What is Unique about Fraccionamientos?

Study of a settlement type in two municipalities in Guadalajara Metropolitan Area

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Executive Summary

The Guadalajara Metropolitan Area (ZMG) is the second major metropolis of Mexico after Mexico City. Its population grew from 2.33 million to 4.18 million between 1980 to 2010. Bulk of the urban expansion in the ZMG corresponds to the rapid growth of fraccionamientos, defined as complexes of housing units of the same or similar type constructed by developers, usually in large-scale and often subsidized by state housing programs. While in the literature urban expansion in Latin American cities is often portrayed as led by land invasion and informal settlements (“urbanización popular”), this paper focuses on this parallel urbanization process driven by the proliferation of fraccionamiento-type settlements, in which state, private capital and low- and middle-income formal working class actively participate. I would like to respond to the following two questions:

- What are the differences and similarities exist between fraccionamientos and non-fraccionamiento-type settlements, in terms of demographic characteristics, socioeconomic conditions and housing conditions?
- How are fraccionamientos heterogeneous?

Using the 2010 Mexican Census data (at manzana-level), I developed analytical maps to address these two questions, based on the case of El Salto and Tlajomulco de Zúñiga, two fast growing peripheral municipalities of the ZMG with high level or marginality. I found that fraccionamiento residents tend to have (1) younger age structure with higher child dependency ratio and lower aged dependency ratio and (2) lower fertility rates and smaller household size. They are also more likely to be married or in free union, and enjoy higher education level than the general population. Though residents may not necessarily have higher income level than others, they are more likely to be employed in the formal sector, and thus get more access to benefits associated with employment status.

There is a favorable evolution of housing conditions in Mexico over the last 25 years, while housing deficit and inequality remain as major challenges. This paper will be a contribution to our understanding on the heterogeneity of low-income population’s option to housing.
Introduction

Housing policy and housing development of Mexico:

Having access to housing is a constitutional right in Mexico¹. The Mexican government has been intervening in the housing issue since the foundation of the country’s first Housing organism in 1925. The country’s housing policies have undergone qualitative changes over the last eight decades, especially after the 1980s economic crisis/ restructuring and the subsequent transformation of the nature and forms of state intervention. Generally speaking, the Mexican housing policy follows two general lines: (1) in the formal sector, public agencies have provided funds mainly for the construction of owner-occupied homes and (2) in the informal sector, the principal form of state action has been the gradual improvement, regularization and servicing of irregular settlements (Gilbert and Varley 1991:42). Studies also suggest that the state has been transformed from a constructor that in many cases directly led the housing construction to a facilitator that helps to channel resources to private land developers (for a more thorough discussion, see Puebla 2002).

The diverse housing organisms and programs in the country are designed to target the needs of social groups with different socioeconomic status and to cover the entire life cycle of houses (from construction, consolidation to restoration). Theoretically this institutional design is fairly inclusive. Major housing organisms include: INFONAVIT (Institute of National Fund for Workers’ Housing), providing a series of housing-related mortgage products to the formal, salaried sector (Its resources mainly come from employers’ contribution of 5% of the employees’ salary, as well as subsidies from the Federal Government and profits from its own investment); FONAHPO (National Fund for Popular Housing) attending the needs of self-employed population with income lower than 2.5 minimum wages; FOVISSSET (Housing Fund of the Institute of Social Securities and Social Services for Workers for the State) serving government employees; and FOVI targeting mainly “low-income population” and the social-interest housing. Until late 1980s, major problems of these organisms were 1) de-capitalization and 2) being appropriated by the ruling party as instrument of political patronage (Schteingart and Graizbord 1998). Recently, participation in the housing programs has increased² and social-interest housing funding is more transparent. However, in a general environment of deregulation, corruption, informality and exclusion of the poor remain serious challenges (for a more detailed discussion, see Harner et al. 2009 and Lopez Paniagua 2004).

There is a favorable evolution of housing conditions in Mexico over the last 25 years, especially given the context of the economic crisis in 1980s and 1990s. This phenomenon can be partly explained by demographic changes, but also attributable to the efforts of residents and public housing organisms. Population growth rate in Mexico declined and was surpassed by housing growth rate in 1970s, both in urban and rural areas. Occupants per room dropped from 2.2 in

¹ Article 4 of the Mexican Constitution: “Toda la familia tiene derecho a disfrutar de vivienda digna y decorosa. La ley establecerá los instrumentos y apoyos necesarios a fin de alcanzar tal objetivo”.

² From 2001 to 2007, INFONAVIT granted more than 2 million credits, which counted over 85% of all loans granted in the program’s entire history (Harner et al. 2009).
What is Unique about Fraccionamientos?

1980 to 1.6 in 2000. Other index of housing conditions also shows signs of improvement\(^3\). However, based on the 2000 Census, the Programa Sectorial de Vivienda (2001-2006) identified that the country still had a housing deficit of 1,810,930 units with another 2,479,735 in need of repairs (CONAFOR 2005). Moreover, the general improvement in housing conditions does not benefit equally to all social groups. For example, only 11.5% of government credits in Guadalajara went toward house purchases in the economic or lower traditional categories (up to 20,400 dollars), and the bulk of credits went to purchase homes in the $20,000-30,000 range (Harner et al. 2009).

Housing market in Mexico is segmented into various “submarkets”, which suggest different forms of access to housing (based on Coulomb 2010, modified by the author). These include:

- Self-constructed housing, which makes up 60% of the country’s housing stock
- Housing built by developers and sold to those who have access to bank mortgage (usually middle and upper class)
- Housing built by developers in coordination with, and subsidized by, the state (i.e. public housing organisms provide subsidized credit for its purchase). This category can be further classified into 4 subgroups: basic housing, social housing, economic housing and moderate housing

The existence of these submarkets reveals the inequality housing in the country. Households’ access to different submarkets largely depends on household’s socioeconomic conditions, such as employment status, income and access to diverse social programs of housing (Coulomb 2010). Typically, those with more than 8 minimum wages enjoy access to housing constructed by developers with mortgages; those whose income is lower than 2 minimum wages usually only have access to self-built housing with precarious conditions (ibid).

Urbanization and housing development in Guadalajara

The Guadalajara Metropolitan Area (a.k.a. ZMG) is the second major metropolis of Mexico after Mexico City. It has incorporated its adjacent municipalities since 1980s. Its size grew from 20,000 hectares (4 municipalities) in 1980 to 60,000 (8 municipalities) in 2010, and its population grew from 2.33 million to 4.18 million over the same period. In 2005, the ZMG concentrated 60% of the population of Jalisco.

Within the metropolitan area, however, the urbanization follows a three-ring pattern (Map 1). Between 2005 and 2010, the population of Guadalajara municipality decreased by 6.60% (or 105,012 in absolute number); the heads of the three near-peripheral municipalities, Tonalá, Zapopan and Tlajomulco experienced moderate population growth (Zapopan by 11.30%, Tlaquepaque by 6.25% and Tonalá by 9.22%). The fastest population growth takes place in the third ring, which consists of municipalities of El Salto and Tlajomulco de Zúñiga and the far peripheral localities of Zapopan and Tonalá. The growth of housing shows a similar pattern: between 2005 and 2010, Guadalajara’s housing units modestly increased only by 0.54%, meanwhile housing units in the heads of the three near-peripheral municipalities, Tonalá, Zapopan and Tlajomulco, grew by 13.84%, 18.85% and 13.45%. The fastest growing ring consists of the far-peripheral localities of Zapopan, Tonalá, Tlajomulco de Zúñiga and El Salto.

\(^3\) For example, the proportion of housing with access to electricity increased from 75.1% to 96.6% between 1980 and 2000 (Coulomb 2010)
What is Unique about Fraccionamientos?

where housing stocks often doubled\(^4\). In terms of urban spatial expansion, between 2000 and 2005, 10 new urban localidades were created in the ZMG (Map 2): 8 in Tlajomulco de Zuniga, 1 in El Salto and 1 in Tlaquepaque. Between 2005 and 2010, 2 more new urban localidades were created, 1 in Tlajamulco de Zuniga and 1 in Tonala. In sum, most of the urban growth takes place at a belt zone of far peripheral area (urban growth in the central area takes another form—such as development of high-rise residential buildings, gated community and country club etc.). It is also important to note that the rapid urban expansion in the “third ring” in the ZMG is accompanied by high vacancy rates. This implies certain degree of speculation. While Guadalajara metropolitan area is increasingly articulated to the global economy, it also becomes fragmented and polarized. Its peripheral municipalities such as El Salto and Tlajomulco de Zuniga have been transformed from local centers of agricultural economy to exclusive residential area for low- and middle-income population, with high level of social exclusion (Rodríguez Bautista and Cota Yánez 2006).

Harner and his colleagues (2009) found that, in the four major municipalities in the ZMG (Guadalajara, Zapopan, Tlaquepaque and Tonala), social-interest housing programs developed 6,814 hectares from 1970 to 2000; in 2000 they housed 809,845 habitants out of a total population of 1,978,195 in these four municipalities, while informal settlements house about 941,390 people. Ratio of land developer to the number of projects and ratio of owner to the number of parcels have steadily declined in the city, which suggest few large investors purchasing and selling land in a speculative market and a few large developers building more of the projects. The 1990s saw large increases in both the number of social-interest housing project built, but involving a lot of informality (ibid.).

\(^4\) For example, housing units in Hacienda Santa Fe increased by 130.60%, 592.29% in Hacienda Fresno, 456.53% in Lomas del Sur (all of them in Tlajomulco de Zuniga); 59.47% in San Jose del Castillo, 67.04% in Fraccionamiento Alameda and 188.11% in the Galaxia Bonito Jalisco (El Salto).
Population and Housing Growth in Metropolitan Area of Guadalajara (ZMG)

Note:
This Map shows the "Three-Ring Pattern" of urbanization in Guadalajara. The first ring, the municipality of Guadalajara, shows negative population growth and modest housing growth. The second ring (near periphery, including towns of Zapopan, Tonalá, and Tepic) shows growth both in population and housing. The third ring (far periphery, including municipalities El Salto, Tepemixco, Juchitán, and others) shows the fastest growth both in population and population.

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Source:
1. Censo de Población y Vivienda 2010, Principales Resultados por AOE y Manzana Urbana, Instituto Nacional de Estadística y Geografía
2. Censo de Población y Vivienda 2000, Principales Resultados por Localidad (ITER), Instituto Nacional de Estadística y Geografía

Projection: International Terrestrial Reference Frame 1992 Lambert Conformal
Map 2: Creation of New Urban Localidades in Guadalajara Metropolitan Area

Source:
1. Censo de Población y Vivienda 2010, Principales Resultados por AGEB y Manzana Urbana, Instituto Nacional de Estadística y Geografía
2. Conteo de Población y Vivienda 2005, Principales Resultados Por Localidad (ITGER), Instituto Nacional de Estadística y Geografía
3. Conteo de Población y Vivienda 2000, Principales Resultados Por Localidad (ITGER), Instituto Nacional de Estadística y Geografía

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Projection: International Terrestrial Reference Frame 1992 Lambert Conformal
Statement of Problem and Research Questions

Bulk of the urban expansion (in terms of population growth, housing construction and achievement of urban status) in the ZMG corresponds to the rapid growth of fraccionamiento-type settlements. All the twelve new urban localidades created between 2000 and 2010 are composed by fraccionamiento-type settlements. Here I define fraccionamiento as complex of housing units of the same or similar type constructed by developers, usually in large-scale and often subsidized by state housing programs (see figure 1 and 2). While in the literature urban expansion in Latin American cities is often portrayed as led by land invasion and informal settlements (“urbanización popular”), this paper focuses on the parallel urbanization process characterized as the proliferation of fraccionamiento-type settlements, in which state, private capital and low- and middle-income formal working class actively participate.

Rapid development of fraccionamientos satisfies pressing housing demands. It is supposed to come urbanized and with clean titles, and thus reduces the costs of regularization and chaotic spatial organization that characterize the self-built settlements. As it is closely associated with housing organisms such as INFONAVIT, low income, salaried population have access to state subsidies and can get a housing more easily. Its rapid expansion incentivized the construction sector and thus creates jobs. Theoretically, before the developers turn in their work to the municipal government, they are required to help to set up neighborhood organizations which will be trained and be responsible for infrastructure maintenance. This is supposed to strengthen the civil society.

In practice, however, the proliferation of fraccionamientos also generates various problems. First, many fraccionamientos are developed with high level of informality. For example, many dwellers transform the structure of their houses according to their needs without permission. In not a few cases, the drainage or water system of the fraccionamientos are not integrated into the urban system as required. Second, many of these fraccionamientos are located in isolated far periphery with insufficient public transportation, which creates serious problems for working class families. Third, many of the interviewees report problems of public security within the fraccionamientos. Forth, the rapid expansion of fraccionamientos is partly fueled by land speculation, and vacancy rates in fraccionamientos are high. Some of the unoccupied sections of the fraccionamientos are appropriated by street gangs, which further damaged the social fabrics. Lastly, fraccionamientos are composed by large amount of one- or two-floor units and its expansion is largely horizontal which requires large amount of land. This model may not be sustainable within area already densely populated.

Literature on housing in Mexico has been focusing on informal settlements. On the topic of fraccionamiento scholars have discussed general housing policies and its social/ spatial organizations (Schteingart and Graizbord 1998). This study intends to explore whether residents of fraccionamientos show certain socioeconomic and demographic characteristics that separate

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5 In Tlajomulco de Zuniga and El Salto (combined to have 35 urban localidades), among the ten localidades with the most new housing units constructed between 2005 and 2010, eight are completely composed by fraccionamiento-type settlements (Hacienda Santa Fe with 20,914 new housing units, Lomas del Sur with 8,003 units, El Capulin with 7,395 units, Fraccionamiento Rancho Alegre with 3,923 units, Fraccionamiento Real del Valle with 2,833 units, Galaxia Bonito Jalisco with 2,833 units, Hacienda Los Fresnos with 2,458 units, La Alameda with 2,355 units). Population growth shows a similar pattern- among the 10 localidades with most population growth, 8 of them are completely composed by fraccionamientos.

6 This section is based on the author’s fieldwork in El Salto and Tlajomulco de Zúñiga in summer 2012.
them from those living in other types of settlements such as colonias. It will contribute to our understanding on the heterogeneity of low-income population’s housing management. For policy makers and urban planners, this work will provide useful background information.

This study asks two questions:

• What are the differences and similarities exist between fraccionamientos and non-fraccionamiento-type settlements (often informal settlements in the local context), in terms of demographic characteristics, socioeconomic conditions and housing conditions?

• How are fraccionamientos heterogeneous in terms of demographic characteristics, socioeconomic conditions, and housing conditions?

Figure 1: typical fraccionamiento housing units

Figure 2: typical image of consolidated informal settlement
Methodology
This section includes the following subsections:

1. Acquiring data
2. Mapping context
3. Base map
4. Analytical maps
5. Statistical summary

1. Acquiring data

1) Spatial data

The spatial data in the form of shapefiles used in this paper originally are from INEGI. The projection used in all shapefiles is International Terrestrial Reference Frame 1992.

2) Demographic and socioeconomic data

In the background analysis aimed at identifying urbanization patterns in the Guadalajara Metropolitan Area, I used the 2000 and 2010 Mexican Census data and the 2005 Count of Population and Housing data. Analysis is at localidad level and focuses on the Guadalajara Metropolitan Area. In analysis of socioeconomic and demographic characteristics of fraccionamientos, I use the 2010 Mexican census data. Analysis is at manzana level and targets municipalities El Salto and Tlajomulco de Zúñiga. Data are available on different subjects (population, education, economic conditions, migration, marital status, fecundity, household and housing conditions).

The 2010 census data comes with the shapefiles (in dbf. format). The 2000 Census and the 2005 Count of Population and Housing data are available on the INEGI website (in excel format).

2. Mapping context

This section contains two maps, one on population and housing growth (in percentage) between 2005 and 2010, in all urban localidades in the Guadalajara Metropolitan Area; and the other on the acquisition of urban status of localidades between 2000 and 2010. I then identified that the urbanization process in terms of population and housing growth in the ZMG follows a “three-ring” pattern, and all the recently converted or created urban localidades are located in the south periphery of the ZMG.

3. Base map

This map is used for 1) showing the locations of fraccionamientos within the two studied municipalities, 2) delineating the fraccionamientos on the analytical maps and 3) identifying manzanas that are within fraccionamientos for further statistical analysis. The output is labeled as “fraccionamiento areas”.

4. Analytical maps

I intend to use analytical maps to display the socioeconomic and demographic characteristics of the fraccionamientos and compare them with non-fraccionamiento type settlements. Each analytical map targets one variable, and is created by combining two layers: the base map that
What is Unique about Fraccionamientos?

delineates fraccionamientos and the map that displays the variable at manzana level. My discussion mainly responds to two questions: 1) whether there is obvious difference between fraccionamientos and non-fraccionamiento settlements and 2) whether there is obvious heterogeneity within the fraccionamientos.

The following is a list of variables discussed in the analytical maps. Except for household size, all variables are directly available in the 2010 census data.

- **Demographic:**
  - **Age structure:** percentage of population aged 0-2 and 60+; child dependency ratio and aged dependency ratio;
  - **Fertility rates:** average number of children per woman;
  - **Household:** percentage of households with female head; percentage of households with head aged 30-; household size (dividing total census population by total number of census households);
  - **Migration:** percentage of population living in another federal entity in 2005;
  - **Marital status:** percentage of population aged 12+ married or in free union, percentage of population aged 12+ never married or in free union;

- **Socioeconomic:**
  - **Education level:** percentage of population aged 15+ without any schooling; average schooling years;
  - **Employment status:** unemployment rates (total and by gender);
  - **Access to health insurance:** population without access to any type of health insurance (and the percentage);
  - **Assets:** percentages of households that own car, mobile phone and internet access

- **Housing conditions:**
  - **Housing deficit:** percentage of Private Housing Units with 2.5 Habitants per Bedroom
  - **Infrastructure and delivery of service:** percentage of housing units without access to running water

5. **Statistical summary**

While the analytical maps visualize the patterns, I also use statistical summary (mean and standard deviation) generated by ArcGIS to support my conclusions. For each variable, I first clean the data by selecting in the attribute table only those manzanas with positive values (missing data are coded as negative value in the census data), then I can find the statistical summary in the “statistics” section. I do this to both “manzanas in fraccionamientos” and “all manzanas”, and compare the outcomes.
Map 3: Urban Area by Settlement Type in El Salto and Tlajomulco de Zuniga
Findings

1. Age structure

Compared to non-fraccionamiento settlements, fraccionamientos have slightly higher proportion of children aged between 0-2 (8.40% in fraccionamientos and 7.49% in all manzanas, see Map 4) as well as child dependency ratio (63.87 in fraccionamientos and 60.20 in all manzanas, see Map 5). Also, fraccionamientos have much lower proportion of population aged above 60 (1.91% in fraccionamientos and 4.81% in all manzanas, see Map 6) as well as aged dependency ratio (2.19 in fraccionamientos and 4.82 in all manzanas, see Map 7). However, they have very similar median age (22.35 in fraccionamientos and 22.76 in all manzanas, see Map 8).

2. Total fertility rates

Though not homogenously distributed, total fertility rates are lower than in fraccionamientos than in the non-fraccionamiento settlements (1.97 in fraccionamientos and 2.23 in all manzanas, see Map 9).

3. Households

Generally speaking, household size is smaller in fraccionamientos than in other types of settlements (3.56 in fraccionamientos and 3.77 in all manzanas, see Map 10). In fraccionamientos it is more likely that the household heads are under 30 years old (26.75% in fraccionamientos and 20.33 in all manzanas, see Map 11), and this type of household is concentrated in the South East Section of Hacienda Santa Fe. Prevalence of female headed household is lower in fraccionamientos (18.98% in fraccionamientos and 19.88% in all manzanas, see Map 12).

4. Migration

Percentage of migrants from other states is fairly low both in fraccionamientos and in non-fraccionamiento settlements, though still lower in fraccionamientos (1.05% in fraccionamientos and 3.82% in all manzanas, see Map 13). However, most inter-state migrants seem to be located at the northwest section of Tlajomulco de Zúñiga.

5. Marital status

Fraccionamiento residents (aged above 12) are more likely to be married or in free union than those living in non-fraccionamiento settlements (66.71% in fraccionamientos and 62.35% in all manzanas, see Map 14). The difference is also obvious when it comes to the percentage of population never married or in free union relationship (27.71% in fraccionamientos and 31.43% in all manzanas, see Map 15).

6. Education level

Fraccionamiento residents are more likely to have attended school (percentage of population aged above 15 who never attended school is 0.88% in fraccionamientos and 3.83% in all manzanas, see Map 16). Average year of schooling is also higher in fraccionamientos (9.71 years, meanwhile 8.81 years in all manzanas, see Map 17). Given that the non-fraccionamiento residents at the northwest part of Tlajomulco de Zúñiga tend to have higher education level, the contrast between fraccionamientos and residents of informal settlements in El Salto is even larger.

7. Employment status
With a few exceptions, unemployment rates are fairly low across different types of settlements (2.51% in fraccionamientos and 2.81% in all manzanas, see Map 18).

8. Access to health insurance

There is significant difference between fraccionamientos and non-fraccionamiento settlements concerning access to health insurance. Fraccionamientos have lower percentage of residents who have no access to any type of health insurance (25.12% in fraccionamientos and 33.46% in all manzanas, see Map 19). However, heterogeneity also exists within fraccionamientos.

9. Assets

It seems that there is no significant difference concerning prevalence of car-ownership between fraccionamientos and non-fraccionamiento settlements (54.87% in fraccionamientos and 54.06% in all manzanas, see Map 20). However, the southeast section of Hacienda Santa Fe has very low proportion of car owners. Fraccionamientos seem to have higher proportion of cell-phone users (90.79%, versus 84.43% in all manzanas, see Map 21). Internet access is rare in across most localidades of the two municipalities, with exception to the northwest part of Tlajomulco de Zúñiga, where internet access is common (22.90% in fraccionamientos and 21.46% in all manzanas, see Map 22). Again, the south-east section of Fraccionamiento Santa Fe has lower prevalence of internet access than in other parts of the fraccionamientos.

10. Housing deficit

Percentage of private housing units with 2.5 or more habitants per bedroom is lower in fraccionamientos than in other types of settlements (27.28% in fraccionamientos and 30.45% in all manzanas, see Map 23). However, within fraccionamientos, this proportion is higher in the southeast section of Hacienda Santa Fe.

11. Infrastructure

Percentage of housing units without tap water is unanimously low across fraccionamientos (1.77%, versus 7.88% in all manzanas, see Map 24). It is fairly high in a number of colonias (in some this percentage is over 90%).
What is Unique about Fraccionamientos?
What is Unique about Fraccionamientos?
Map 7: Aged Dependency Ratio

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\text{Aged dependency ratio} = \frac{\text{number of people aged 65 and over}}{\text{number of people aged 15 - 64}} \times 100
\]
What is Unique about Fraccionamientos?
Map 9: Total Fertility Rates
What is Unique about Fraccionamientos?
Map 11: Percentage of Households with Head Aged under 30
Map 13: Percentage of Population Living in Another State in June 2005
Map 14: Percentage of Population Aged above 12 Married or in Free Union

What is Unique about Fraccionamientos?
Map 15: Percentage of Population Aged 12 Above Never Married or in Free Union
Map 15: Percentage of Population Aged 12 Above Never Married or in Free Union

What is Unique about Fraccionamientos?
What is Unique about Fraccionamientos?
Map 18: Unemployment Rates

What is unique about Fraccionamientos?
Map 19: Percentage of Population without Access to Health Insurance
Map 19: Percentage of Population without Access to Health Insurance
Map 21: Percentage of Households Having Cellphone

What is Unique about Fraccionamientos?
Map 22: Percentage of Households with Access to Internet

What is Unique about Fraccionamientos?
Map 23: Percentage of Private Housing Units with 2.5 or more Habitants per Bedroom

% Private Housing Units with 2.5+ Habitants per Bedroom

- Fraccionamiento-type settlements
- Urban localidad boundary
- Municipal boundary

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Source: Censo de Población y Vivienda 2010, Principales Resultados por AGEB y Manzana Urbana, Instituto Nacional de Estadística y Geografía
What is Unique about Fraccionamientos?
Discussion

Based on the analysis in the previous section, I would like to make some conclusions about the recent rapid development of the fraccionamiento-type settlements. It seems that fraccionamientos tend to house a particular group which, in many aspects, stands out of the general population of the two studied municipalities. Residents tend to have a younger age structure with higher child dependency ratio and lower aged dependency ratio. This raises the generational issue. Whereas in informal settlements, a common practice is parents expanding the current house to house their children, it is less feasible in fraccionamientos given the regulations that restrict the flexibility of housing structure. As the rapid development of fraccionamientos is quite recent in El Salto and Tlajomulco, it remains unclear how households in fraccionamientos will face their changing housing demand in ten to fifteen years.

Fertility rates are lower among the fraccionamiento residents than the general population. It is unclear how it happened- it can be attributed to the younger population structure, or to the “neighborhood effects” generated by the particular social and spatial organization in fraccionamientos. It is an intriguing question how the settlement type can impact behaviors such as reproduction. Households in fraccionamientos are smaller, and residents are more likely to be married or in free union. This seems to suggest a selective effect of the fraccionamientos, and broadly speaking, suggests the heterogeneity of the low income population housing decisions.

Concerning socioeconomic conditions, it is clear that fraccionamiento residents enjoy higher education level than the general population (9.71 years of schooling) in the two municipalities (8.81 years); however, this is still lower than in core municipalities such as Guadalajara and Zapopan (respectively 9.99 and 10.38 years of schooling). Fraccionamiento residents may not necessarily have higher income level than the general population, given the similar unemployment rates and percentage of car owners between the two populations. It is the employment status that marks the difference. Fraccionamiento residents are more likely to be employed in the formal sector (access to health insurance is a proxy), and thus get more access to benefits associated with employment status. Again, this reveals the selective effect of fraccionamientos: residents work in the formal sector have access to subsidized credits given by housing organisms such as INFONAVIT.

Compared to informal settlements, fraccionamientos are supposed to be developed and managed with high-level formality. This is largely true given that in many self-built colonias, more than 50% of the houses do not have tap water, which is never the case of fraccionamientos. However, inefficiency in service delivery prevails in fraccionamientos, largely attributable to developers’ intent of cost-reduction. Moreover, a number of fraccionamientos are built on or close to environmentally hazardous areas, and others are not classified as urban settlements (Harner et al. 2009).

While in many aspects, the studied fraccionamientos are quite homogeneous (e.g. proportion of inter-state migrants, fertility rates etc.), in others one can observe considerable heterogeneity. The southeast section of Hacienda Santa Fe, for example, appears as a cluster of young households (with head under 30 years old) with income and education level lower than the rest of fraccionamientos.

This paper contains several limitations: (1) using google earth images to identify fraccionamientos involves limitation on accuracy. (2) Some of the fraccionamientos are not classified as urban and thus are excluded from this paper. It is possible that non-urban
What is Unique about Fraccionamientos?

Fraccionamientos may have more problems with service delivery, and socioeconomic conditions in these settlements are worse than in their urban counterparts. (3) Some of the variables are only the proxy of what I wanted to measure, such as health insurance as the proxy for access to housing programs. (4) Some other important data, such as housing ownership (renter or owner), are missing. Some households may have properties in both colonias and fraccionamientos and thus cannot be classified as “fraccionamiento residents” or “colonia residents”. (5) Census statistics themselves have limitations. For example, some fraccionamientos may have plumbing or tap water, but the quality is precarious (plumbing may not integrated into the urban system), which will not be documented in the census. Finally, the conclusions I obtained above should not be over-generalized to all the fraccionamientos in the Guadalajara Metropolitan Area.
What is Unique about Fraccionamientos?

References


Appendix

Steps to identify “fraccionamiento areas”:

- Identify fraccionamientos: the landscape and spatial organization of fraccionamientos are largely different from colonias. Housing units in fraccionamientos are often of the same model and size, coexisting one by one and the road network within the complex are often like grid. The street view function of Google Earth (see figure 3) also allows me to zoom in and double check.
- Using the Interactive Census Map of INEGI (with localidad, AGEB and manzana boundaries), I identified AGEBs entirely or partially covered by fraccionamientos;
- I selected the AGEBs entirely covered by fraccionamientos and created a new shapefile, named fraccionamientos 1;
- In AGEBs that are only partially covered by fraccionamientos, I selected the manzana(s) that compose fraccionamientos and created a new layer named fraccionamientos 2;
- I Merged fraccionamientos 1 and 2, and created a new layer (see Map 3). The “fraccionamiento area” contains 3,855 manzanas, out of the 8,036 urban manzanas in the two municipalities.

Figure 3: A typical satellite image of fraccionamiento; contrast with the landscape of surrounding informal settlements.