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Contested incrementalism: Elemental's Quinta Monroy settlement fifteen years on

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Quinta Monroy is an award-winning co-designed settlement for ninety-three families on half a hectare of land at Iquique in northern Chile. Neighbours' complaints about the disorderly settlement peaked after the landowner's death and provoked untenured residents to seek government subsidies to redevelop the settlement. From 2003 a government social housing project was coordinated by the 'Elemental' architecture firm with US\$10,000 per household. With the resident's temporary relocated, a series of ninety-three modular and interlinked apartments were built around a series of courtyards. Designed as 'half-houses' they were subsequently co-opted by residents adding rooms in locations planned in advance by Elemental. Many households have since doubled the size of their apartment and reformed the settlement in ways not anticipated by Elemental.

This paper details a spatial and ethnographic study of the Quinta Monroy settlement since redevelopment to identify opportunities and risks that accompany this type of social housing model. It reveals evidence that residents' capacities to enlarge apartments commonly exceeds the architect's expectations and that unregulated expansions often compromise the settlement's liveability. This research anticipates further opportunities for expansion in this semi-regulated settlement and investigates possibilities that another contested slum settlement may emerge.

Keywords: social housing; incremental development; co-design; Aravena, Chile

1. Introduction

Describing itself as a 'Do Tank' the Elemental architecture firm was initiated by Alejandro Aravena, Andres Iacobelli and Pablo Allard at Harvard University in 2000 to focus on social housing strategies. Elemental's links with both Harvard University and Pontificia Universidad Catolica de Chile extend into the Chilean Government's Dynamic Social Housing Without Debt (VSDsD) program. Delivered via the Ministry of Housing and Urbanism (MINVU) the

program distributes funds to private developers and NGOs to develop social housing units (MINVU, 2017). Elemental has responded by delivering a series of public lectures, interviews, exhibitions and architectural competitions to drive conversations addressing social housing policy. Aravena's profile, particularly as director of Elemental, was further enhanced after winning the Silver Lion award for Promising Young Architect at the 2008 Venice Architecture Biennale. The award recognised Elemental's reinvention of the Quinta Monroy settlement and raised the firm's standing to such an extent that, eight years later in 2016, Aravena was awarded both the prestigious Pritzker Prize and the directorship of the Venice Architecture Biennale.

The broader architectural community, particularly the online press, celebrated Aravena and Elemental's success and the Quinta Monroy project captured significant attention (Stohr and Sinclair, 2006). Aravena's 2014 TEDGlobal presentation, viewed more than 2 million times, highlighted Elemental's approach and showcased their subsequent social housing project at Villa Verde (2009). Commercial buildings, including the research laboratory at the Catholic University in Santiago (2014), have brought further acclaim. The production of Elemental's self-titled book in 2016 positioned the team as leaders in the participatory housing space.

Elemental had strong credentials when appointed by MINVU to redevelop the Quinta Monroy settlement. From 2003 Elemental's design competitions had encouraged transparent economic modelling targeted towards satisfying requirements set by MINVU. Once appointed, Elemental hosted a series of community-based public meetings at Quinta Monroy to demonstrate its capacity to collaborate and co-design with the community. They reported that households were keen to play a continued role in the decision-making process and were prepared to share responsibility for the redevelopment (Aravena and Iacobelli, 2016). A key issue of community concern was the desire to avoid permanent relocation to cheaper land on

the city outskirts with Elemental reporting that residents expressed an overwhelming desire to stay within their existing neighbourhood to maintain social and economic networks.

This posed an immediate problem as subsidies offered by the VSDsD program were capped at US\$10,000 per household. This typically equated to 30m² apartments in developments on low-cost sites at the city fringes (Aravena et al., 2004). However, Quinta Monroy's premium location forced Elemental to allocate a higher proportion, US\$2,500 per household, towards land acquisition with apartment construction costs then set at US\$7,500 each. Using figures from the established housing market Elemental calculated that this would provide apartments up to 25m² which immediately conflicted with the residents' complaints of overcrowding in households averaging 30m² (Aravena and Iacobelli, 2016).

Faced with this choice Elemental began investigating the viability of providing partially completed apartments that allowed for future expansion by residents (Aravena and Iacobelli, 2016). In what could be described as a melding of both Modernist and Self-build ideologies, Elemental's approach was to harness the informal productive capacity of the residents after the delivery of a formal and industrialised framework. Aravena explained his architectural philosophy at his TEDGlobal presentation, 'you provide the frame and from then on families take over' (2014).

Quinta Monroy, Elemental's first social housing project, was one of various innovative and experimental housing projects for the poor emerging within the Dynamic Social Housing Without Debt (VSDsD) and the 'Chile Barrio' (Chilean Neighbourhood) programs. In the following years Elemental's approach has been adapted to at least twelve housing projects including 2,045 houses in Chile and Mexico with Elemental's vision influencing discussions around social and participative housing for both the poor in Latin America and the wider world (Negro, 2016). Elemental's concepts have also influenced academia and the education of professionals addressing urban and housing studies in emerging economies (O'Brien et al.,

2020). However, the commentary surrounding Elemental's housing projects has rarely been critically analysed, nor has there been adequate investigation of the longer-term impacts of resident-driven incremental housing growth. This gap in the knowledge is particularly concerning given that Ferguson and Smets (2010) estimate that 50% to 80% of the people in developing countries build their homes incrementally. Therefore, this study is motivated by the need to critically observe residents' approaches for building incrementally within a framework designed to encourage housing growth.

2. Precedent

Elemental's timing was astute as Chilean housing policies were under review following reports of abandoned and deterioration of government subsidized housing units, low levels of resident's satisfaction with the houses provided and evidence that many household's preferred self-managed informal settlements (del Pero, 2016; Morales M. et al., 2017; Muñoz, 2007; Rodríguez and Sugranyes, 2005). During review, MINVU reappraised its public housing project at the Andalucía community in the Chilean capital, Santiago. Inserted into the city center, this award-winning settlement contrasted with the dominant typology that relocated low-income households to the city periphery. A total 180 apartments were constructed, each with a footprint of 30m², within a volume that could be vertically subdivided into two or three levels and incrementally expanded up to 70m² at the residents' own effort and expense (Greene and Rojas, 2010). Over twenty-five years the residents have consolidated their housing asset with a range of self-managed incremental improvements (Greene, 2017).

This precedent is just one of a great number that laid the groundwork for the subsequent redevelopment of Quinta Monroy. Foundations for iterative and dynamic housing processes have been supported by a significant number of theorists and practitioners. The ideologies driving this project at Quinta Monroy should be viewed through a lens that references the works of theorists such as; Turner, Fichter, Habraken, Hamdi, Land, Doshi, Hertzberger, Le

Corbusier, Fathy and Alexander amongst many others. Projects such as PREVI (Peru), Mexacali (Mexico), Aranya (India) and even the unbuilt Plan Obus (Algeria) provide valuable precedent to view the role architects play in fostering dynamic and unique social housing outcomes.

3. Published critique

Generally speaking, the architectural press praised the redevelopment of Quinta Monroy with many highlighting its innovation and use of incremental processes (Groundwater, 2015; Nuijsink, 2008) and others addressing the complexities emerging as the settlement matured (Perez de Arce and de Ferrari, 2008). As a departure from the positive narrative Boano and Vergara-Perucich (2016) critiqued Elemental's approach on ethical grounds claiming the strategy provoked inadequate social and spatial outcomes. Linking Aravena's 'neo-liberal' approach with that of Le Corbusier they questioned the use of social housing as a way to reproduce the capitalist landscape while simultaneously aestheticizing poverty and marginalizing residents (Boano and Vergara-Perucich, 2016).

Hernández examined Elemental's portfolio through the lens of Homi K. Bhabha's post-structuralist theory describing Elemental's 'performative and kinetic' underpinnings. This research claimed that the authority of the architect was disturbed as buildings were 're-signified' by residents (Hernández, 2010, p. 127). The individual apartments, *'... are an outlet for the expression of cultural difference, a space where diverse sociocultural groups can perform their differences and negotiate them with other dwellers on a continuous basis – not always harmoniously'* (Hernández, 2010, p. 126). While Hernández provides little discussion on the physical condition of the settlement, he warned that the lack of specific governance measures controlling self-managed incremental development might prohibit 'harmonious' outcomes.

Ballesteros (2010) noted the historical precedents of the Quinta Monroy settlement and outlined a case linking Quinta Monroy with both the highly regarded PREVI housing project developed in Peru from the late 1960s and Le Corbusier's housing project at Pessac from the mid 1920s. In both cases the residents undertook significant modifications, reconfiguring the formal housing framework and initiating additional layers of building. Elemental's design team had acknowledged that the PREVI development offered a powerful precedent for Quinta Monroy (Aravena and Iacobelli, 2016) but did not mention Le Corbusier as an influence despite similarities with his unbuilt social housing project in Algeria. Known as Plan Obus, Le Corbusier promoted a design strategy that required residents to complete their own apartments within a massive porous concrete and steel framework. Identifying both the self-help and industrialised paradigms as partial antecedents for Elemental's choreographed design strategy allowed Ballesteros to make the claim that Elemental avoided strict ideologies with a pragmatic approach that *'mitigates dichotomies: control vs license, profit vs social responsibility, expense vs investment, formal vs informal'* with a discourse *'as porous as their houses'* (Ballesteros, 2010, p. 88).

Lizarralde (2015) offered a brief critique of Quinta Monroy as part of a larger research project investigating low-cost housing in developing countries. Using this settlement as one of many case-studies, Lizarralde praised Elemental's strategy to allow the apartment beneficiaries the freedom to upgrade and enlarge their core housing unit claiming that, *'(Elemental's) work has demonstrated that lower-standard housing can be upgraded by individual households in post-construction interventions without compromising urban and architectural quality, thus preserving collective value'* (Lizarralde, 2015, p. 196). The undated photographs accompanying this text reveal some of the modifications made by residents but fail to provide evidence that the settlement's

urban or architectural quality remained uncompromised by this activity. Photographs reveal evidence of informal structures in one of the courtyards, however the text provides no discussion or critique of the possible longer-term effects that this activity might have upon the quality of the space.

Suggestions that the Quinta Monroy settlement has not had its urban and architectural qualities compromised, as Lizarralde suggests, needs to be questioned after considering Millones' findings (2017). After undertaking an ethnographic review of the settlement in 2015 she spoke of the disconnect between the project's original conception and the physical outcomes noted during fieldwork. Although reviewing only two apartments she concluded that a financially driven rational approach appeared to have over-ridden the social context with the project's conception compromising the physical environment and leading towards the 'progressive deterioration' of the settlement (Millones, 2017). While this particular study is not sufficiently comprehensive to draw any detailed conclusions about the current state of the settlement, it does legitimise concerns about Quinta Monroy's physical deterioration over the longer-term and raise doubts over Lizarralde's claims that the settlement's condition has not been compromised.

Taken as a whole, this published research provides contradictory narratives around the possible outcomes emerging from the Quinta Monroy redevelopment over the longer-term. The limits to our understanding of the settlement's condition in the fifteen years since occupation is concerning when we consider that the redevelopment has been consistently promoted as a significant model for future social housing programs and forms a large role defining Elemental's many subsequent projects.

4. Research design

This research analyses the incremental construction process of the Quinta Monroy houses led by their residents. The focus are the types of resident-built housing extensions in contrast with Elemental's design and expectations. It does this by recording the situation of the settlement twelve years after the houses were turned over to the residents. This research is based on a mixed research methodology combining questionnaires, interviews with residents and unobtrusive observation of the use of the spaces and the recording of changes made in the original Elemental's houses (Yin, 2013; Zeisel, 1984; Groat and Wang, 2013; Sreejesh and Mohapatra, 2013).

4.1 Data collection and participants' selection

The data for this paper was obtained through a fieldwork program undertaken by the authors between July and August 2017. The initial contact with the residents was through a former community leader acting as the liaison between Elemental and the residents participating in the upgrading process between 2003 and 2005. Other interviewees were selected randomly during daily visits to Quinta Monroy. In the first phase these residents responded to a questionnaire, and in a subsequent phase, ten residents agreed to participate in semi-structured interviews.

The research design process used for data collection included a closed quantitative questionnaire, answered by 18 residents, seeking; (a) general household data, (b) previous housing conditions, (c) initial conditions at Quinta Monroy, and (d) current housing conditions. This was followed by qualitative, semi-structured interviews with 10 residents investigating; (a) timelines for incremental additions, (b) difficulties encountered when undertaking incremental improvements, (c) future plans for improvements and (d) changes to the broader neighbourhood.

This fieldwork facilitated a multi-layered data collection system that first involved the production of a series of architectural drawings of the settlement and housing physical conditions. These drawings complimented the photographic surveying and physical trace analysis to identify the spatial and tectonic changes that had occurred in the settlement since it was handed to the residents.

4.2 Data analysis

The architectural drawings were analysed to provide the qualitative and quantitative results used to record the types, locations and degrees of the resident-initiated additions. An analysis of the types of additional construction materials provided an opportunity to reflect on the robustness and consistency of the new development in the twelve years of resident occupation. This data was then cross-referenced with a series of interviews and questionnaires to provide some confirmation of the immediate patterns of change identified by the authors during the fieldwork. While not the focus of this paper, these interviews ensured that the architectural drawings reflected the lived experience of the residents.

Together these research tactics provide a multifaceted toolkit to read the changes underway at Quinta Monroy and investigate the ways Elemental's incremental housing model accommodates the residents' aspirations. Prior to any discussion of the outcomes emerging from the fieldwork data it is imperative to highlight the outcomes that emerge from previous studies investigating the ideologies driving the project as well as physical outcomes.

4.3 Scope and limitations of the study

The mapping of housing extensions was completed through direct observation and the use of aerial photos taken during the field visit. Many of the changes made by residents

were able to be recorded by the authors freely from public spaces within the settlement while others required access within houses. Additional access inside houses created challenges for the authors as the majority of residents were active in the workforce and home duties and were unavailable to participate in this study limiting the number of interviews and questionnaires. Therefore, this study was unable to capture all of the residents' situations to provide a fully comprehensive understanding of housing modifications, patterns of housing extensions and all emerging issues in the process of incremental construction at one of the most iconic of Elemental social housing projects.

5. Quinta Monroy 2000-2017

Generations of Chileans and migrants from Peru and Bolivia coexisted at the 5700m² Quinta Monroy settlement three kilometres southeast of downtown Iquique. The site was privately owned with households paying rent for access to the land and opportunity to develop self-built housing. The owner's death in 2000 terminated this agreement and the Quinta Monroy residents were then deemed to be illegally occupying the land. Threats of eviction galvanised tenants and prompted efforts to secure government funds for formal land acquisition and access to government subsidies to support new housing. Prior to 2000 there were around 100 households at Quinta Monroy with structures predominantly built with construction materials salvaged from the shipping port (Figure 1). The settlement was unsightly, unhealthy and overcrowded with four people typically sharing a 30m² house (Aravena and Iacobelli, 2016). The density compromised the resident's quality of life with most rooms constructed without ventilation or natural light and from materials with low durability (Iacobelli and Aravena, 2008; Aravena and Iacobelli, 2016). Residents lacked formal access to basic services like electricity, water or sanitation, prompting many households to make illegal connections. The settlement was also vulnerable to threats such as fire, twenty houses were destroyed in 1980 (Araya, 2005),

with concerns about crime forcing residents to organise their own self-defence group (La Estrella de Iquique, 2003).

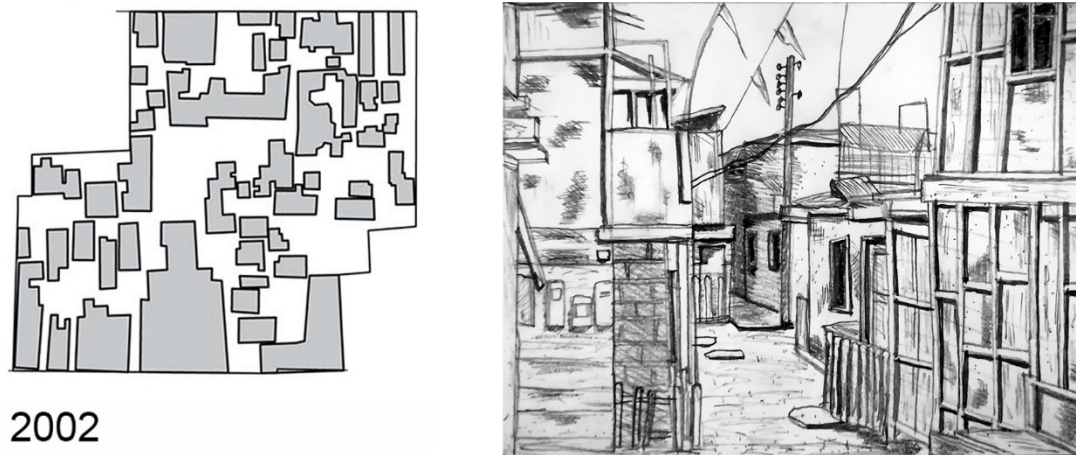


Fig. 1. 'Figure ground' plan and image of Quinta Monroy in 2002 prior to redevelopment.

(source: authors)

Following a direct approach from MINVU's national director, Elemental was appointed the task of redeveloping Quinta Monroy in 2001 with up to one hundred households occupying the settlement by 2005 (Aravena and Iacobelli, 2016). During the design phase Aravena invited Hashim Sarkis, the Aga Kahn professor at Harvard, to review Elemental's progress. At this stage Elemental was concentrating on building individual houses, each on its own lot, and trying to avoid '*...contributing to the same problem that we aimed to solve: the urban mess of the Latin-American city ...*' (Aravena and Iacobelli, 2016, p. 36). With US\$7,500 allowed per house and close to one hundred units required Sarkis encouraged the team to conceive the project as a 'collective building' and asked, '*what is the best building that can be built for US\$750,000?*' (Aravena and Iacobelli, 2016, p. 36). Whilst conducting design studios at both the Catholic University of Chile and Harvard, Elemental had championed the 'Parallel Building' concept with a '*house running parallel with an apartment above*'. (Aravena

and Iacobelli, 2016, p. 37). At Quinta Monroy this model was reconfigured in an arrangement where a single level apartment occupied the ground level with a double-storey apartment above. The final design at Quinta Monroy was somewhat more complicated with 50% more apartments on the upper floor staggered over those below. Dismissing this complexity Aravena downplayed the innovation claiming the model as *‘nothing new... an updated version of the typical two-story house of colonial Latin America’* (Aravena and Iacobelli, 2016, p. 37).

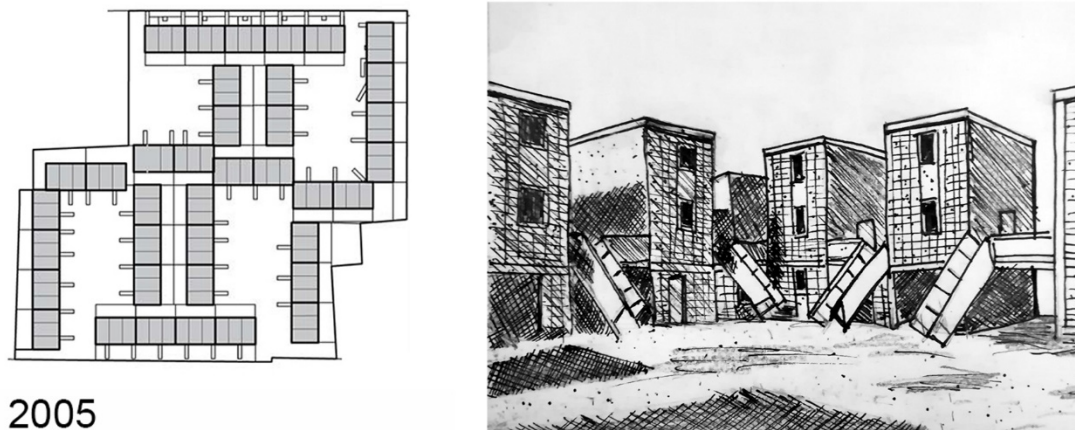


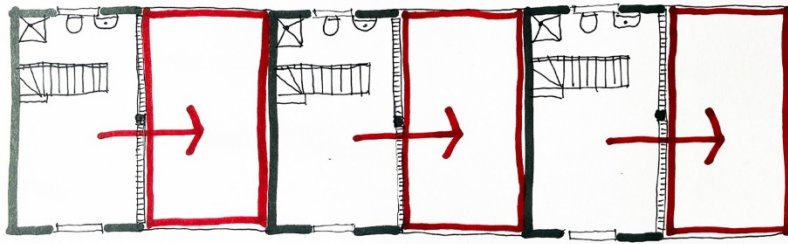
Fig. 2. ‘Figure ground’ plan and image of Quinta Monroy in 2005 at the completion of Elemental’s redevelopment.

(source: authors)

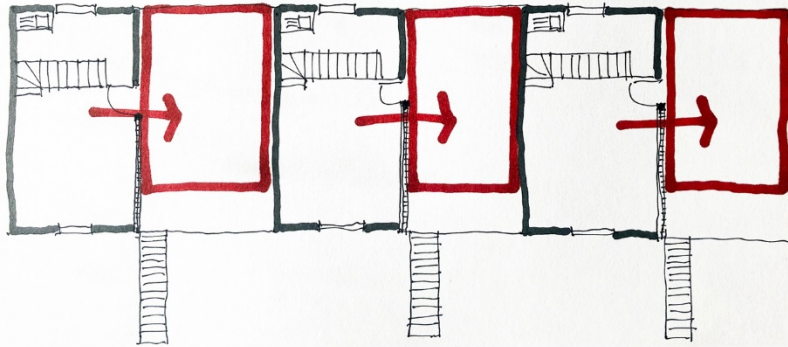
The settlement’s ninety-three apartments were grouped together in thirteen apartment blocks around four courtyards (Figure 2). Two of the blocks, containing a total twenty-seven apartments, have direct street frontage whereas the other sixty-six apartments face the four courtyard spaces. Elemental customised their Parallel Building concept to develop low-rise, repeatable apartment buildings that were ‘porous’ to allow each apartment to be developed in a variety of new ways (Aravena and Iacobelli, 2016, p. 37) and provide a logical framework for the ‘half a house’ strategy. The 36m² single level apartments at ground level were located on an 81m² plot and designed to expand

horizontally to the side and rear yard while the 36m² double-level upper floor apartments were designed to expand at both the first and second floor level with each apartment spaced from each other to allow for extensions between apartments (Aravena and Iacobelli, 2016). During community consultations Elemental made the case that apartments could be enlarged by infilling the ‘porous’ spaces between the completed parts (Figure 3). This was easily achieved for the ground floor apartments where an additional room could be completed with two new walls to increase the apartment from 36m² to 54m². Elemental recognised that doubling the size of the ground floor apartments to 72m² would require an extension enclosing two-thirds of the rear yard, however their site plans detail a smaller room would be built in the yard to maintain adequate light and ventilation into the apartment. This could be interpreted to suggest that the ground floor apartment was best limited to 63m². The upper level had two levels to expand into, one above the other, to double the apartment (from 36 to 72m²). This modification was a more complex task given the need for a new floor, new roof and four new walls across two levels.

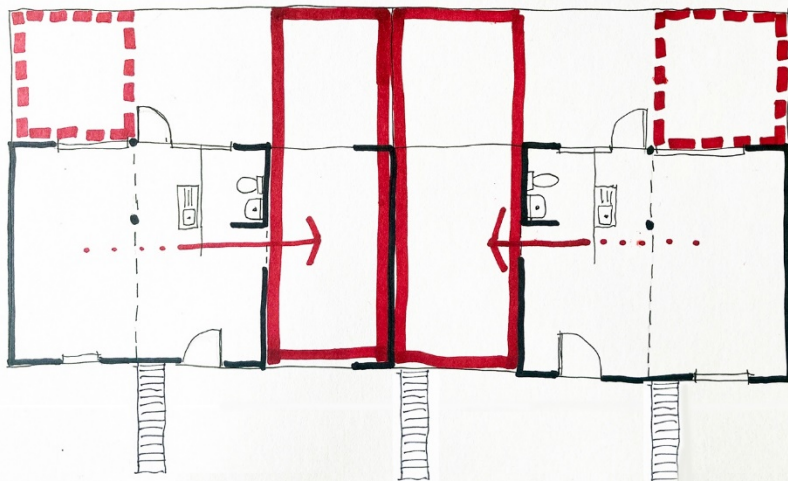
An interview with Aravena revealed that Elemental did not expect residents to expand their apartments beyond 72m² and suggested the right to expand was capped at this point (Nuijsink, 2008). At this size, Aravena claimed, apartments would include four bedrooms, a living room, kitchen and bathroom. Those residents preferring a larger house would be able to sell their apartment at Quinta Monroy and access the private market.



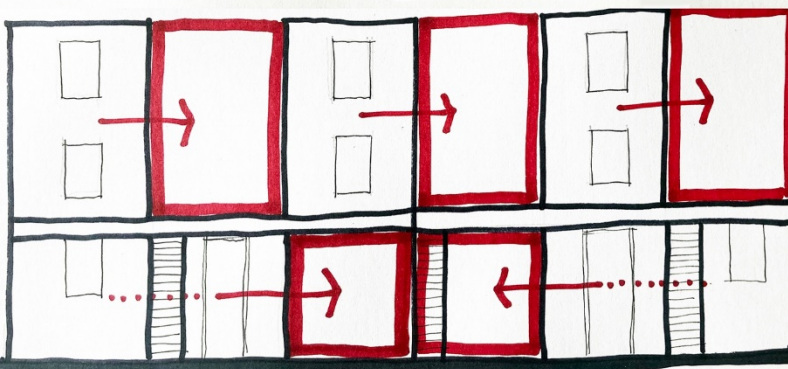
Upper floor plan



Mid floor plan



Ground floor plan



Front elevation

Fig 3. Diagram of initial apartments (black) and proposed additions (red). The two apartments at ground floor and three above were intended to be expanded horizontally. There was also an option to enclose the dashed space.

(source: authors)

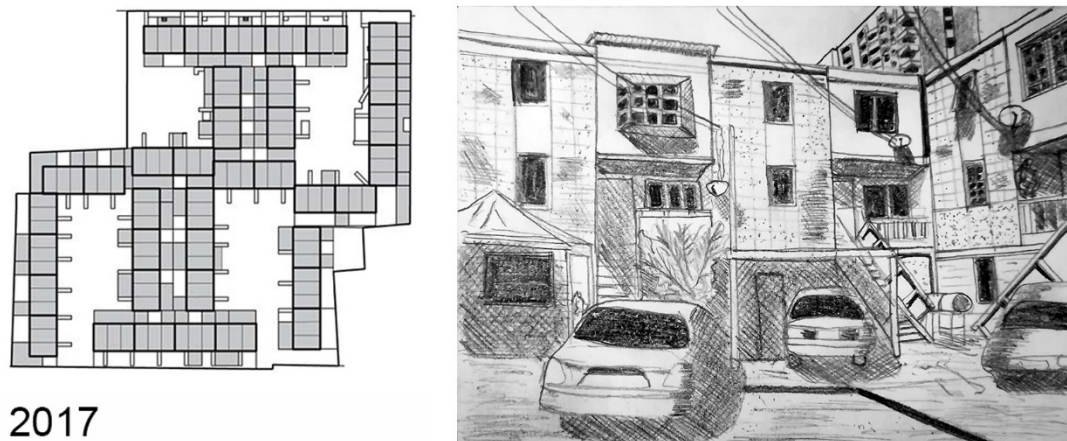


Fig 4. 'Figure ground' plan and image of Quinta Monroy in 2017 with extensions initiated by residents.

(source: authors)

The Quinta Monroy residents commenced modifications once they began occupying the apartments from 2003 (Figure 4). By August 2017 all of the ground level apartments had infilled the space to the side of the apartment and all but one of the upper level apartments had extended sideways into the allocated space. Close to all (96%) of the ground level apartments had extended into their rear yard. These high levels of engagement validate Elemental's ambitions for the residents to extend their houses within the framework indicated. However, what has become clear is that these additions did not stop at this point and a significant range of further work has extended many of the apartments beyond those additions anticipated in Elemental's drawings. Nearly one-third (31%) of the ground level apartments have built additions into public courtyards including a range of structures including living spaces and carports. One-half (49%) of the upper level apartments have cantilevered rooms over either the public areas (predominantly the

courtyards) or over their lower neighbour's rear yard. Four of the upper level apartments had also constructed additional enclosed living areas on the roof of their apartment. Whereas Elemental has envisioned the apartments to double in size the evidence shows that the typical apartment has increased in size by a factor of 230% with some apartments extending to such an extent that the residents were able to divide and sublet part of their home (Figure 5).

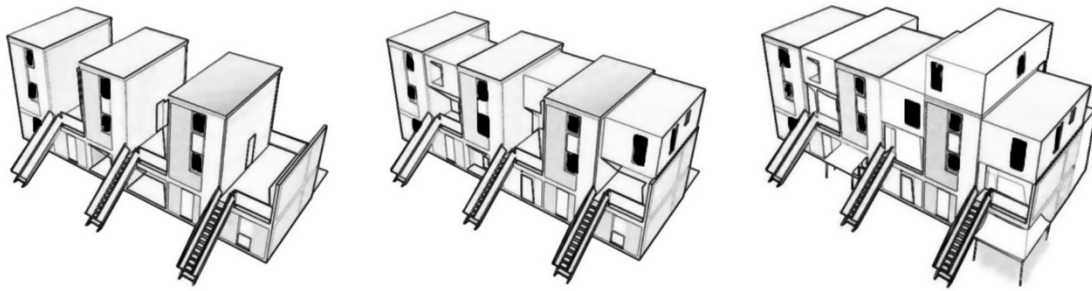


Fig 5. The apartments as built in 2003 (left), with additions suggested by Elemental (middle) and with typical additions in 2017 (right).

(source: authors)

6. Incrementalism: Porsity and solidity

As the density of the settlement increases Ballesteros (2010) has suggested that PREVI, a low-cost housing project in Peru, provides a useful lens with which to begin an analysis of the modifications made at Quinta Monroy. PREVI, built from 1968, has now been modified and extended to such an extent that it is difficult to recognise the original houses as new rooms and decoration over-ride the architect's original architecture with layers of new development (McGuirk, 2011). Evidence shows a similar process is now underway at Quinta Monroy as modifications extend beyond those detailed by Elemental. Now that the straightforward expansions into porous areas has been largely completed the residents are looking to new opportunities for asset capitalisation. Without a regulated upper

development limit there is strong likelihood that, like PREVI, the coming years will see continued and significant new development to the front and rear of the apartments. Households on the upper level have added living spaces on the roof and cantilevered rooms over courtyards and ground floor apartments (Figure 6). Apartments on the ground floor are building permanent and semi-permanent structures into the courtyard space.

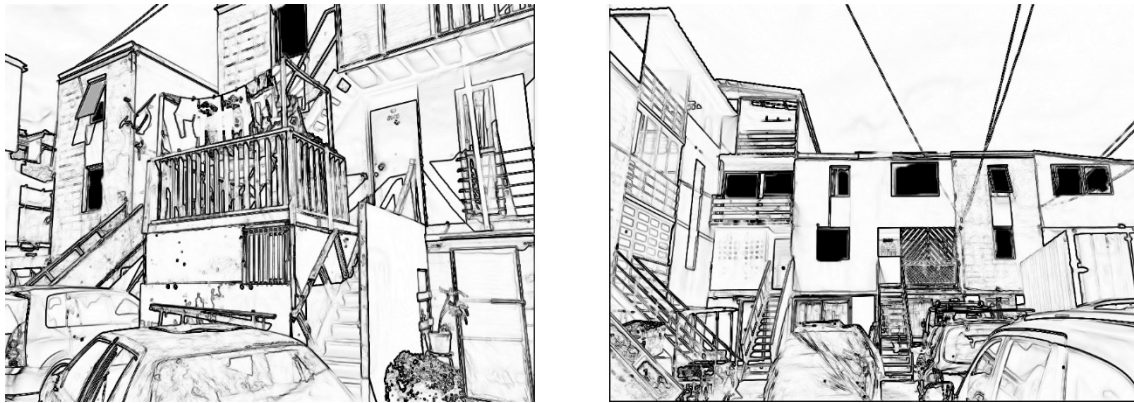


Fig 6. Additions to the front of apartments and onto the roof enable households to expand and, in some cases, create rooms that can be sub-let.

(source: authors)

Any expectations upon the residents to undertake any additions beyond those outlined in Elemental's drawings and commentary were never made explicit by Elemental – there are no documents that suggest that the spatial envelope around the house would be exceeded or additions would encroach onto public space, over neighbours or diminish the liveability of any household. Furthermore, there is no evidence of any regulations or rules being devised to limit development, nor any discussion of governance structures that might oversee future development activities. This freedom has facilitated an abundance of extensions above and beyond those documented in Elemental's drawings and include formal, semi-formal and informal additions at ground floor and upper floor levels (Figure 7).

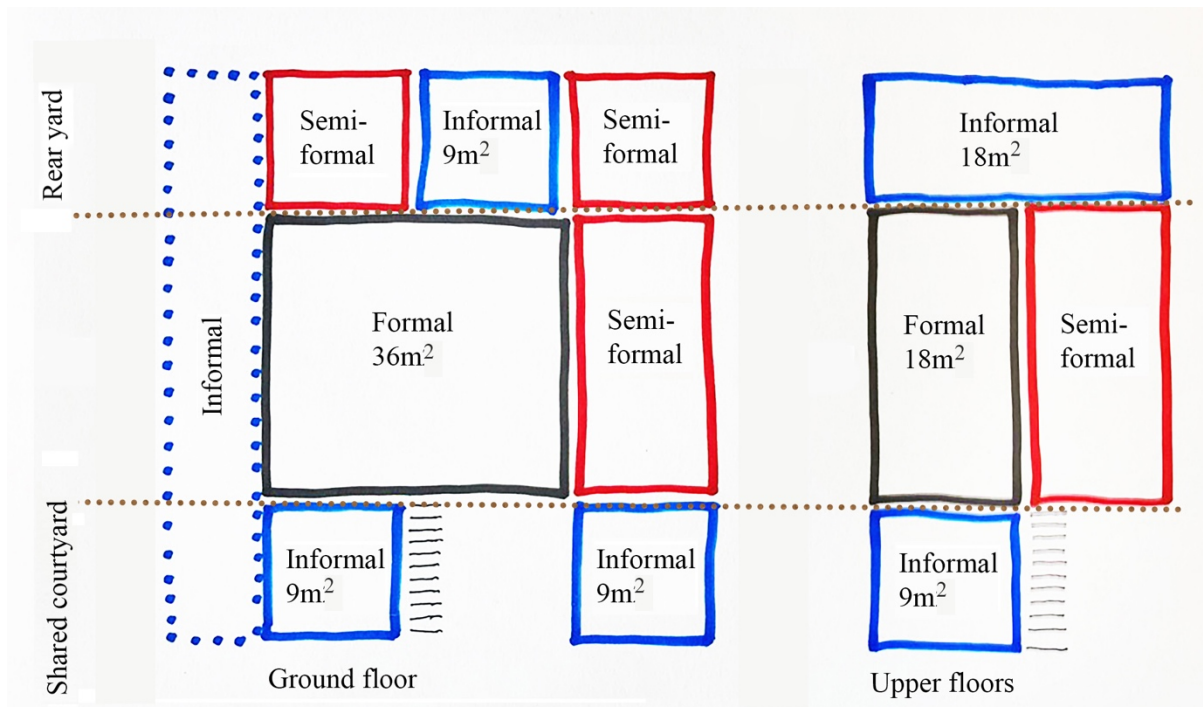


Fig 7. Diagram revealing a selection of possible opportunities for ground and upper floor extensions.

(source: authors)

The spaces outlined in black were completed by Elemental with the anticipation that the areas highlighted in red would accommodate the extensions initiated by residents. The blue areas indicate additional areas that, in many cases, have since been occupied as unauthorised extensions beyond those anticipated by Elemental. The dotted area highlights vacant space adjacent to some apartments that has been further appropriated for additional extensions. The staircase in the courtyard, leading to upper apartments, restricts the scope to develop to the front of the apartments.

Quantifying and locating the additions to apartments provides some indication of the capacity of the Quinta Monroy settlement to keep expanding in this unregulated environment. Mapping the ongoing apartment developments facilitates an understanding of the complexity of additions and requires a framework of analysis to detail the floor

spaces, locations and each household's tenure over space. This process begins with a classification of interior floor space into three types with the third (informal) further divided according to delineate between the occupation of spaces that do, or do not, need to be negotiated with neighbours.

Formal: These spaces were completed during formal construction by contractors under the direction of Elemental with both the ground floor and upper floor apartments designed to 36m² each.

Semi-formal: Elemental designated expansion spaces that required construction to be managed by householders themselves. The ground floor apartments include a further 18m² of framed space plus a rear yard of 27m² that was intended to have either 9 or 18m² for expansion according to Elemental's drawings and written documentation. The upper level apartments could double in size up to 72m².

Informal: Additional encroachments have been constructed by households beyond those intended by Elemental. These occur outside Elemental's designated development zones and can include additions to the front, rear, side and on top of the apartments. In some cases, informal additions require negotiations with neighbours (*negotiated informal*) while others have the potential to compromise living conditions by significantly diminishing light and ventilation such as ground floor apartments where the rear yard is fully enclosed (*slum informal*).

Table 1. Classification of spaces and possible floor areas

	Ground floor m ²	Upper floor m ²
Formal	36	36 (2 floors of 18)
Semi-formal	27 (18 adjacent plus 9 rear yard) or 36 (18 adjacent plus 18 rear yard)	36 adjacent

Informal	18 in courtyard (leaving space for staircase)	18–36 on roof with one additional storey (level 4) or 36–72 on roof with two additional storeys (levels 4/5)
Negotiated informal	0	108 four floors (each with 18m ² over rear yard plus 9m ² over shared courtyard)
Slum informal	9 in rear yard (maximum site coverage)	0
Maximum m ²	99m ²	252m ²
	99m ² x 38 apartments	252m ² x 55 apartments
	3762m ²	13,860m ²

One measure of the degrees to which the floor area of the 38 ground and 55 upper floor apartments can be maximised is detailed in Table 1. This scenario is based on the assumption that apartments are expanded into the courtyard and rear yard (including airspace above) and with two floor levels on top of the existing roof. It allocates 9m² for access at each level to accommodate staircases.

These calculations reveal there are significant further possible areas of encroachment beyond those designated by Elemental. On the ground floor this includes the enclosure of the remaining 9m² of backyard to produce 100% lot coverage and diminish the apartment's natural light and ventilation. Further encroachments into the courtyard spaces are also possible although entry to upper floors must be maintained. If we assume that two of the three bays could be enclosed, leaving one dedicated for staircase access, this would represent a further 18m² producing a total ground floor apartment size of 99m².

Once the upper floor apartment has been extended to fill the gap between neighbouring apartments (72m²), it can be further extended vertically to encompass a fourth floor with an additional 36m² for a total of 108m² without any detrimental impact on light and ventilation. With some negotiation with the ground floor neighbours the upper floor rooms can also be cantilevered above on either the front or rear facades, or,

constructed directly above prior ground floor encroachments. If such additions were added on floors 2, 3 and 4, they would add up to 27m² per floor or a further 81m². If, and perhaps when, the apartment buildings were extended to 5 floors, this would add a further 63m² for a total apartment size of 252m². While there is no guarantee that this scenario will occur, it opens the possibility that the upper floor apartments could be subdivided and sublet to become single floor apartments of up to 60m² each. There is already evidence that a process of subdivision and subleasing has emerged in the settlement as additional external staircases provide access to upper level apartments.

Fifteen years later, and with no formal governance structures in place to oversee development, there is no evidence that the expansions into the courtyards and other publicly contestable space will decline. The precedent of cantilevering new rooms over both public and private space has been established as has the right to construct new rooms on the fourth floor.

At a basic level, it can be argued that Elemental's half-house strategy was clearly a success as an informal settlement, decried as a slum, with approximately 4,500m² of housing was replaced with 3,384m² of formal space designed to double to nearly 6,800m². The analysis in Table 1 outlines a possible scenario indicating ways the settlement could grow to 17,622m², close to four times the settlement's size before redevelopment, without including the additional possible potential for apartments to encroach upon the liminal spaces beside and between apartment blocks.

7. Freedoms and divisions

The freedoms that come with the capacity to extend, modify and enhance one's own housing has been extolled by many theorists over the years – most famously by Turner, (1968; 1976) and in partnership with Fichter (Turner and Fichter, 1972). More recently concerns have been voiced about this approach and the risks posed to the broader

community. Critiquing the ‘freedom-based approach’ Lizarralde voiced concern that the moral individualism leads to the decay of collective values that, in turn, compromises public space (Lizarralde, 2015). How significant is the risk for the Quinta Monroy settlement and residents?

7.1 Compromised amenity

The quality of the living environment in many of the apartments, particularly those on the ground floor, is frequently compromised by the density of the extensions. Initially all ground floor apartments were designed with a window and door opening to the courtyard and another window and door to the rear courtyard to provide access, light and ventilation. The desire to extend apartments has led to many of the ground floor apartment owners fully enclosing the rear yard and relying upon openings in the front facade. Across the settlement; eight of the twenty-nine ground floor apartments located in courtyards have only one-third of their rooms with access to natural light and ventilation. Thirteen ground level apartments have one-third of their rooms without light or ventilation. Apartments towards the middle of the settlement, particularly those in the middle of blocks at ground level, face the most restrictions and capacity to extend with many households facing similar levels of density and loss of amenity identified by Elemental when critiquing the liveability of the previous settlement. These outcomes raise concerns about the liveability of these apartments and the authors’ own experiences that many of these apartments are dim and suffering from poor air quality.

7.2 Access inequality

The authors’ semi-structured interviews with Quinta Monroy residents provide evidence of complicated community relationships as residents negotiate ways to improve their living environment. While not the focus of this paper, these interviews make it clear that

many residents see it as their right to privatise spaces that many others consider to be collectively owned.

The proliferation of extensions is complicated by the occupation of spaces of contested ownership, most noticeably within the courtyards designated by Elemental as collective space. Less clear is the ownership of the many remnant spaces beside the blocks of apartments that were not formally allocated to particular apartments or courtyard spaces. The resident's free appropriation of these liminal spaces to expand their own apartment occurs without any formal mechanism for the allocation of these spaces. Conversations with residents suggest a rising disquiet as public spaces become privatised and the challenges this competition places upon the wider well-being of the Quinta Monroy community is an area that requires further investigation.

7.3 Adverse informality

The majority of the structures located in the courtyards are built with the same low durability materials identified by Elemental when describing the 'slum' conditions encountered before their involvement. Before the reconstruction of Quinta Monroy began in 2003 Elemental's architects described the settlement as 'looking like a slum' with construction materials of low durability, poor structural integrity and developed in such a way that diminished access to sunlight and ventilation (Iacobelli and Aravena, 2008). Davis (2006) warned that informal additions can easily escalate into conditions that are 'slum-like' – a possibility that must be considered when reviewing the most recent developments at Quinta Monroy. Of the 31% of ground floor apartments that have built into the courtyard space more than two-thirds have been constructed with salvaged or lightweight materials as residents endeavour to capitalise upon their freedom to enlarge apartments rather than replicate the industrialised materiality and aesthetic developed by Elemental.

8. Conclusion

The Quinta Monroy settlement represents a major achievement for the Elemental architectural practice gathering significant profession interest and helping its founder win the world's most sought-after architecture prize. Curating and intertwining theories inherent in architectural modernism and self-build, the Quinta Monroy development has responded to fiscal demands and provided housing outcomes satisfactory to low-income households and government agencies. Adulations aside, there are a number of ways where the longer-term outcomes of these considerations at the Quinta Monroy settlement are compromised by Elemental's adaptations of these ideologies and the unregulated processes of incremental additions.

In particular the ground floor apartments are most disadvantaged by ongoing efforts to extend living spaces. Many of these apartments have significant numbers of rooms that have been reduced to a windowless condition and a process of encroaching upon the shared courtyard has begun. This encroachment takes place in an unregulated environment and causes friction between different households competing for limited amounts of space. By contrast the upper level apartments receive a hidden subsidy due to the significantly higher levels of capacity to expand with rooms now being added to create a fourth floor and with cantilevered extensions over rear yards and courtyards. These additions have the potential to progress to a fifth floor, and perhaps upwards again, should the economics prove favourable.

While the pace of the resident-initiated modifications peaked shortly after the apartments were occupied there is significant evidence that incremental additions will continue. This paper highlights a likely future for Quinta Monroy where the continued informal additions create increasingly contested outcomes, where competition between residents over access to space becomes more complex and where developments take place

without any form of governance. While the drivers of this change remain dynamic it will always be difficult to clearly identify how this incrementalism might progress. At the same time there are significant spatial constraints that limit the economic returns when apartments are increased in height and the difficulty in providing staircase access increases. However, it is clear that the potential for the Quinta Monroy settlement to replicate the same living conditions as existed before redevelopment, described as ‘slum-like’, is not to be dismissed as privatisation of public space is accompanied by higher density, lower build quality and ever diminishing amenity.

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References

- Antipova, X., 2010. Consejas de Santiago: Stories from Santiago, Chile. The Social Housing Experience. In Summer 2010, Field Research: Special Interest Group in Urban Settlement- SIGUS. Massachusetts Institute of Technology, School of Architecture and Planning.
- <http://web.mit.edu/incrementalhousing/articlesPhotographs/pdfs/XeniaReportSM.pdf>
- Aravena, A., Montero, A., Cortese, T., De la Cerda, E., and Iacobelli, A. 2004. Quinta Monroy. ARQ (Santiago) (57):30-33.
- Aravena, A., Elemental-Interview. Perspecta 42: 85-89.
- Aravena, A., 2014. ¿Mi filosofía arquitectónica? Incluir a la comunidad en el proceso [My architectural philosophy? Engaging the community in the process]. Last Modified October 6-10, 2014.
- https://www.ted.com/talks/alejandro_aravena_my_architectural_philosophy_bring_the_community_into_the_process?language=es
- Aravena, A., and Iacobelli, A., 2016. Elemental: manual de vivienda incremental y diseño participativo [Elemental: incremental housing and participatory design manual]. Ostfildern: Hatje Cantz.

- Araya, M., 2005. La pionera de la Quinta Monroy [The pioneer of Quinta Monroy]. La Estrella de Iquique, 13 November 2005. Accessed 9 November 2019. https://www.estrellaiquique.cl/prontus4_nots/site/artic/20051113/pags/20051113090809.html
- Ballesteros, M., 2010. Elemental—Lessons in Pragmatism. *Perspecta* 42:83-84.
- Boano, Camillo, and F Vergara Perucich. 2016. "Half-happy architecture." *Viceversa* (4):58-81.
- Davis, M., 2006. Planet of slums. *New Perspectives Quarterly* 23 (2):6-11.
- Greene, M., 2017. Incremental Housing: The Chilean experience. Santiago, Chile: Facultad de Arquitectura, Diseño y Estudios Urbanos Pontificia Universidad Católica de Chile.
- del Pero, A. S., 2016. Housing policy in Chile: A case study on two housing programmes for low-income households.
- Ferguson, B., and Smets, P., 2010. Finance for incremental housing; current status and prospects for expansion. *Habitat International*, 34(3), 288-298.
- Greene, M., and Rojas, E., 2010. Housing for the poor in the city centre: a review of the Chilean experience and a challenge for incremental design. In *Rethinking the informal city: critical perspectives from Latin America*, edited by Felipe Hernandez, Peter Kellett and Lea K. Allen. New York: Berghahn Books.
- Groat, Linda N., and David Wang. 2013. *Architectural research methods*. Hoboken, New Jersey: John Wiley & Sons.
- Grundwater, A., 2015. A case for the incremental: Quinta Monroy. *Architecture AU*, accessed 12 February. <https://architectureau.com/articles/a-case-for-the-incremental-quinta-monroy/>.
- Hernandez, F., 2010. *Bhabha for architects*. London; New York: Routledge.
- Iacobelli, Andrés, and Alejandro Aravena. 2008. Elemental: Housing as an Investment Not a Social Expense. In *Urban transformation*, edited by Ilka Ruby and Andreas Ruby, 244 - 357. Berlin; Zürich: Berlin: Ruby Press; Zürich: Holcim Foundation for Sustainable Construction.
- La Estrella de Iquique, 2003. Fumones intentaron quemar la Quinta Monroy [Addicts tried set fire the Quinta Monroy]. La Estrella de Iquique, 1 October 2003. Accessed 9 November 2019. <https://www.estrellaiquique.cl/site/edic/20031001001255/pags/20031001002406.html>
- Lizarralde, G., 2015. *The invisible houses: rethinking and designing low-cost housing in developing countries*. New York: Routledge.

- McGuirk, J., 2011. PREVI: The Metabolist utopia. Editoriale Domus Spa, accessed 20 June 2020. <https://www.domusweb.it/en/architecture/2011/04/21/previ-the-metabolist-utopia.html>
- Millones S., Y., 2017. La otra mitad de la Quinta Monroy [The Other Half of the Quinta Monroy]. *Revista de Arquitectura* 22 (32):67-72. doi: 10.5354/0719-5427.2017.46147
- MINVU, 2017. Series estadísticas de subsidios, subsidios otorgados 1990 a Julio 2017 [Subsidy statistics series, subsidies granted from 1990 to July 2017]. edited by Ministerio de Vivienda y Urbanismo. Santiago, Chile.
- Morales M., Rodrigo E., Carolina B. Besoain A., Alejandro Soto M., Laís Pinto de Carvalho, Karla D. Hidalgo P., Ismael Fernández P., and Vicente Bernal S., 2017. Retorno al campamento: resistencia y melancolía en los márgenes de la ciudad formal [Return to the slum: Resistance and melancholy in the outskirts of the formal city]. *Revista INVI* 32 (90):51-75. doi: <http://dx.doi.org/10.4067/S0718-83582017000200051>
- Muñoz, C., 2007. Vivienda Progresiva, un programa del sector público que se potenció en el hábitat rural chileno. *Revista INVI*, 22(59). <http://revistainvi.uchile.cl/index.php/INVI/article/view/293/922>
- Negro, V., 2016. Arquitectura Participativa en America Latina [Participatory architecture in Latin America]. *Casa del Tiempo*, 3(32). http://www.uam.mx/difusion/casadeltiempo/32_sep_2016/casa_del_tiempo_eV_num_32_42_45.pdf
- Nuijsink, C., 2008. Less Money, More Creativity. interview with Alejandro Aravena. *Mark Magazine* (15):175-81.
- O'Brien, D., Carrasco, S., and Dovey, K., 2020. Incremental housing: harnessing informality at Villa Verde. *Archnet-IJAR: International Journal of Architectural Research*. <https://doi.org/10.1108/arch-10-2019-0237>
- Perez de Arce, R., and de Ferrari, F., 2008. The Raw and the Cooked: Past, Present, and Future in Quinta Monroy, Iquique, Chile. In *Wohnmodelle: Experiment und Alltag Housing models: experimentation and everyday life*, edited by Oliver Elser, Michael Rieper, Christina Nägele, Christine Schmauszer and Wien Künstlerhaus, 118-121. Vienna: Folio-Verlag.
- Rodríguez, A., and Sugranyes, A., 2004. El problema de vivienda de los con techo [The problem of Those with a roof]. *EURE (Santiago)* 30 (91):53-65. doi: <http://dx.doi.org/10.4067/S0250-71612004009100004>

- Rodríguez, A., and Sugranyes., 2005. Los con techo. Un desafío para la política de vivienda social Santiago de Chile [Those with a roof: A challenge for social-housing policy], Ediciones SUR. Santiago, Chile.
- Salvi del Pero, A., 2016. Housing policy in Chile: A case study on two housing programmes for low-income households. In OECD Social, Employment and Migration Working Papers. Paris.
- Sreejesh, S., and Mohapatra, S., 2013. Mixed method research design: an application in consumer-brand relationships (CBR): Springer Science & Business Media.
- Stohr, K., and Cameron S., 2006. Design like you give a damn: Architectural responses to humanitarian crises. London: Thames & Hudson.
- Turner, J. F. C., and Fichter, R., 1972. Freedom to build: Dweller control of the housing process. New York: Macmillan.
- Turner, J., 1968. The squatter settlement: an architecture that works. Architectural Design 38 (Architecture of Democracy): 355-360.
- Turner, J. F. C., 2017. Housing by people: towards autonomy in building environments. New York: Marion Boyars.
- Yin, R. K., 2013. Case study research: design and methods. Los Angeles: Sage Publications.
- Zeisel, J., 1984. Inquiry by design: tools for environment-behaviour research. Cambridge: Cambridge University Press.