

Measuring self-help home improvements in Texas colonias: A ten year 'snapshot' study

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Abstract

This paper builds on earlier data presented in an *Urban Studies* paper for a major household survey in 2002 that evaluated the impact of title regularization intervention among low-income homeowners in ten colonias in Starr County, Texas. In 2011 the research team returned to those low-income households, oversampling more than half of them in order to compare and analyse the extent and nature of housing improvement, levels of overcrowding and access to home amenities, and the methods of financing for home improvement and extension. Significant improvements and investments were observed totalling an average of almost US\$9000 over ten years, mostly financed out of income and savings, although an increasing trend to seek loans from the formal market was observed. Correlation analysis explores how self-help and self-managed dwelling environments are adapted to family and household dynamics over the life course. Awareness of 'green' housing applications and sustainability is discussed.

Keywords

colonias, home improvements, self-help housing, sustainability

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Introduction

This paper follows up on a previously published paper in *Urban Studies* (Ward et al., 2004) and explores the extent, nature and financing of self-help home improvement activities of long-term owner-households over a ten year period for ten colonias outside of Rio Grande City, Texas. *Colonias* are low-income neighbourhoods developed primarily on low-quality agricultural land in

peri-urban areas and are most frequently associated with counties on the US side of the border with Mexico, although similar informal subdivisions are found quite widely outside of many other cities (Ward and Peters, 2007). Historically, most colonias

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and informal subdivisions have lacked basic infrastructure and utility services and have very poor housing conditions (Arizmendi et al., 2010; Davies and Holz, 1992). Despite the hardships of living in such settlements, purchasing land and self-building or self-managing housing provision informally is the primary means whereby very low-income residents gain a foothold in the property market and subsequently consolidate and upgrade their housing over a long period of time – usually 15–20 years (Ward, 1999). Typically, homeowners purchase a vacant lot and place or construct a temporary or rudimentary structure on the property until resources permit significant upgrades, much of which they undertake themselves.

In this paper we analyse the nature of colonia home-upgrading through a ‘snapshot’ analysis taken at two points in time over ten years: first in 2002, and then again in 2011. In so doing we focus specifically on those households captured in both surveys, many of whom have lived on their current lot and in their current home for much longer than the ten-year time horizon. Indeed, relative immobility of owner-households is a feature of colonias when compared with traditional working and middle-class neighbourhoods. Even if they could sell at a fair market price, most owners would not wish to do so. Colonias offer economic security within a context of flexibility to organise their dwelling and lot environments in order to accommodate family and household expansion. New bedrooms can be added as the family grows, and adult children and their families can be housed in situ, as can elderly parents if and when the time comes (Ward, 2007). Moreover, the family home represents a patrimony that will eventually be inherited by the children, some of whom have expectations to live there once their parents pass away.

This paper offers a temporal perspective about self-help home improvements, and while not a longitudinal analysis it draws

upon two household surveys applied to the same households in a number of colonias with nearly ten years between the baseline and subsequent survey. This allows us to partially reconstruct the household and dwelling history of these families, paying particular attention to the extent and nature of self-help home improvement. While a number of studies in Latin America and elsewhere have examined self-help housing consolidation and household organisation, relatively few authors have done so for colonias in the USA (Donelson and Holguin, 2010; Giusti and Olivares, 2012; Reimers-Arias, 2009; Ward, 1999), and as far as we are aware none have done so using data on the same households at different points in time.

Our paper seeks to complement existing theory about housing conditions and the self-help home improvement in less developed countries, and to explore some of these theories against the backdrop of explanations about the self-help consolidation and improvement processes in colonias and informal subdivisions in Texas and the USA. We explore the significance of formal property titles in directly shaping incentives for home improvement, as well as indirectly through collateralised formal lending. We engage with theories about informal financing, and theory and practice of the impact of micro-lending upon poor households. We also address the way in which the life course and household/family organisation shapes decision-making and outcomes for dwelling consolidation and improvements. To the extent that our work will examine considerations of use and exchange value, we also expect to be able to comment on informal land and housing market assets and behaviour.

We raise four primary research questions: what evidence exists for significant improvement in colonia housing conditions over time; how do colonia homeowners prioritise

and finance home improvement; do they use their homestead as collateral for loans; and how does household structure influence the home improvement process and the intersection of current housing conditions and housing needs? In order to answer these questions, we begin by briefly describing the processes of property acquisition and heavy reliance upon self-help and self-managed housing typical in these settlements. We then move on to explore the extent and nature of housing improvements undertaken by these families over the past ten years, the 'triggers' that appear to be most associated with home improvements, the methods of financing used, and the gain in estimated property values.

In summary, our findings suggest that although housing conditions in colonias were exceedingly poor during the initial stages of housing consolidation, and they continue to be so for the most vulnerable colonia homeowners, on the whole homeowners have made significant investments in their home and the quality of the dwelling has improved markedly. Moreover they do so in close association with the family and household dynamic and changing use values. Only a limited (but rising) number have sought formal loans to finance home improvements, and most continue to rely on incremental self-help and informal financing mechanisms.

Data and methodology

This research draws primarily upon an over-sample of 106 household interviews with long-term colonia homeowner households in ten colonias in Starr County, Texas. Seven of these colonias make up a larger settlement (of more than 1000 households) located just outside of Rio Grande City. Known as Las Lomas, this group of colonias boasts a significant local micro-economy, with a variety of businesses operating throughout, but

particularly along the main road. The three remaining colonias are located 3 to 10 miles further east of Rio Grande City (Colonia B&E, West Alto Bonito and Mike's), each with a couple of hundred households. By the time of the 2002 study all ten colonias had basic utility services (water, electricity and wastewater – either sewer or, more usually, septic systems), and the majority had paved roads on major through streets.¹ Since then infrastructure conditions have changed only minimally and the principal infrastructure problem remaining is the lack of adequate storm drainage, which results in occasional severe flooding. In general, conditions in these settlements are similar to those in colonias throughout Texas, where basic infrastructure and utility services are now fairly common: in 2010, half of colonia residents living in the six counties with the largest colonias populations had water, wastewater, solid waste, drainage and road (i.e. paving) infrastructure, while an additional one-third lived in settlements with water and wastewater services but which lacked adequate paving, drainage or solid waste disposal (Office of the Texas Secretary of State, 2010).

Interviewed in summer 2011, on average households had owned the property for 20 years, with some purchasing as early as 1980, and a few as late as 2000 ($N = 3$). These homeowners comprise a subset of more than 260 households randomly selected and interviewed by researchers in 2002. That subset was drawn from some 1300 cases affected by a title clearing programme undertaken by the Community Resources Group (CRG) on behalf of the State of Texas, which provided clean titles to a large number of families.² The original 2002 study comprised a rare 'natural experiment' whereby 194 randomly selected households who had been given clean titles were interviewed and then compared with a 'control group' ($N = 70$) of randomly selected neighbours who had not

experienced title problems and CRG intervention.³ The aim of that study was to examine the extent to which clean title made a substantive difference in access to formal finance markets, level of home improvement achieved and willingness to invest in further home improvements. Those findings are described in the earlier paper published in *Urban Studies* (Ward et al., 2004) and, counter-intuitively, found few significant differences between the two populations and their housing conditions. However, it could reasonably be argued that in 2002, so soon after title regularization, it was still too early to effectively gauge any housing improvements that might have arisen as a result of receiving clear titles. Therefore, in 2011, we sought to return to these same households with the express purpose of assessing and explaining home improvement and borrowing practices over the ten years.

In 2002 the project team kept detailed field notes regarding the location of each home, the original questionnaire, as well as two oblique photographs of the exterior of each home taken from the street. (The aim was always to conduct later downstream surveys of the type described here.) For the 2011 survey, these original survey files with photographs and notes were used by researchers to try to locate the properties previously studied in 2002. We revisited and sought interviews with an oversample of 264 households, and were successful in being able to survey 106 of them, of whom 89 (75%) were from the original CRG sample and the others were from what we had previously assigned as the 'control group'.⁴ Therefore, given the sample framework, all were long-term residents across ten colonias. Findings from these two snapshot surveys are the focus of the current study, and are considered fairly typical of housing and settlement conditions found elsewhere in the lower Rio Grande Valley and in other border counties.⁵

Housing policies for self-help and sustainability in informal settlements

Studies about self-help housing have largely focused on Latin American metropolitan areas where between 20% and 60% begin as informal settlements at the city periphery (Gilbert and Ward, 1985). Starting as shacks without basic services, structures are consolidated over time through self-building by the families, and since the early 1970s it has been widely argued that this offers poor households a foothold in the housing market, a degree of economic security and opportunities for modest upward mobility (Turner, 1976). Starting in the late 1970s governments began to respond positively to informal self-help settlements in Latin America and elsewhere, such that by 1990 land-title and infrastructure regularization had become the conventional wisdom and primary policy response in support of both home improvement and neighbourhood upgrading (UNHABITAT, 2003).⁶

Since the late 1970s, self-help housing theory argued that irregular settlements represented a positive contribution to private housing supply for the poor – albeit informally – and emphasised affordability, incremental self-financing and the use of 'sweat equity' in dwelling consolidation, flexibility of matching dwelling expansion to family growth and the positive elements of mutual-aid and community participation in neighbourhood development (Turner, 1976; Turner and Fichter, 1972). However, not all scholars at the time bought into such positive interpretations, highlighting the significant social and financial burden that self-help can often place on families (Burgess, 1982; Matthey, 1992; Ward, 1982). More recently some authors have further theorised that the provision of clear title to low-income residents in informal settlements increases upward mobility through greater

tenure security, leverages access to formal lending through collateralisation of the home as asset, and enhances the incentive to invest in the home (De Soto, 2000). Some have even suggested that it leads to smaller family size (Galiani and Schargrodsky, 2010).

As Harris (1999) describes, advocacy and the practice of self-building and self-help among lower-income populations also appear in post-war USA and Canada. Indeed, that author shows that some of the earlier self-help housing policies that eventually gained traction in less developed countries were developed in the USA through USAID (Harris, 1998). Interestingly since the 1990s several of these ideas and policy approaches have begun to turn full circle and now help to inform our thinking about self-help in the colonias and informal subdivisions of Texas and elsewhere (Ward, 1999, 2012). This is because parallel processes of informal self-help are observed in Texas and other southern states, albeit with slightly different manifestations (Arizmendi et al., 2010; Donelson and Holguin, 2010; Mukhija and Monkkonen, 2006). Colonias in the USA are generally smaller in settlement size but residents have much larger lots than are typical for informal settlements in Latin America, and the land acquisition process is usually legal, as unserved lots are sold under contract by developers. Another difference in the USA is the widespread use of manufactured (trailer) homes, self-built structures or a hybrid of the two, but with the common denominator being that the family self-manages the entire dwelling process. Populations are very low-income by US standards, with US\$10,000–16,000 total household income per year in Texas colonias, and US\$12,000–25,000 in non-border informal subdivisions (Ward and Peters, 2007). In Texas, where more than 400,000 residents live in close to 2300 colonias throughout the state (Texas Secretary of

State, 2011), lawmakers and non-profits have since the early 1990s undertaken significant efforts to improve these settlements through regulation, infrastructure provision and increased consumer protection measures (Ward, 1999).

Typically colonia residents have limited access to formal financing since their low incomes, intermittent or uncertain employment, poor credit rating, informal titling practices and widespread title irregularities, and the depressed nature of the housing market conspire against them such that traditional lending institutions (banks and mortgage companies) are reluctant to lend to colonia homeowners – either for lot purchase or home improvements. Thus, most buy a lot from a developer who has platted agricultural or scrub land into tracts without providing basic services. Developers finance the land sales (seller-financing) under a Contract-for-Deed (CfD) arrangement whereby the purchaser only gets the deed when all payments are completed – several years downstream (Richardson and Pisani, 2012). Since legislation in the mid-1990s developers have switched to more formal sales (warranty deeds), but the lack of formal financing means that colonias residents who want to sell their properties today invariably do so through seller-financing of recorded and unrecorded CfDs (Ward et al., 2012). Following the popularity and widespread use of micro-lending in the developing world, the State of Texas, and certain non-profit organisations such as the CRG, have recently begun promoting the provision of micro-loans to assist with the financing of self-help home improvements. As Giusti and Estevez (2011) illustrate, although such micro-loan programmes are successful in extending credit to colonia homeowners, given their low incomes, even limited borrowing of this sort places certain financial and social burdens on households.

Findings from the ten year snapshot study

The following analysis derives from household surveys in colonias located outside of Rio Grande City, a small border town with fewer than 14,000 residents,⁷ in Starr County, Texas. While Starr County is remarkably poor by US standards, with a median family income of US\$28,779,⁸ colonia residents are often far poorer. As shown in Table 1, 68% of households surveyed earned less than US\$1600 per month (US\$19,200 per year, in 2011 dollars), and 31% earned less than US\$1000 per month (US\$12,000 per year). Of those interviewed, 73% were women and 99% were Hispanic, the majority of whom (83%) were first-generation immigrants (all born in Mexico) but on average had resided in the USA for nearly 30 years. Given that the majority of respondents had grown up in Mexico, it is not particularly surprising to note that educational attainment among those surveyed remains quite low – an average of 6.5 years.

Housing and lot acquisition in the study colonias

In the oversample population studied here, 85% had acquired their original lot or home through an informal CfD, although some later converted to a formal deed prior to the title regularization programme offered by the CRG. The highly irregular land sales by two developers in Starr County meant that buyers paid lower prices than in other colonia subdivisions (Ward et al., 2004), with the average lot costing US\$6905 in 2012 values, at a cost per square foot of just over US\$1 (also in 2012 prices). Most respondents had lived in the colonia for 20 years or more, having purchased on average in 1989 when most were in their late 20s or early 30s and thus in the earlier phase of family building.

Self-help or self-managed housing was the norm across all ten colonias. Most (59%) homeowners whom we surveyed in 2011 reported having built all or a significant portion of their homes through self-help. Those who did not self-build either inherited or purchased the existing dwelling unit, or purchased a used temporary dwelling (such as a trailer or camper) which they moved on the lot, although nearly all homeowners interviewed had made repairs or upgrades to the home. The house-building trajectory often began with a second-hand manufactured home (trailer) or other temporary dwelling, although some built rudimentary shacks at the outset. Thereafter, self-build typically involved cinderblock walls built on a concrete slab or a stick-frame home on brick pylons (as is the case for most manufactured and modular homes).⁹ In 2002 just over one-half (52%) of respondents already lived in what they considered to be a ‘consolidated home’ (usually self-built although other forms of construction were also common): 23% lived in either a camper or a trailer, and 22% lived in mixed-construction homes – a hybrid of two or more dwelling types.

Even for those who live in prefabricated and manufactured housing the process of self-management is the rule (buying the lot and the home, moving it on-site), and taken together self-help and self-management provide a flexible, relatively affordable route to the ‘American Dream’ of home ownership. It allows homeowners to use their ‘sweat equity’ (i.e. labour) to improve their dwellings when resources and time permit. Our data provide preliminary evidence to support this conclusion: the large majority of households engaged in self-help and DIY improvements, and some 58% of households interviewed in 2011 had at least one member with construction skills. Notable, also, was that these latter households appeared more likely to make *major* home improvements (82% compared with 67%).¹⁰

Table 1. Dwelling size, occupancy statistics and sources of loans for home improvements, survey comparisons 2002–2011.

	2002 (N = 106)	2011 (N = 106)
<i>Household income and demographics</i>		
Income < US\$1600/month ^a	–	68%
Income < US\$1000/month ^a	–	31%
Age of interviewee	–	52.43
Female interviewee	–	73%
Years of schooling	–	6.54
Hispanic	–	99%
Mexican born	–	83%
Years in USA ^b	–	29.25
<i>Dwelling</i>		
Year purchased lot	–	1989
Average no. of bathrooms (full-bath)	1.13	1.35
With 2 or more bathrooms	20%	34%
Number of bedrooms (mean)	2.7	2.97
With 3 or more bedrooms	73%	87%
<i>Occupants</i>		
No. in household (mean)	4.08	3.74
Persons per bedroom (mean)	1.64	1.32
Overcrowding (> 2 persons/bedroom)	17%	7%
<i>Households and lot sharing</i>		
0 = vacant lot	2%	0%
1 household	94%	88%
2 or more households	4%	12%
<i>Lending and collateral</i>		
Acquired a formal loan for home improvement	12%	36%
Average amount borrowed (US\$) ^c	\$22,425	\$21,025
Used title as collateral	6%	14%
Lender (total number of loans)		
CRG	2	12
Bank	7	26
Finance company	0	5
Other	3	4
Total	12	47

Notes:

^a2011 dollars.

^bRefers to those born in Mexico (N = 57).

^cIn 2012 dollars.

The home improvement process

As shown in Figure 1, 72% of respondents reported that they made major home improvements between 2002 and 2011, with 32% of respondents having remodelled one or more rooms, 26% and 25% completing flooring and roofing improvements, and

between 15% and 18% making improvements to the garden or parking area.¹¹ Finally, one in ten respondents reported expanding their existing dwelling or purchasing a new dwelling unit. Barely one-quarter (28%) had made no major home improvements during the ten-year period.

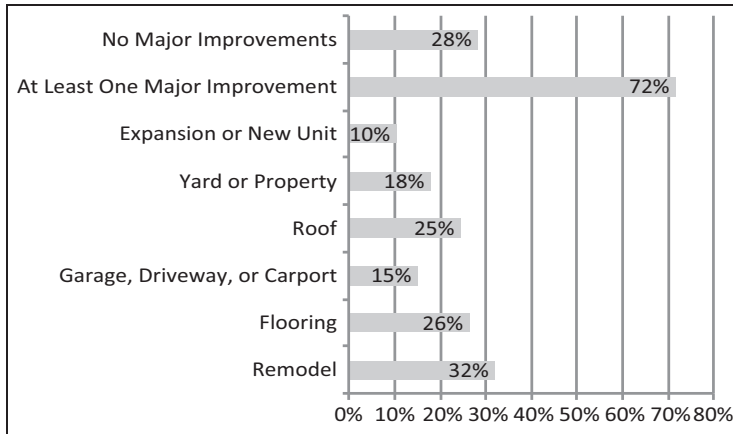


Figure 1. Major home improvements: 2001–2010.

However, among those who had made improvements one observes relatively modest levels of significant dwelling expansion, and a predominance of less extensive improvements such as remodelling, flooring finish-outs, garden or property improvements, etc. Such modest changes are also indicative of the fact that as early as 2002 many homeowners had already completed the majority of large structural improvements to the dwelling. By 2002 the average length of prior residence was 11 years (median = 10), and as our previous study showed there was little difference in housing conditions between those in the CRG-intervened and ‘control group’ survey populations (Ward et al., 2004). Although self-help is invariably a protracted process, most homes were largely built-out by 2001–2002, and while colonias are typically viewed as having extremely poor housing conditions, over time these dwellings have shown significant improvement.

Indeed, a number of the homes we visited in 2011 were quite impressive, solidly built dwellings with significant value. When heads of household were asked what they believed their property was worth, estimates ranged from a high of US\$90,000 to a low of

US\$12,000, with an average of US\$47,190 (median = US\$47,500).¹² We attribute these substantial property values less to rising land values in general – which are unlikely given the stagnant housing and land market in colonias and the fact that infrastructure conditions changed minimally over the ten-year period – and more to the housing consolidation process. As we report elsewhere (Durst et al., 2012), residents’ inflation-adjusted estimates of total property values increased by more than 30%, while estimates of the value of the lot rose by only 3%. These house values suggest that while some residents continue to live in dilapidated or poor-quality homes, overall conditions in these settlements have improved very significantly since the early years of neighbourhood formation, and moderately since the baseline study of 2002 (see Table 1). In 2002 the average number of bedrooms per household was 2.7, suggesting that the majority of homes were quite large a decade ago, when almost three-quarters (73%) had three or more bedrooms per dwelling. Thus it is not surprising that by 2011 the average number of bedrooms per household had risen only slightly (to 2.97), but with 87% of homes now having three or more bedrooms. Similarly, the

average number of bathrooms per household rose modestly from 1.13 to 1.35 across the ten years, although homes with two or more bathrooms rose from 20% in 2002 to 34% in 2011. As early theories about self-help argued, adding or converting space to bedroom use is important as young families grow, and as children reach adolescence it is a priority: thereafter, in Texas, at least, improvements or additional facilities such as bathrooms become more important.

Modest expansion of the home accompanied by changes to the family structure have lowered overcrowding levels. The average household contained 4.08 people in 2002, falling to 3.74 by 2011, while people per bedroom (overcrowding) has declined since 2002 (from 1.64 to 1.32), as did the percentage of homes with more than two people per bedroom (falling from 17% in 2002 to 7% in 2011, Table 1). As we observe below, the decline in family numbers reflects the fact that many owner-households are now in the later stages of the life course and family building, and some are close to retirement age. The average age for heads of household in 2011 was 52 – and many of these owners have children who are now grown-up and have moved out of the family home, often to rent or live with in-laws in the same colonia, or into a separate dwelling on their parent's lot. Indeed, the percentage of lots with two or more households grew from 4% to 12% over the two time periods, and in all cases lot sharing was between close kin relatives.

The correlation analysis presented in Table 2 points toward the probable triggers of home improvement that lie behind many of these changes. Not surprisingly, household income is significantly and positively correlated with spending on home investment on improvements (Pearson Correlation Coefficient = 0.326), household size (0.293), and with changes in the number of household members (0.258); and is negatively associated with owner's age (−0.353) and with

overcrowding in 2002 (−0.196). As is well known, household incomes often display as a bell-shaped curve, being lower at the outset and again in later life, and highest in the middle years of employment when workers are most actively employed, and when many households comprise two or more workers (spouse and adult children). The linkage between stage in the life course, aging and overcrowding is clearly apparent in the significant correlations of the age of head of household variable, which correlates with length of residence (0.199), the size of the household by 2011 (−0.501), and the change in the size of the household between 2002 and 2011 (−0.321). It appears, also, that some older owners have even begun downsizing the number of bedrooms (−0.209), and converting the space to alternative uses.

While the impact of higher household income upon home improvement is not surprising, the findings for household size and age (a proxy for stage in the life course) shed light upon our understanding of the self-help housing process. The fact that household income (in 2011) was positively correlated with number of people (0.293), yet negatively associated with overcrowding in 2002 (−0.227) can perhaps best be explained by the fact that less poor households had, by 2002 already *completed* the 'building-out' stage – especially the expansion of bedrooms to accommodate family growth. However, for the period 2002–2011, those who were not quite so old and who could afford it were still adding family members to the household (0.258), and were more likely to make improvements and to be adding bedrooms (= 0.208).¹³ Exploring the intricacies of how and why households prioritise home improvements or alterations to the dwelling is beyond the scope of this paper. However, in order to better understand the intersection between the housing consolidation process and the life course we conducted intensive case studies with several households, and

Table 2. Correlation matrix for household and colonia improvements 2002–2011.

	Pearson Correlation	\$ spent on home improvements in the last 10 years?	Number of bedrooms 2002	Estimated (monthly) income of household	Years in residence in 2011	No. people per bedroom in 2002	No. people living in household in 2011	No. people living in household in 2002	Change in no. of bedrooms over 10 years	Change in no. of people in the household over 10 years	Age of head of household (2011)
\$ spent on home improvements in the last 10 years?	1										
Number of bedrooms 2002	Sig. level (2-tailed) N	66 -0.285*	1								
Estimated (monthly) income of household	Pearson Correlation Sig. level (2-tailed) N	0.020 66 0.326*	106	1							
Years in residence in 2011	Sig. level (2-tailed) N	0.017 49 0.893	78	78	1						
No. people per bedroom in 2002	Pearson Correlation Sig. level (2-tailed) N	0.007 63 0.958	106	78	106	1					
No. people living in household in 2011	Pearson Correlation Sig. level (2-tailed) N	0.109 66 0.383	103	76	103	0.203*	1				
No. people living in household in 2002	Pearson Correlation Sig. level (2-tailed) N	-0.191 66 0.124	106	78	106	0.040	106	0.238*			
Change in no. of bedrooms over 10 years	Pearson Correlation Sig. level (2-tailed) N	0.263* 66 0.033	106	78	106	0.000	106	0.392**	1		
Change in no. of people in the household over 10 years	Pearson Correlation Sig. level (2-tailed) N	0.225 66 0.069	106	78	106	-0.298**	106	0.657**	106	0.275**	1
Age of head of household (2011)	Pearson Correlation Sig. level (2-tailed) N	-0.122 64 0.338	106	78	106	0.002	106	0.000	106	0.004	106
			0.010	-0.353**	0.199*	-0.115	-0.501**	-0.138	-0.209*	-0.321**	1
			0.922	0.002	0.044	0.255	0.000	0.166	0.034	0.001	103
			103	76	103	100	103	103	103	103	103

Notes:

Significant correlation coefficients in bold.

* $p = 0.05$. ** $p = 0.01$. Values in italics are between 0.05 and 0.1.

these case studies are discussed elsewhere (Ward and Durst, unpublished data, 2013).

Methods of financing home improvement

Because colonia homeowners have very low incomes, home improvement financing typically occurs incrementally and informally. And yet despite such low incomes, those households that completed major home improvements spent on average US\$8755¹⁴ during the previous ten years – a significant sum for families living in such high relative poverty, particularly given that the study time period spans one of the worst recessions in recent memory. Although the housing crisis did not pose as great a threat of foreclosure as it did for many middle-class families who found themselves underwater and unable to make mortgage payments in 2009, respondents reported that the recession did have a significant (43%) or severe (6%) impact upon their ability to make additional home improvements, and only one-quarter said they were not adversely affected. The irony here is that colonia homeowners with little or no access to formal lending markets were less exposed to the financial crisis: a paradox of poverty and informality.

Most owners have used informal and incremental financing mechanisms to pay for home improvements; of those interviewed in 2011 who had made major improvements over the previous decade, 39% used savings or income; 23% acquired a formal loan; 12% ($N = 9$) used income tax rebates; 8% ($N = 6$) received free assistance from a non-profit or government programme; and three households received a loan from family or friends, while 15% used a combination of methods to pay for the home improvements.

Despite the relatively low use of loans for home improvements, more residents did appear to be turning to formal lending sources in 2011 (36%, or 37 in total) than a

decade earlier (12%, Table 1). This increase in formal borrowing is largely due to the growing availability of lending by banks, non-profits, and finance shops.¹⁵ In total, only seven of the loans acquired by 2002 were from a bank, while this had risen to 26 by 2011. Lending from less traditional sources had also grown, and micro-lending offered by the CRG had increased from two to twelve loans. Similarly, although no respondents reported having borrowed from a finance shop in 2002, five had done so by 2011. This apparent increased use of formal credit (especially from a bank) is interesting in that it runs counter to several of our earlier conclusions from the 2002 survey (Ward et al., 2003) and from focus groups conducted at that time (Ward et al., 2011), all of which suggested that low-income homeowners were extremely reluctant to seek formal bank lending. While financial support from local housing agencies such as CRG and from other NGOs is not surprising, turning to formal banks may represent a new trend.

Nevertheless, despite the increased use of loans for home improvement, a number of factors point toward the fact that homeowners' access to or willingness to use formal lending remains limited. For example, although more homeowners have turned to formal lending sources to finance home improvements, the total amount borrowed does not appear to have grown. Adjusted for inflation, the average value of loans acquired prior to 2002 totalled US\$22,425 (in 2012 values), while by 2011 this had fallen to US\$21,025 (also in 2012 dollars).¹⁶ This is partially due to the fact that more households have sought micro-loans provided by the CRG (or by finance shops), since these loans are typically between US\$2000 and US\$4000. Nevertheless, as research by Giusti and Estevez (2011) suggests, even the smaller loans provided by the CRG can impose significant financial

burdens on households, and may be insufficient to allow homeowners to complete home improvements in a timely fashion – in certain instances, the authors report that participants acquired micro-loans in order to purchase materials but were unable to complete the planned home improvements until having acquired a second loan from the CRG.

Other factors suggest that collateralised lending, the primary form of borrowing for middle- and upper-income homeowners, has limited potential in colonias. Although the proportion of collateralised loans (using the title) increased substantially, from 6% ($N = 6$) in 2002 to 14% (15) in 2011, despite more than doubling the actual numbers remained low. These data support earlier conclusions (Ward et al., 2004) that while access to credit markets has expanded in recent years, title regularization is not, of itself, sufficient to push significant numbers of very low-income homeowners into formal credit markets using the home as an asset as De Soto (2000) and others have argued. More robust multivariate analysis is needed to draw more definitive conclusions regarding the impact of title on borrowing and home improvement practices. Suffice to say, as we mentioned earlier, a variety of factors limit the formal financing options available to colonia homeowners regardless of whether the owner possesses clear title. Indeed, as our survey results suggest, most homeowners' remain reluctant to use their property title as collateral: even though almost everyone (95%) interviewed in 2011 was aware that they could use their property title as collateral, only one-half stated that they might be willing to do so. Almost all considered that collateralised lending presented a 'very high risk' (67%) or 'high risk' (18%). This is particularly true given that those who had used their title as collateral tended to borrow larger sums: 81% of those who collateralised the home borrowed US\$15,000 or more,

compared with only 22% who did not use the title to back the loan. Thus, although using title as collateral leverages larger loans, our evidence suggests that most owners are savvy about the risks involved, and that most self-help home construction and improvement takes place informally with low levels of formal bank lending.

Current conditions and continuing needs

As the preceding discussion of housing conditions and previous home improvements demonstrate, many colonia homes are now of significant size, present fewer health or safety risks than in the past, and have substantial value as an asset. However, these same households, along with many other colonia homes, continue to live in unfinished dwellings, highlighting the gradual and often slow nature of self-help and self-managed housing production and improvement, as well as the continuing high burden and social costs that it places upon families.

More than half (57%) of respondents reported that parts of their dwelling remain unfinished (see Table 3), although these are often only relatively minor 'finishing touches' that do not threaten the integrity of the dwelling structure or the health and safety of its occupants. As Table 3 shows, the most common unfinished element is that of floor rendering, which 23% of households said was still outstanding, often in several rooms (3.25 rooms on average). The need for interior and closet doors, trim and sheetrock were also widely mentioned. At the same time, a number of households reported more serious unfinished elements in several rooms of the home such as the absence of insulation (14% of cases), and electrical wiring (11%). Improvements to plumbing, the installation of windows and the repair or addition of roofing were mentioned less frequently and involved a smaller number of rooms, but are also indicative of more

Table 3. Households reporting structural features or improvements lacking or remaining unfinished in 2011.

(N = 106)	Number of households	Households (%)	No. of rooms affected per household (mean)
Sheetrock	14	13	2.14
Doors	20	19	2.40
Trim/baseboards	15	14	3.80
Electrical wiring	12	11	3.67
Plumbing	6	6	1.33
Flooring	24	23	3.25
Insulation	15	14	3.00
Windows	6	6	2.50
Fixtures/storage	11	10	1.64
Roofing	6	6	1.33
Any unfinished dwelling component	61	57	–

problematic housing needs and living conditions.

Few colonia households appear to be actively embracing affordable ‘green’ or sustainable housing applications as part of the self-help improvement process, such as radiant barriers in the roof or on windows, improved insulation and weatherisation, sink and toilet water-saving devices, passive solar water heating, energy-efficient appliances, recycling and composting, shading and exterior microclimate modifications, etc. (Sullivan and Ward, 2012). Because this is likely to be important in the future, and because energy and utility costs savings represent a significantly high proportion of income and household budgets among the poor, our survey asked about the extent of homeowners’ familiarity with, and use of, ‘green’ home applications. Over 40% claimed to have never heard of ‘green’ or sustainable home improvements, and among those that had, it was mostly the installation of energy-efficient light bulbs and adding insulation. In fact our fieldwork observations suggest many households informally cover the interior of windows with aluminium foil on south- and west-facing windows to reflect the sun’s heat, but this was usually undertaken for pragmatic reasons

rather than for the explicit purpose of adopting a sustainable or ‘green’ housing practice.

So what is the bottom line? Our findings show that many colonia residents continue to live in unfinished and, in some cases, potentially unsafe housing conditions, and have often done so for a decade or more. But the data also show that over a 20–30 year period, the home improvement needs of residents have shifted from larger house construction projects to targeted repairs and improvements that accommodate the changing needs of household members. This latter point is also highlighted by a rise from one-quarter to one-half of households reporting a disabled household member during the period 2002–2011, such that 28% of respondents stated that an improvement was needed for a disabled resident, two-thirds of whom specified the need for a handicap-accessible bathroom, principally for an elderly resident.

Conclusion and broad policy implications

Drawing upon survey data ten years apart across several colonias in Rio Grande City, Texas, this paper demonstrates significant

continuing in situ home improvement and investment by owners, most of whom have lived on-site for 20 years or more. Such patterns of upgrading and dwelling consolidation are hardly new in the context of Latin American irregular settlements and today underpin many supportive housing policies. In Texas and the USA, however, while several major studies have analysed colonia and informal subdivisions from various perspectives, this is the first study to systematically document the levels, nature and financing of home improvements over a ten year period. Working from a baseline of 106 homes that were already largely completed by 2002, we have shown that the majority of families have continued to improve their homes through self-help, investing considerable amounts given their low incomes. Most of these housing improvements comprise 'finishing-out' activities paid out of savings and sometimes supported by small loans from NGOs. Relatively few people take out bank loans, and even fewer use their property titles as collateral. Not all self-help building is successful, of course, and our findings also highlight the uncertain, lengthy and intermittent nature of self-help home improvement, and the burdens and risks these present for colonia families. But once a foothold dwelling is established, the general trend is one of gradual home consolidation, with the trajectory flattening out in late middle age.

Policy-making in the past has focused on the earlier stages of colonia formation and development – ensuring clean title, installing basic services, providing some building support programmes, much of it through NGOs. In the future it will also become increasingly important to cater for housing deterioration and decline in some cases, especially where the elderly have become residual 'empty nesters'. The growing prevalence of household members with disabilities and impaired mobility will create a substantial need for disability-related home

improvements on behalf of elderly homeowners. Indeed, the viability of self-help programmes is threatened when caring for elderly or disabled homeowners, since they are less able to undertake self-help projects without outside assistance. Similarly, future policies will need to consider broader issues of housing and neighbourhood sustainability, and help to ensure that colonia homeowners have the resources and know-how to undertake improvements to the home that will also contribute to energy and cost savings.

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Notes

1. Although we collected data on infrastructure conditions and utility services in the colonias studied, the design of the survey prevented us from distinguishing between non-responses and cases in which the respondent lacked a particular service. We thus cannot report on the precise status of infrastructure, although it was our impression that all or most respondents possessed basic water, wastewater and electricity service. This is due primarily to the fact that in the mid-1990s, residents in some of the study colonias (Las Lomas and Colonia B&E) mobilised to garner legislative support for infrastructure improvements (see Arizmendi et al., 2010).
2. Because of the fraudulent or highly informal sales by two principal developers a significant number of residents lacked legal title to their property (Ward et al., 2004).
3. See Dunning (2012). It is a natural experiment in so far as the possession of clear title was due primarily to factors outside the owners' control (developer titling practices,

- potential conflicts because of competing claims of ownership, and errors on the title; see Ward et al., 2003, for more on this). Moreover, the sample populations were similar except for the fact that some had received the intervention while the others had not.
4. Participants were provided with a US\$15 HEB voucher to compensate them for their time.
 5. This research and study 'Housing Sustainability, Self-help and Upgrading in Texas Colonias: A Longitudinal Perspective – 2002 plus 10' was funded in 2010-12 through a grant from the Metropolitan Opportunity Program at the Ford Foundation, NY. It also forms part of a series of studies about low-income colonias and informal subdivisions in Texas, the reports and datasets of which are available at www.lahn.utexas.org ('Texas Housing Studies').
 6. For an overview of the way in which self-help ideas have evolved over time see Ward (2012).
 7. According to 2010 Summary File 1 data provided by the US Census Bureau, the population of Rio Grande City in 2010 was 13,834.
 8. Compared with a median family income of US\$60,004 for Texas as a whole. Data were drawn from ACS 2009–2011 three-year estimates.
 9. Cinderblock construction has the advantage that it can be self-built gradually as resources permit by one or two people and can be left exposed to the elements for extended periods of time. Stick-frame homes require more concerted labour up-front and a quicker time schedule to completion to protect the wood from excessive exposure to the elements.
 10. This was a statistically significant difference at the 0.1 level (Chi-square statistic of 0.083).
 11. Almost all families have at least one vehicle since usually there is no public transport to such outlying settlements.
 12. These values and ranges are broadly consistent with the property appraisal values. The average estimate for the value of the lot by itself (i.e. with no improvement) was just under US\$12,000.
 13. This is significant at the 0.1 level (2-tailed significance of 0.068).
 14. The 'trimmed mean' was US\$7590. These estimates include households that received free assistance from non-profit and government programme and thus reflect household expenditures on home improvements and not the total value of all improvements completed. However, no significant difference in spending was apparent when those households that received free assistance were excluded from the analysis.
 15. However, our intensive case studies indicated that loans were not always used for home improvement or construction but were diverted to meet other essential needs.
 16. It is important to note that neither survey collected data on the precise value and year of each loan. Four cases were excluded because we were unable to identify the value of each loan and the year it was issued, and could therefore not adjust the estimate for inflation.

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