.70
21	93.59	21	47.92
22	90.63	22	56.45
23	85.29	23	37.74
24	64.35	24	72.10
25	88.75	25	71.28
26	96.00	26	87.84
27	97.19	27	76.62
28		28	57.92
29		29	82.68
30		30	67.76
31		31	

(All house numbers used are fictitious numbers to preserve anonymity.)

TABLE CON - 3

HOUSING CONSOLIDATION SURVEY

SUMMARY BY GROUPED INTERVALS

MEXICO CITY

COMMUNITY-BASED SETTLEMENTS

INDIVIDUALISTIC SETTLEMENTS

Interval (%)	House Level of Consolidation %	count
60-69	62.31	1
-----2	64.09	
70-79	70.88	1
-----2	76.70	
80-89	81.31	1
-----2	81.49	
	85.09	3
	86.42	4
	87.02	5
	87.64	6
	88.86	7
90-100	91.14	1
-----2	92.32	
	92.65	3
	93.23	4
	93.24	5
	93.91	6
	95.00	7
	95.24	8
	95.81	9
	97.26	10
	98.06	11
	98.36	12
	98.88	13
	99.32	14
	99.85	15
	99.86	16
	100.00	17
	100.00	18
	100.00	19
	100.00	20

Interval (%)	House Level of Consolidation %	count
30-39	32.22	1
-----2	37.71	
40-49	49.13	1
50-59	55.00	1
-----2	57.30	
	58.04	3
	59.27	4
60-69	62.56	1
-----2	65.85	
	68.62	3
70-79	70.97	1
-----2	71.15	
	71.53	3
	73.04	4
	73.33	5
	76.52	6
	77.24	7
80-89	80.78	1
-----2	85.58	
	86.79	3
	89.52	4
90-100	90.48	1
-----2	91.67	
	92.17	3
	93.70	4
	94.87	5
	97.24	6
	98.89	7
	100.00	8
	100.00	9

TABLE CON - 3 CONTINUED

COMMUNITY-BASED SETTLEMENTS		INDIVIDUALISTIC SETTLEMENTS	
Interval (%)	House Level of Consolidation %	Interval (%)	House Level of Consolidation %
	count		count
=====		=====	
MEXICO CITY		MEXICO CITY	
PALO ALTO		SANTO DOMINGO	
=====		=====	
n	31	n	30
mean	90.51	mean	75.37
minimum	62.31	minimum	32.22
maximum	100.00	maximum	100.00
s	10.25	s	18.11
variance	105.05	variance	327.92

TABLE CON - 4

HOUSING CONSOLIDATION SURVEY

SUMMARY BY GROUPED INTERVALS

TLALNEPANTLA

COMMUNITY-BASED SETTLEMENTS

Interval (%)	House Level of Consolidation	
	count	%
60-69	1	62.70
-----2		64.35
80-89	1	82.66
-----2		83.43
	3	85.29
	4	87.54
	5	88.75
	6	89.14
	7	89.28
90-100	1	89.86
-----2		90.00
	3	90.31
	4	90.57
	5	90.63
	6	90.63
	7	93.13
	8	93.25
	9	93.59
	10	94.06
	11	94.86
	12	95.33
	13	96.00
	14	96.25
	15	96.56
	16	96.81
	17	97.10
	18	97.19

INDIVIDUALISTIC SETTLEMENTS

Interval (%)	House Level of Consolidation	
	count	%
10-19	1	15.60
20-29	1	27.20
30-39	1	36.10
-----2		36.98
	3	37.74
40-49	1	47.92
50-59	1	51.06
-----2		52.12
	3	55.00
	4	55.65
	5	56.45
	6	57.92
	7	59.02
60-69	1	67.76
-----2		68.24
	3	68.49
70-79	1	69.61
-----2		70.00
	3	71.28
	4	72.07
	5	72.10
	6	74.60
	7	75.38
	8	76.62
	9	76.94
80-89	1	82.68
-----2		84.31
	3	86.51
	4	87.84
90-100	1	92.70

TABLE CON - 4 CONTINUED

COMMUNITY-BASED SETTLEMENTS

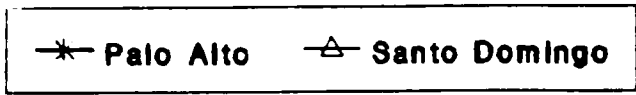
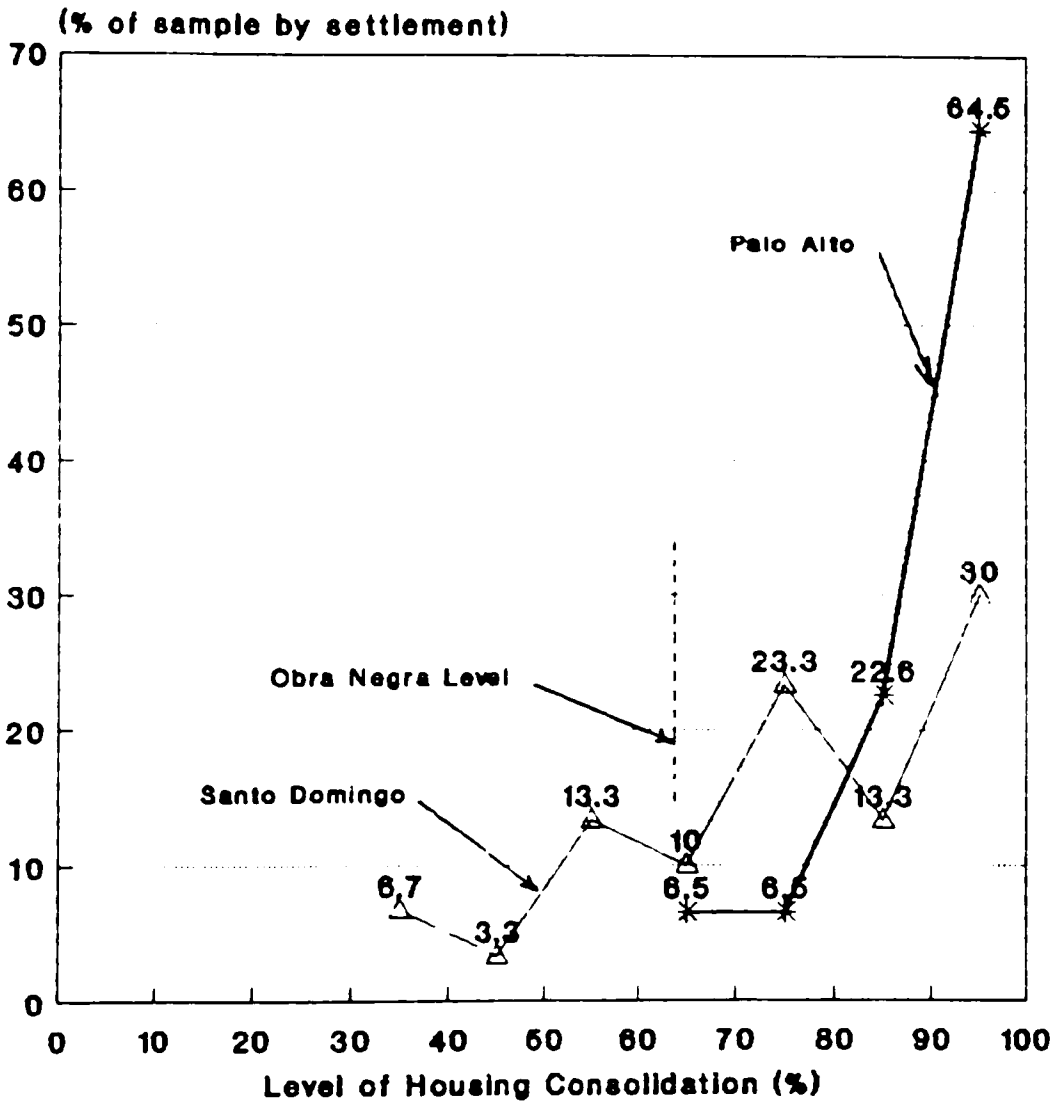
Interval (%)	House Level of Consoli- dation	
	count	%
=====		
UDEVHOR		
n		27
mean		89.60
minimum		62.70
maximum		97.19
s		8.38
variance		70.25

INDIVIDUALISTIC SETTLEMENTS

Interval (%)	House Level of Consoli- dation	
	count	%
=====		
REFORMA URBANA		
n		30
mean		62.86
minimum		15.60
maximum		92.70
s		18.46
variance		340.83

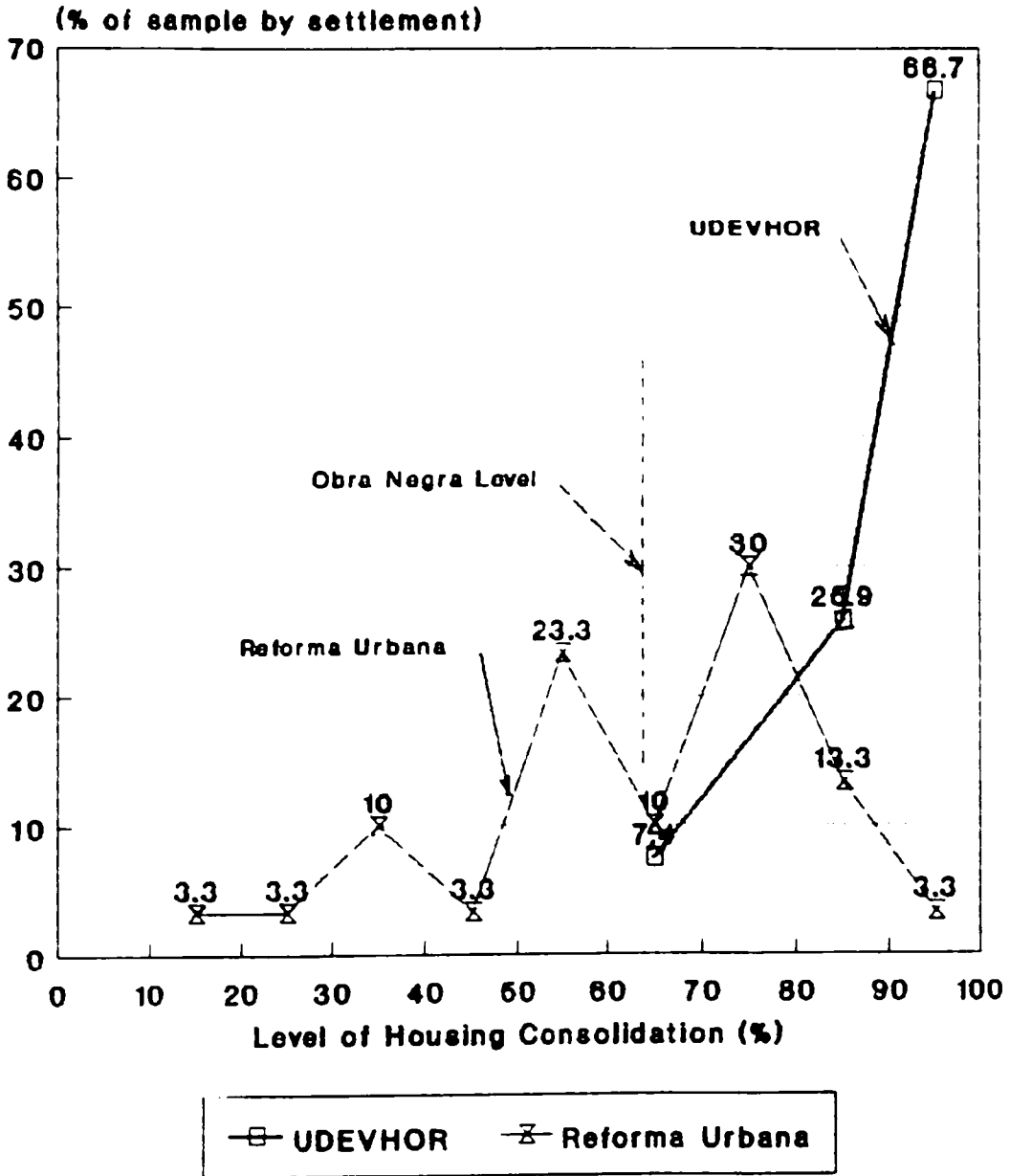
MEXICO CITY

Housing Consolidation Levels



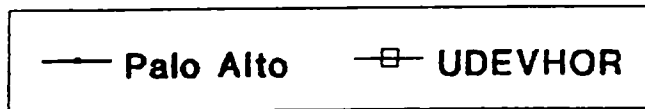
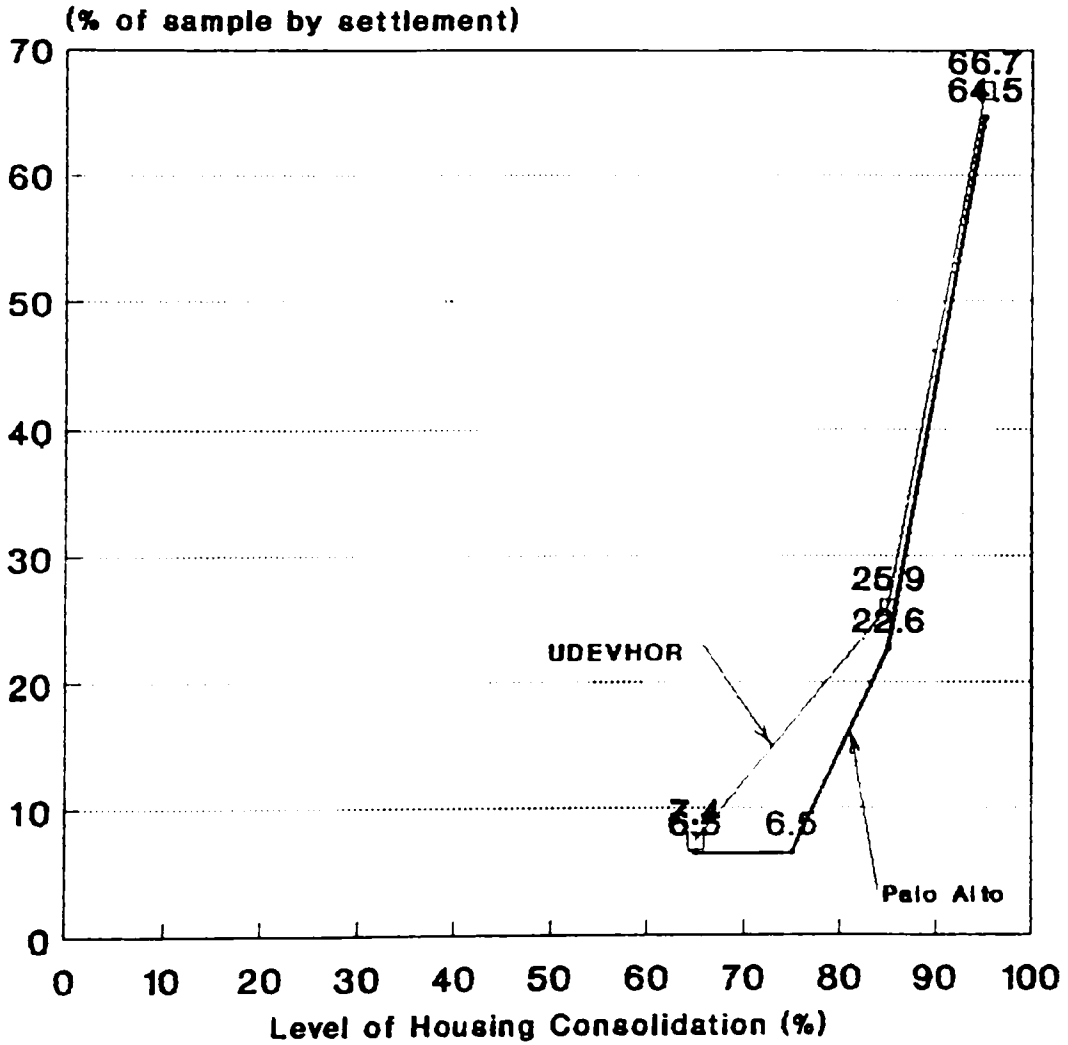
TLALNEPANTLA

Housing Consolidation Levels



COMMUNITY-BASED SETTLEMENTS

Housing Consolidation Levels

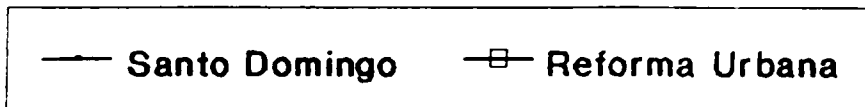
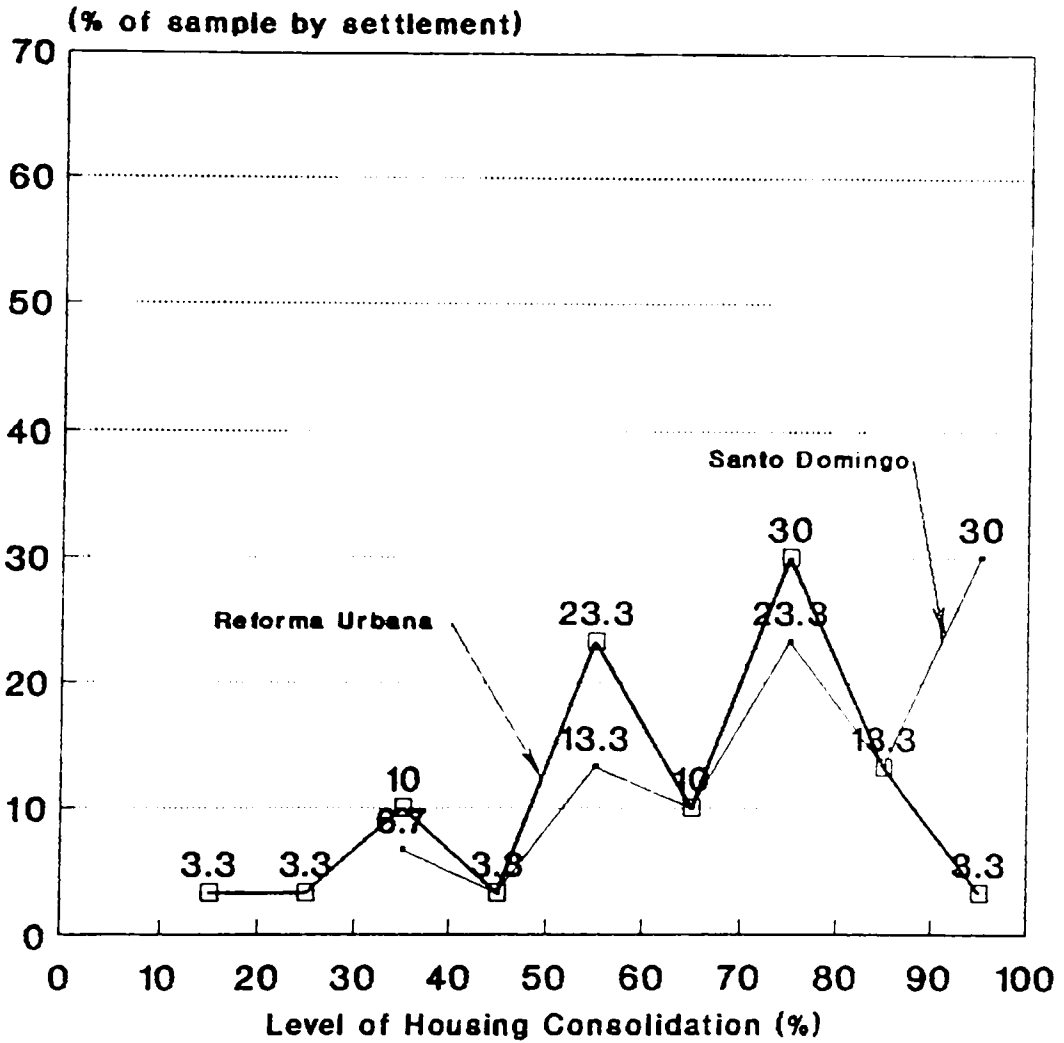


Palo Alto = Mexico City
UDEVHOR = Tlalnepantla

CHART CON - 8

INDIVIDUALISTIC SETTLEMENTS

Housing Consolidation Levels



Santo Domingo - Mexico City
 Reforma Urbana - Tlalnepantla

TABLE CON - 9

WELCH- TEST

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL AVER-
AGES

Study: Mexico City

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_a: \mu_1 > \mu_2$$

	Community-Based	Individualistic
names	Palo Alto	Santo Domingo
n	31	30
\bar{x}	90.51	75.37
s^2	105.05	327.92

difference of means $(\bar{x}_1 - \bar{x}_2) = 15.14$

Degrees of Freedom (Welch method): 47

 $s(\bar{x}_1 - \bar{x}_2) =$ square root of

$$[(s_1^2/n_1) + (s_2^2/n_2)] = 3.784$$

t-test:

$$t = (\bar{x}_1 - \bar{x}_2) - (\text{diff. pop. means} = 0) / S(\bar{x}_1 - \bar{x}_2)$$

$$t = 4.001$$

2-tailed, alpha = .05, d.f. = 47.

$$\text{C.V.} = 2.01$$

The observed difference in the sample means $(\bar{x}_1 - \bar{x}_2) = 15.14$ is 4.001 standard errors above the null hypothesis value (population means difference = 0).

$$t = 4.001 > \text{c.v.} = 2.01$$

REJECT NULL HYPOTHESIS

Thus the mean level of housing consolidation levels in Mexico City for the Community-based settlement Palo Alto is greater than that of the Individualistic settlement Santo Domingo.

The probability that the observed difference between the sample means [$(\bar{x}_1 - \bar{x}_2) = 15.14$] would have occurred by chance, in fact the null hypothesis ($\mu_1 - \mu_2 = 0$) is true, is less than .05.

(Hinkle et al 1977: 209-211).

TABLE CON - 10

WELCH- TEST

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL AVER-
AGES

Study: Tlalnepantla

$$H_0: \mu_1 - \mu_2 = 0$$

$$H_a: \mu_1 > \mu_2$$

names	Community-Based	Individualistic
	UDEVHOR	Reforma Urbana
n	27	30
\bar{x}	89.60	62.86
s^2	70.25	340.83

difference of means ($\bar{x}_1 - \bar{x}_2$) = 26.74

Degrees of Freedom (Welch method): 42

s($\bar{x}_1 - \bar{x}_2$) = square root of

$$[(s_1^2/n_1) + (s_2^2/n_2)] = 3.737$$

t-test:

$$t = (\bar{x}_1 - \bar{x}_2) - (\text{diff. pop. means} = 0) / S(\bar{x}_1 - \bar{x}_2)$$

$$t = 7.155$$

2-tailed, alpha = .05, d.f. = 42.

$$C.V. = 2.01$$

The observed difference in the sample means ($\bar{x}_1 - \bar{x}_2$) = 26.74 is 7.155 standard errors above the null hypothesis value (population means difference = 0).

$$t = 7.155 > c.v. = 2.01$$

REJECT NULL HYPOTHESIS

Thus the mean level of housing consolidation levels in Tlanepantla for the Community-based settlement UDEVHOR is greater than that of the Individualistic settlement Reforma Urbana.

The probability that the observed difference between the sample means $[(\bar{x}_1 - \bar{x}_2) = 26.74]$ would have occurred by chance, in fact the null hypothesis $(\mu_1 - \mu_2 = 0)$ is true, is less than .05.

(Hinkle et al 1977: 209-211).

TABLE CON - 11

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL

AVERAGES

=====

Study: Individualistic Settlements

Ho: $u_1 - u_2 = 0$ Ha: $u_1 > u_2$

	Mexico City	Tlalnepantla
names	Santo Domingo	Reforma Urbana
n	30	30
\bar{x}	75.37	62.86
s^2	327.92	340.83

difference of means ($\bar{x}_1 - \bar{x}_2$) = 12.51 s^2 (pooled estimate of population variation):

334.375

S ($\bar{x}_1 - \bar{x}_2$) = 4.721405

Degrees of Freedom: 58

t-test:

 $t = (\bar{x}_1 - \bar{x}_2) - (\text{diff. pop. means} = 0) / S(\bar{x}_1 - \bar{x}_2)$

t = 2.649634

2-tailed, alpha = .05, d.f. = 55.

C.V. = 2.00525

The observed difference in the sample means ($\bar{x}_1 - \bar{x}_2$) = 12.51 is 2.649634 standard errors above the null hypothesis value (population means difference = 0).

t @ 2.649634 > 2.00525.

REJECT NULL HYPOTHESIS

Confidence Interval:

$$CI = \text{Statistic} \pm (\text{C.V.} \times S(\bar{x}_1 - \bar{x}_2))$$

$$\alpha = .05 \quad CI = 1 - \alpha = .95$$

$$CI = (21.95281, 3.067189)$$

Ha: housing consolidation levels of Community-Based settlement > level of Individualistic settlement.

Observed value of $t = 2.649634 > t(\text{cv})$ with directional alternative = 1.671 in one-tailed test.

Ho rejected at $\alpha = .05$.

Thus the differences in the means of the housing consolidation levels between the Mexico City and the Tlalnepantla Individualistic settlements are statistically significant.

The probability that the observed difference between the sample means ($\bar{x}_1 - \bar{x}_2 = 12.51$) would have occurred by chance, if in fact the null hypothesis ($\mu_1 - \mu_2 = 0$) is true, is less than .05.

Based on the statistical analysis, we are 95 percent confident that the interval noted above contains the difference between μ_1 and μ_2 .

(Hinkle, et al 1979)

TABLE CON- 12

F - STATISTIC TEST.

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL VARIATIONS BETWEEN COMMUNITY-BASED AND INDIVIDUALISTIC SETTLEMENTS

=====

City: Mexico City

$$H_0: \text{var1}^2 = \text{var2}^2$$

$$H_a: \text{var1}^2 \text{ not} = \text{var2}^2$$

	1	2
	Community-Based	Individualistic
settlement:	Palo Alto	Santo Domingo
n	31	30
\bar{x}	90.51	75.37
s^2	105.05	327.92

$$H_0: \text{var1}^2 = \text{var2}^2; \quad \text{var1}^2/\text{var2}^2 = 1;$$

$$\alpha = .10$$

$$F = s_1^2/s_2^2 = 3.121561 \text{ (s1 being larger value)}$$

$$\text{d.f.1} = (n_1 - 1) \quad 29$$

$$\text{d.f.2} = (n_2 - 1) \quad 30$$

$$2\text{-tailed test. } \alpha = .10$$

$$\text{each tail @ .05} = 1.84$$

$$\text{reciprocal: } 0.543478$$

$$\text{C.I.: (1.696500, 3.3856)}$$

REJECT HYPOTHESIS THAT VAR1 = VAR2.

The probability that the observed ratio of the variances from the independent samples ($s_1^2/s_2^2 = 3.121561$) would have occurred by chance if, in fact, the population variances are equal is less than .10. Further, based upon the 90 percent confidence interval of the variation, we conclude with 90 percent confidence that the interval noted above contains the ratio of the two housing consolidation variances.

(Hinkle, et al 1979)

TABLE CON - 13

F - STATISTIC TEST.

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL VARIATIONS BETWEEN COMMUNITY-BASED AND INDIVIDUALISTIC SETTLEMENTS

=====

City: Tlalnepantla

 $H_0: \text{var1}^2 = \text{var2}^2$ $H_a: \text{var1}^2 \text{ not} = \text{var2}^2$

	1	2
	-----	-----
	Community-Based	Individualistic
	-----	-----
settlement:	UDEVHOR	Reforma Urbana
	-----	-----
n	27	30
\bar{x}	89.6	62.86
s^2	70.25	340.83

 $H_0: \text{var1}^2 = \text{var2}^2; \text{var1}^2/\text{var2}^2 = 1;$

alpha = .10

 $F = s_1^2/s_2^2 = 4.851672$ (s1 being larger value)

d.f.1 = (n1-1) 29

d.f.2 = (n2-1) 26

2-tailed test. alpha = .10

each tail @ .05 = 1.9083

4.8516 > 1.9083

REJECT HYPOTHESIS THAT VAR1 = VAR2.

The probability that the observed ratio of the variances from the independent samples ($s_1^2/s_2^2 = 4.851672$) would have occurred by chance if, in fact, the population variances are equal is less than .10. Further, based upon the 90 percent confidence interval of the variation, we conclude with 90 percent confidence that the interval noted above contains the ratio of the two housing consolidation variances.

(Hinkle, et al 1979)

TABLE CON - 14

F - STATISTIC TEST.

TESTING DIFFERENCES IN HOUSING CONSOLIDATION LEVEL VARIATIONS BETWEEN SAME SETTLEMENT TYPES

=====

Study: Community-Based Settlements

$$H_0: \text{var1}^2 = \text{var2}^2$$

$$H_a: \text{var1}^2 \neq \text{var2}^2$$

	1	2
settlement:	Palo Alto	UDEVHOR
n	31	27
\bar{x}	90.51	89.6
s^2	105.05	70.25

$$H_0: \text{var1}^2 = \text{var2}^2; \text{var1}^2/\text{var2}^2 = 1;$$

$$\alpha = .10$$

$$F = s_1^2/s_2^2 = 1.495373 \text{ (s1 being larger value)}$$

$$\text{d.f.1} = (n_1-1) \quad 30$$

$$\text{d.f.2} = (n_2-1) \quad 26$$

2-tailed test. $\alpha = .10$

$$\text{each tail @ .05} = 1.9$$

$$1.495373 < 1.9$$

FAIL TO REJECT HYPOTHESIS THAT VAR1 = VAR2.

(Hinkle, et al 1979)

TABLE CON - 15

===== HOUSING CONSOLIDATION SURVEY =====

City: Mexico
Colonia: Palo Alto
House No. 7
=====

Space: Living Room
=====

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		8	
Lavatory	0				
Water Clo	0				
Shower	0				
	5		50		48

Space: Bedroom #1
=====

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		10	
Lavatory	0				
Water Clo	0				
Shower	0				
	5		50		50

=====

TABLE CON - 15 CONTINUED

Space: Kitchen

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		10	
Lavatory	1	10		10	
Water Clo	0	0			
Shower	0	0			
	6	60		60	
Kitchen Factor (x2)			120		120

Space: Bath

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		10	
Lavatory	1	10		0	
Water Clo	1	10		0	
Shower	1	10		10	
	8	80		60	
Bath Factor (x2)			160		120

TABLE CON - 15 CONTINUED

Space: Bedroom #2

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		10	
Lavatory	1	10		10	
Water Clo	0	0			
Shower	0	0			
	6		60		60

Space: Bedroom #3

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		10	
Walls	1	10		10	
Ceiling	1	10		10	
Doors	1	10		10	
Electric	1	10		10	
Lavatory	0	0			
Water Clo	0	0			
Shower	0	0			
	5		50		50

Space: Exterior

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Exterior	1	200		100	
	1		200		200
Total			690		648

Level of Consolidation (%):
93.91

TABLE CON - 15 CONTINUED

HOUSING CONSOLIDATION SURVEY

=====
 City: Mexico
 Colonia: Palo Alto
 House No. 9

=====
 Space: Living Room

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		7.5	
Walls	1	10		10	
Ceiling	1	10		8	
Doors	1	10		0	
Electric	1	10		10	
Lavatory	0				
Water Clo	0				
Shower	0				
	5		50		35.5

=====
 Space: Dining Room

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		9	
Walls	1	10		10	
Ceiling	1	10		9	
Doors	1	10		0	
Electric	1	10		10	
Lavatory	0				
Water Clo	0				
Shower	0				
	5		50		38

TABLE CON - 15 CONTINUED

Space: Bath

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		9	
Walls	1	10		10	
Ceiling	1	10		8	
Doors	1	10		4	
Electric	1	10		10	
Lavatory	1	10		0	
Water Clo	1	10		0	
Shower	1	10		10	
	8	80		51	
Bath Factor (x2)			160		102

Space: Bedroom #1

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		4	
Walls	1	10		3	
Ceiling	1	10		10	
Doors	1	10		0	
Electric	1	10		10	
Lavatory	0	0			
Water Clo	0	0			
Shower	0	0			
	5		50		27

Space: Bedroom #2

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Floor	1	10		4	
Walls	1	10		3	
Ceiling	1	10		10	
Doors	1	10		0	
Electric	1	10		10	
Lavatory	0	0			
Water Clo	0	0			
Shower	0	0			
	5		50		27

TABLE CON - 15 CONTINUED

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Space: Exterior

Element	No. of Elements Judged	Maximum Value	Total Maximum Value	Judged Value	Total Judged Value
Exterior	1	200		180	
	1		200		200
Total			560		429.5
Level of Consolidation (%):					
76.70					

=====

TABLE CON - 16

The photographs in this table are exhibited to portray an array of levels of consolidation of shelter elements along with appropriate judged levels of consolidation. Ratings follow descriptions and are in parentheses. Fully consolidated = (10). fully unconsolidated = (0).

Photo 1: A bedroom where walls are plastic sheeting and cardboard: (1). A ceiling of cardboard and scrap wood: (1).

Photo 2A (above): A room with a cement asbestos ceiling: (8). Walls are plastered and painted: (10).

Photo 2B (below): An exterior toilet room: (80). [exterior ratings: 0 - 200].

Photo 3A (above): Electricity: (5); walls: (8); ceiling: (8).

Photo 4A (above): Exterior (110) [exterior ratings: 0 - 200].

Photo 4B (below): Walls: (7); ceiling (7).

TABLE CON - 16 CONTINUED

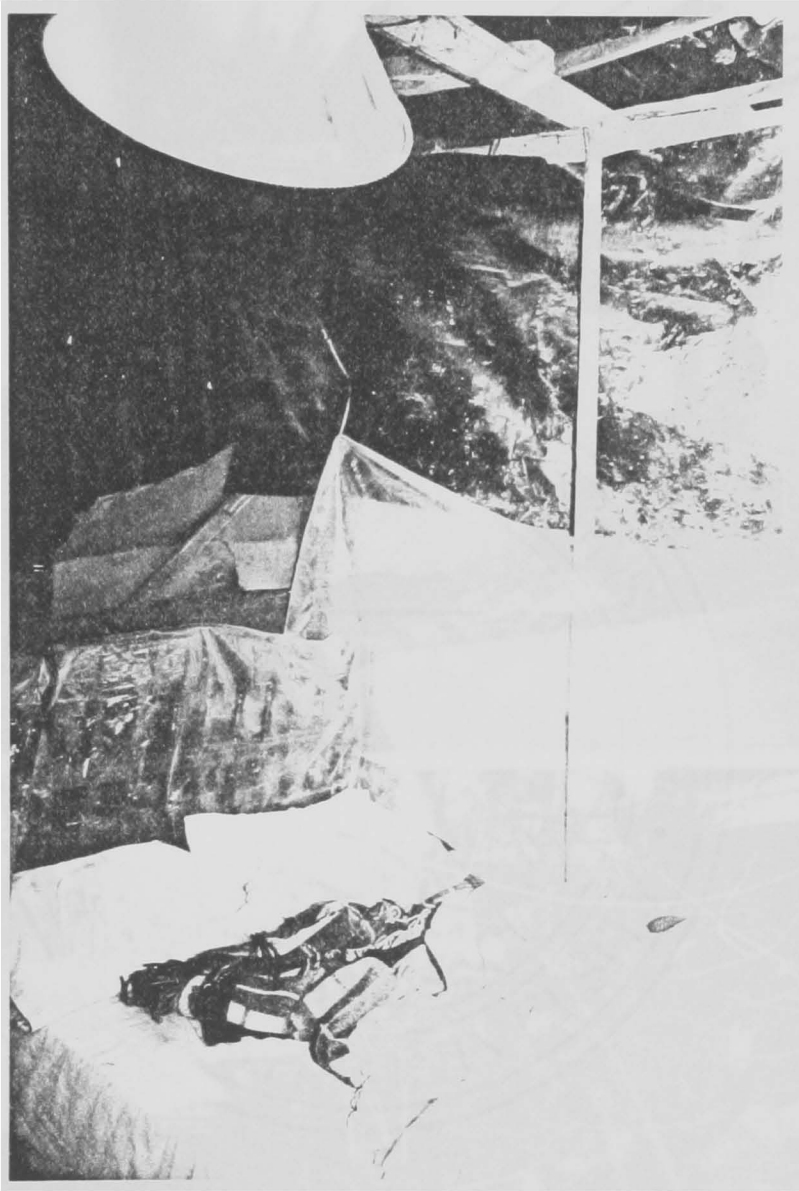
Photo 5: Cement toilet hole built into floor: (2); thin wash of cement for floor: (4); sheet plastic and cardboard walls: (1).

Photo 6: Toilet with sewer connection but no water supply: (5); walls: (6).

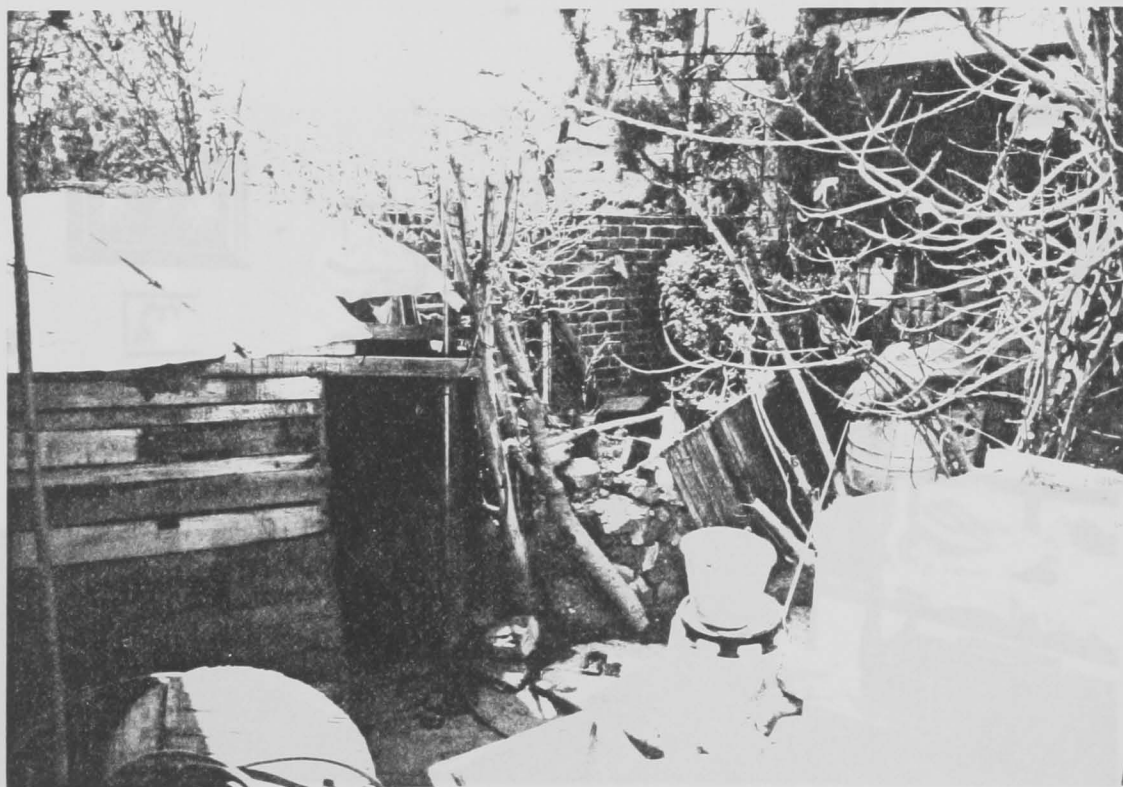
Photo 7: Fully supplied toilet room: all elements at (10).

360

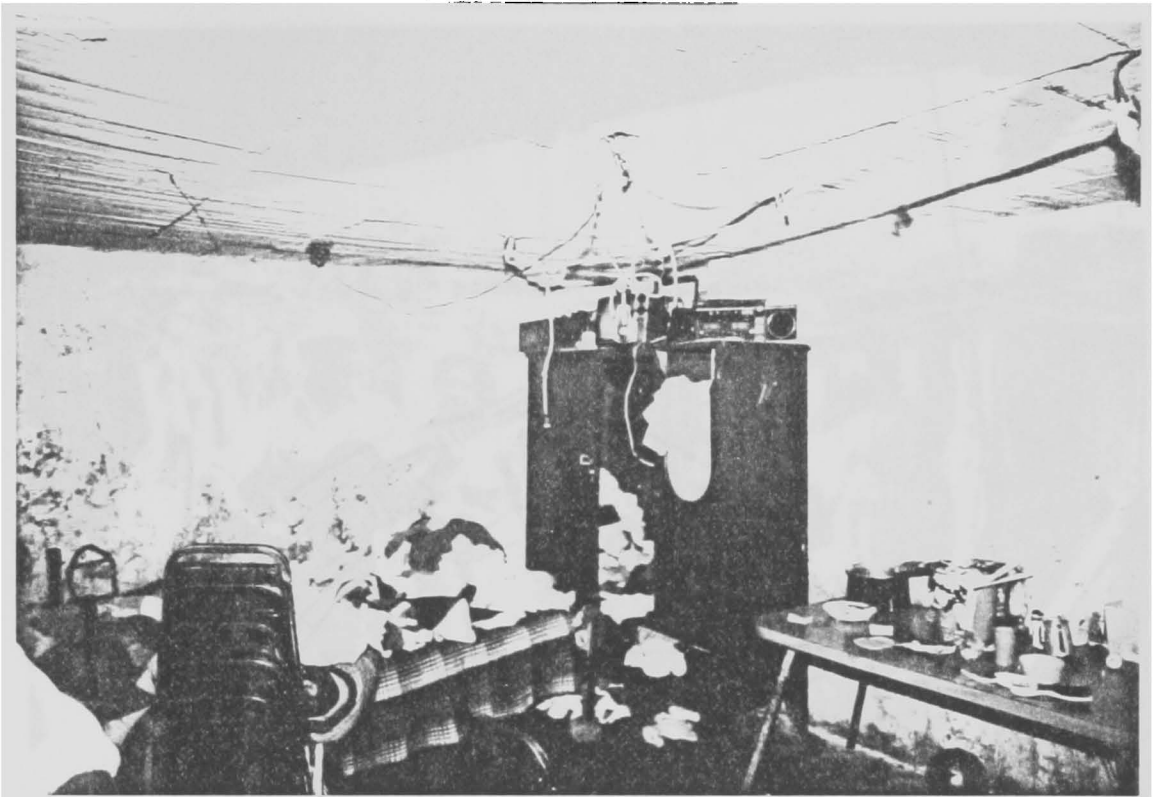
PHOTO 1



PHOTOS 2A AND 2B



PHOTOS 3A AND 3B



PHOTOS 4A AND 4B

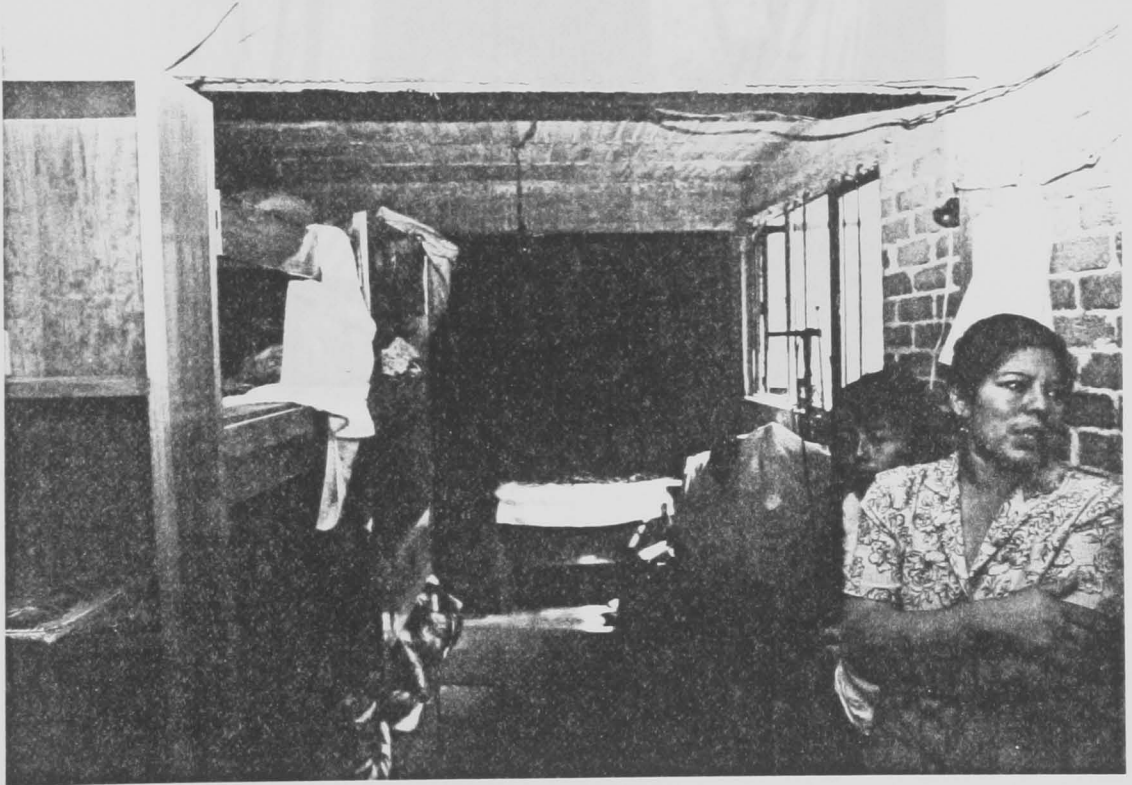


PHOTO 5



PHOTO 6

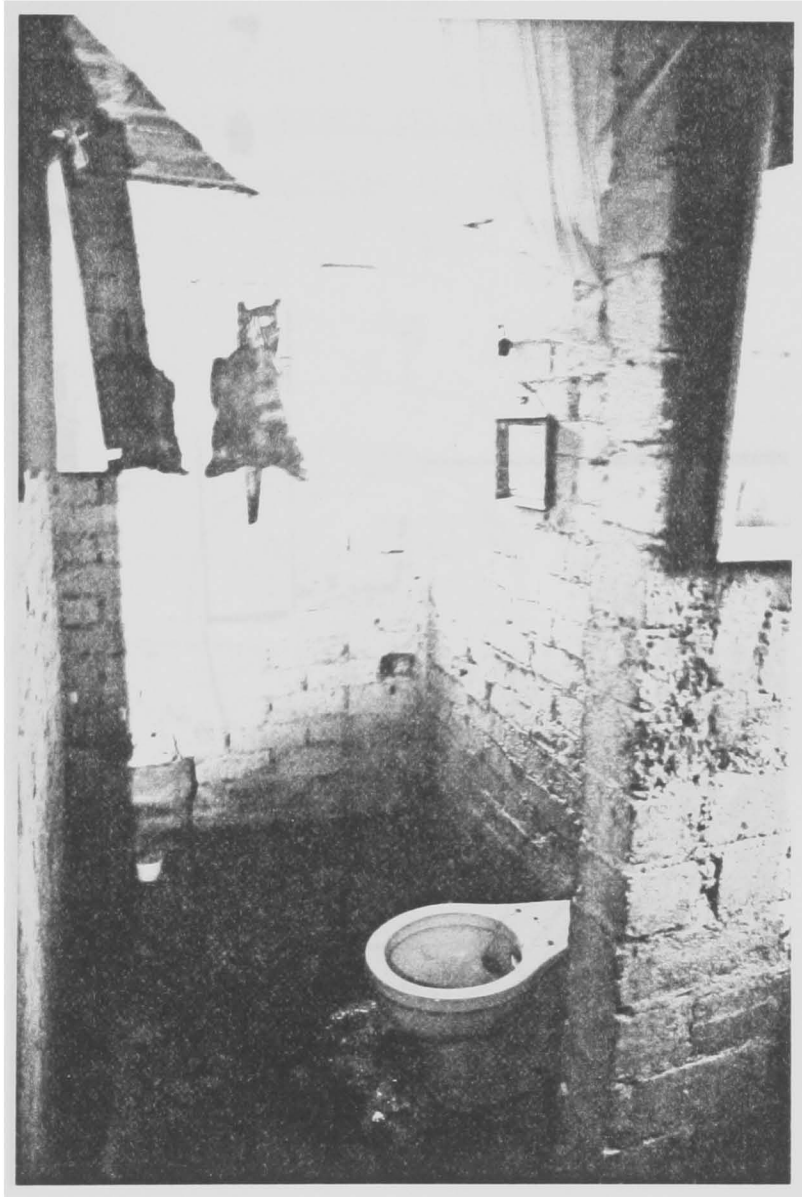
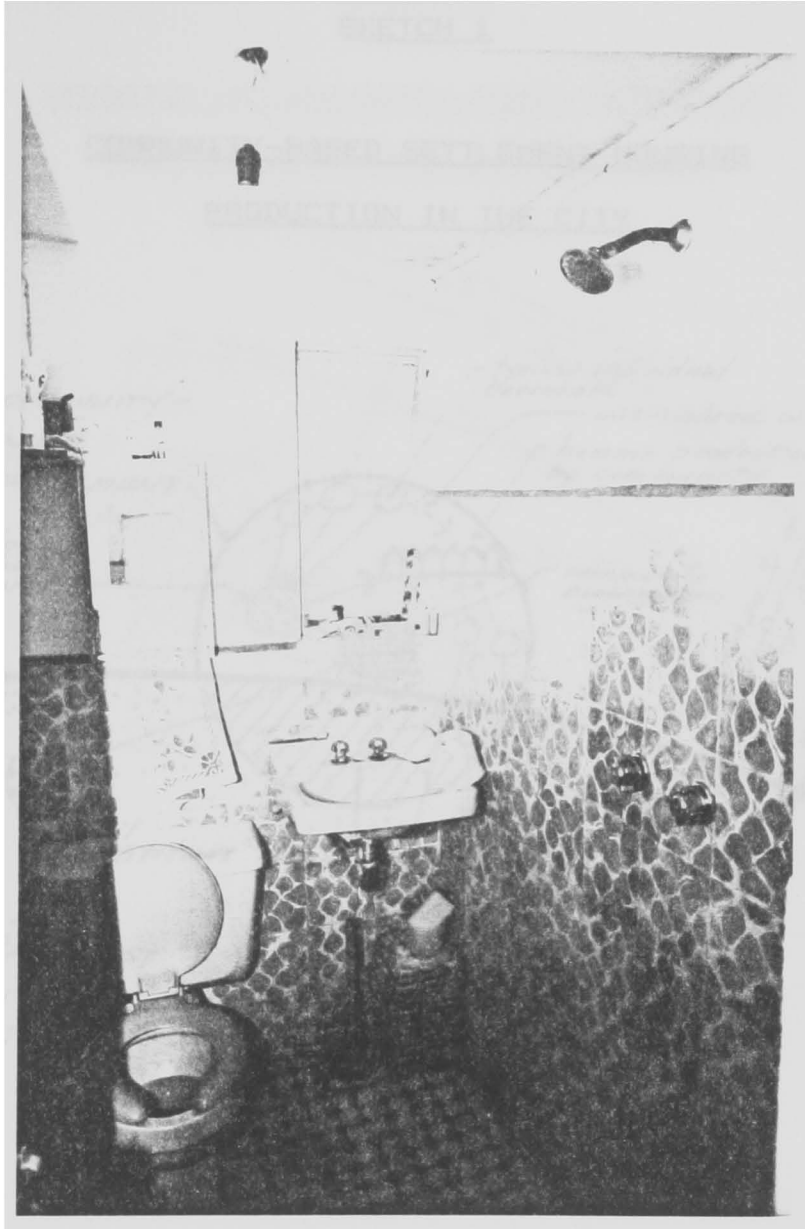


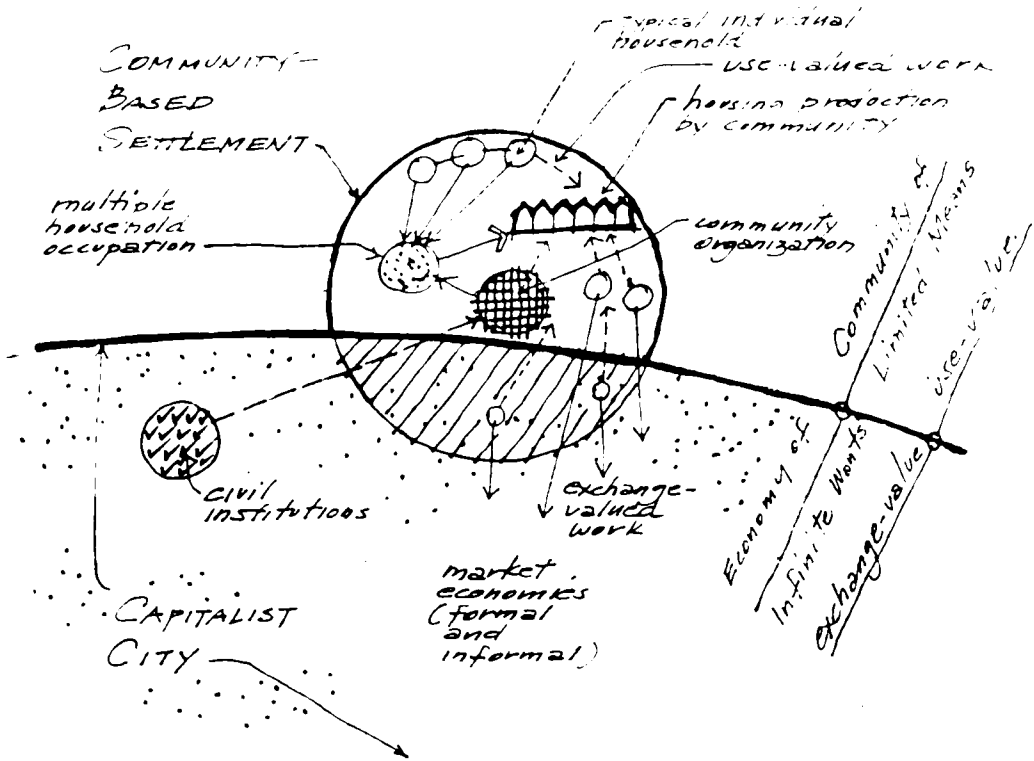
PHOTO 7



SKETCH 1

COMMUNITY-BASED SETTLEMENT HOUSING

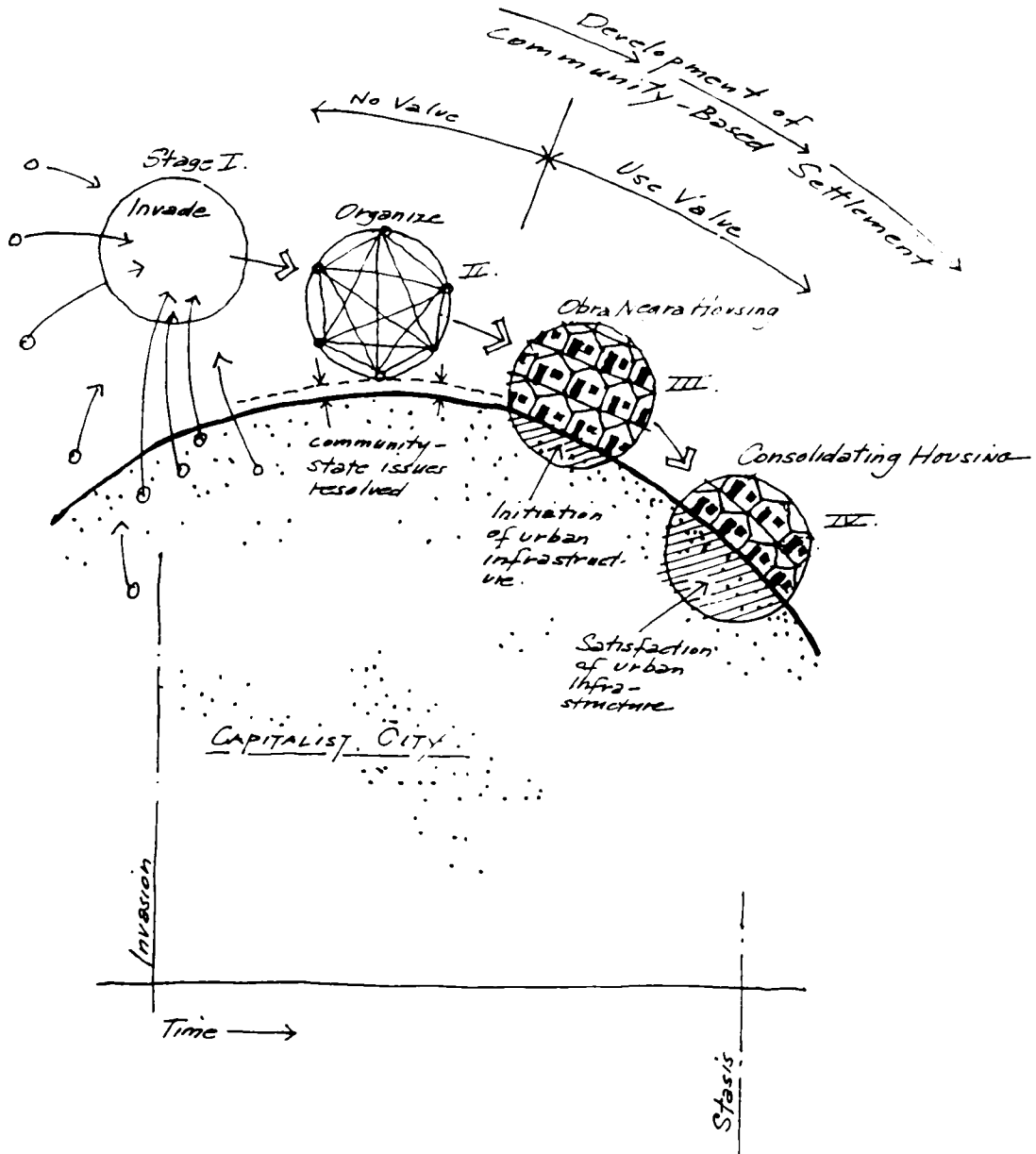
PRODUCTION IN THE CITY



SKETCH 2

DYNAMICS OF COMMUNITY-BASED SETTLEMENT

HOUSING DEVELOPMENT IN THE CITY

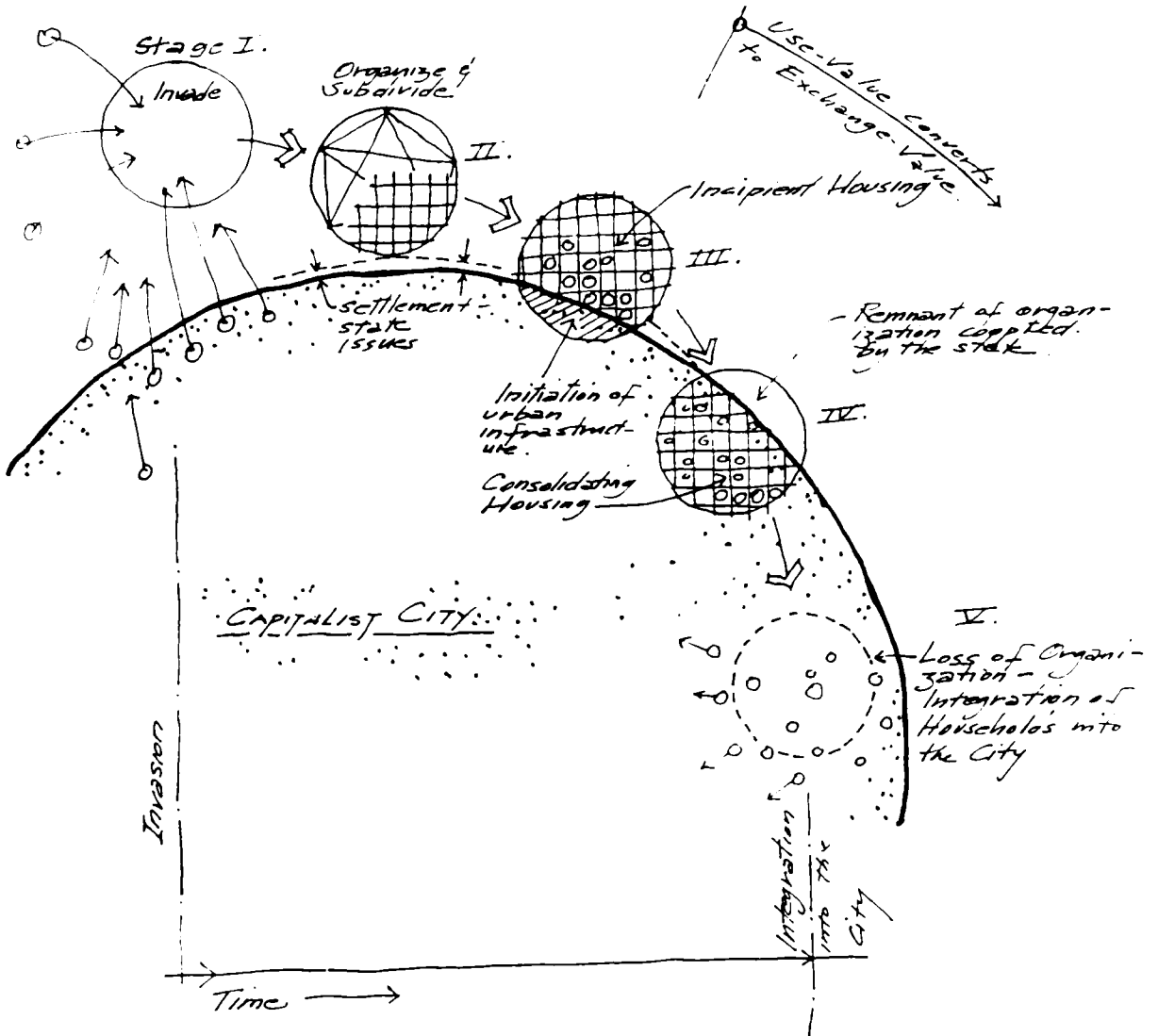


SKETCH 3

DYNAMICS OF INDIVIDUALISTIC SETTLEMENT

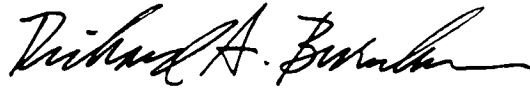
HOUSING DEVELOPMENT AND ITS

RELATIONSHIP TO THE CITY



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PUBLISHED PAPERS

"Two Traditions in Urban Lower-Income Housing Settlements in Mexico" in Traditional Dwellings and Settlements: Working Paper Series. Berkeley: IASTE, U. of California Center for Environmental Design Research. 1990.

Review of Listen to the People: Participant Observer Evaluation of Development Projects by L. Salmen. Oxford: Oxford Univ. Press. 1987. for Environment and Planning C: Government and Policy (London) 7. 1. 1989.

"Changing Common Grounds in Latin American Low-Income Urban Housing Settlements: Mexican Scenarios" in Proceeding of the Association of Collegiate Schools of Architecture (ACSA) West-Central Region Annual Conference. Dept. of Architecture and the College of Design. Iowa State University. Ames. Iowa. 1987.

"Relating the Informal- and the Formal-Sectors to Efficiency and Equity in Third World Urban Housing. Two Case Studies: Marxist Cuba and Capitalist Ecuador." Scholars Forum on International Development. 4. 1986.

PAPERS PRESENTED

"Two Traditions in Urban Lower-Income Housing Settlement in Mexico." International Symposium on Traditional Dwellings and Settlements in a Comparative Perspective. College of Environmental Design, University of California at Berkeley. April, 1988.

"Questioning Theoretical Foundations: Understanding Shelter Design in Latin American Lower-Income Self-Help Urban Housing." Built Form and Culture Research Conference, University of Kansas. Nov. 1986.