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**'PROTOTYPING RESIDENTIAL SUBDIVISIONS'
EXPERIMENTING WITH MAKING AND PROTOTYPING FOR COLLECTIVE LEARNING
OVER SPATIAL ISSUES.**

In Flanders (Be), suburban neighborhoods and particularly residential subdivisions made of single-family detached houses still represent the most common way of living. Supported by anti-urban policies, economic possibilities and the stimulation of homeownership (De Decker, 2011), the persistent Flemish housing sprawl saw its acceleration after the Second World War with the establishment of the Flemish 'housing dream': a private house with a garden in a quiet suburban setting (Bervoets and Heynen, 2013; De Vos and Heynen, 2015). The focus on a plot-by-plot development and private initiative and life has resulted in the prioritisation of individual dwelling spaces and practices over the collective dimension and context of inhabiting (De Meulder et al. 1999).

Today these environments are confronted with considerable economic, ecological and social challenges. Whereas on an institutional macro-level these challenges are evident and urgent with the development of visions that aim at a more sustainable urbanization (e.g. Spatial Policy Plan for Flanders released in June 2018), on the micro-scale of the neighborhood, these visions have so far failed in having a wide spread impact on the everyday modes of living of the inhabitants.

Starting from the hypothesis that change in residential subdivisions can only be durable if supported by processes of collective learning over spatial issues (Elbakidze et al., 2015), the research aims at developing design related tools and techniques for facilitating residents, local authorities and other local organizations and actors to collectively discuss envision and sustain the transformation of suburban residential areas into more sustainable urban environments. To do this, the research advances participatory design methods and in particular making and collective prototyping (i.e. the making of things in participatory design as an open-ended process between material making and participative decision making, Binder et al. 2013). Through making and collective prototyping the actors of residential subdivisions are facilitated to develop their capabilities (Baser and Morgan, 2008) to formulate and reach collective objectives (e.g. urban sustainability) starting by unveiling, evaluating and reworking everyday modes of dwelling and dwelling spaces. This presentation particularly considers and analyses two case-studies in Flanders, in which making and collective prototyping (e.g. a paper sketch model of an average local house and plot with different paper components, furniture, trees, cars...) have been employed for collective learning over spatial issues to facilitate opportunities and challenges for retrofitting the residential subdivisions to contextually emerge and be discussed and evaluated.

Keywords: residential subdivisions, retrofitting, collective learning, participatory design, prototyping, sustainability

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'Prototyping Residential Subdivisions. Experimenting with making and prototyping for collective learning over spatial issues.'

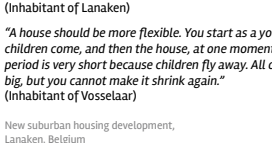
KEYWORDS: Residential Subdivisions; Retrofitting; Collective Learning; Participatory Design; Prototyping; Sustainability.

CONTEXT: Flemish suburban neighbourhoods.
In Flanders (Belgium), suburban neighbourhoods and particularly residential subdivisions made of single-family detached houses still represent the most common way of living. Supported by anti-urban policies, economic possibilities and the stimulation of homeownership (De Decker, 2011) the Flemish housing sprawl saw its acceleration after the Second World War when the increased housing demand was confronted with massive suburbanisation processes (Bervoets and Heynen 2013) with the consequent establishment of the 'Flemish housing dream: a private house with a garden in a quiet suburban setting' (De Vos and Heynen, 2015) "sheltering a urban lifestyle in a semi-rural environment" (Van de Weijer, 2014: 11). The focus on a plot-by plot development and private initiative and life has resulted in the prioritisation of individual dwelling spaces and practices over the collective dimensions and context of inhabiting (De Meulder et al. 1999).

CHALLENGES: Residential Subdivisions in need of transitions.
Today the future feasibility of residential subdivisions and their connected lifestyles to continue exist as they are being questioned in light of demographical and socio-economic developments and of major economic (e.g lack of local economy, high cost of infrastructures, space underuse...) ecological (e.g. lack of green, high energy demand...) and social challenges (e.g. ageing of the population, increasing diversity...). The resistance to change of the single-family detached house on its own plot of land as most common mode of living has been identified as being the entanglement of different reasons, not only the home culture but also the materiality of the house which is perceived to be very difficult to modify and adjust over time. Furthermore, the lack of wide spread and well known examples for alternative housing typologies and practices also contribute to the problem (Bervoets and Heynen, 2013).



Residential subdivision composed of single-family detached houses, Lanaken, Belgium.



"Before moving here, we were living and working in Brussels, but we did not want to buy a house in the city because it was a too urban environment for us, we wanted more nature around us." (Inhabitant of Lanaken)

"A house should be more flexible. You start as a young couple, then the children come, and then the house, at one moment, is even too small. But this period is very short because children fly away. All of a sudden the house is too big, but you cannot make it shrink again." (Inhabitant of Vosselaar)

New suburban housing development, Lanaken, Belgium

AIMS: Building spatial capacities for more sustainable retrofitting alternatives.
Today, whereas on a macro-level the challenges to achieve a more sustainable urbanisation are becoming more evident and urgent with plans that aim at a more resilient, compact and dense urbanisation, the so far implemented urban visions and plans have failed in having a wide spread impact on the everyday mode of living of the Flemish inhabitants. Experimenting with processes that facilitate residents, local authorities and other local organisations to learn from each other and to develop their capacities to define and achieve collective objectives over spatial issues (Elbakidze et al., 2015; Baser and Morgan, 2008) can support the development of more effective, sustainable and situated retrofitting alternatives for residential suburbs. This is especially relevant in light of the newly released Spatial Policy Plan for Flanders, which, with its core principle "doing more with less", proposes the improvement of existing strategic built-up areas while preserving the open space with a definitive stop of building on new land by 2040 (Beleidsplan Ruimte Vlaanderen, 2018). The project aims at investigating and developing design related processes, tools and techniques for collective learning over spatial issues able to facilitate the participatory discussion, envisioning and sustainment of retrofitting alternatives and new meanings for residential subdivisions starting from the everyday of these environments, and, namely, by collectively understanding and reflecting upon how the actors of residential subdivisions live and wish and project to live in the future in these environments. The project particularly aims at developing processes and methods for retrofitting residential subdivisions able to improve these environments together with their actors (e.g. inhabitants, local organisations...) and capable to accommodate people needs while improving urban sustainability.

METHOD: Collective making and prototyping of residential subdivisions.
In order to enable experiential learning processes between the actors of residential subdivisions and the collective formations of and discussion about possibilities for retrofitting residential subdivisions, the research employs Participatory Design Methods with particular focuses on making techniques such as collaborative prototyping (Binder et al., 2015; Brandt et al., 2013; Hillgren et al., 2011). The making of things is here advanced not only as a shared tangible language facilitating communication between a heterogeneous group of actors with different backgrounds, but also as open-ended design processes between material making and democratic decision making, which facilitates the emergence of issues while rendering them public and experientially available for the direct engagement of the stakeholders (i.e. in what has been called within Participatory Design a 'Democratic Design Experiment', Binder et al. 2015). Making, as in collective prototyping, diverges from the making of prototypes in the modernist context, in which prototypes are artefacts resembling as close as possible the final output of design for later mass production, prototyping, as in Participatory Design, is here advanced to facilitate the direct engagement of citizens with matters of concerns as socio-material assemblies (Binder et al., 2011). Collaborative prototyping is developed as an open-ended collaborative material exploration of possible futures in the making in the face of a yet uncertain future development of residential subdivisions (Binder et al., 2015).



Example of developed model and components to lead interviews in the case studies.



To facilitate prototyping with multiple actors in different contexts and scales, the research collaborates with the designer Thomas Lommée and develops the tools employed in the research through the open source system OpenStructures that enables people to design modular artefacts according to a shared grid. In the images two projects by Thomas Lommée.



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CASE STUDY: Experimenting with making and prototyping in suburban neighbourhoods in Flanders
The research develops through two long-term and on-going case studies, the 'Kleine Wingerd' in Lanaken and the 'Witte Wijk' in Vosselaar.



Kleine Wingerd (Lanaken)



Witte Wijk (Vosselaar)

The 'Klein Wingerd' is a residential subdivision developed in the nineties to invert the trend that was seeing a large number of young people leaving the town due to the high cost of housing and the lack of local economy. Plots were offered at affordable prices for young local first homeowners to buy. The process resulted in a rather homogenous area composed almost entirely of single-family detached houses with little collective spaces an life and with the almost complete absence of connection with the bordering green area of the national park. The residential subdivision is today slowly ageing with an increasing underuse of private and public space.

The 'Witte Wijk' is a neighbourhood originally developed in the sixties as a social housing project for large workers families. They were provided with affordable housing and a large plot for growing vegetables and breed animals for family sustenance. Today, the area is no longer a social housing project and is hosting an increasingly heterogeneous population. The ageing of the original homeowners has resulted in the increment of newcomers with the gradual differentiation of dwelling practices and of housing typologies. A spontaneous process of retrofitting is developing together with 'infill' processes that lead to the slow densification of the area.

A number of inhabitants were so far interviewed to have a better understanding of how people live in residential subdivisions and how they wish and project to live in this environments and to enable challenges and opportunities to improve the sustainability of dwelling practices and spaces to contextually emerge and be discussed. The individual sessions have been mediated by a sketch model of an average house and plot of the area and by several paper components (e.g. trees, furniture, urban furniture, means of transportation etc.) and by an aerial picture of the neighbourhoods, focusing on enabling a variety of contextual dwelling patterns (e.i. interwinement of dwelling spaces and dwelling practices) to emerge, with particular attention to dwelling patterns that hybridise public and private, individual and collective spaces and practices as fertile triggers to collectively question and envision retrofitting alternatives.



"A big issue is how to create shared facilities between close neighbours. I always think about what we can do together. We have a swimming pool and our neighbours can use it. When we have an overabundance of vegetables and eggs the neighbours can consume them as well."



"Everyone has a fenced plot, but perhaps we could open up fences and do things together....We could have a shared garden with different functions....it could create disadvantages, and everyone would need to be tolerant, but it could also create many possibilities."

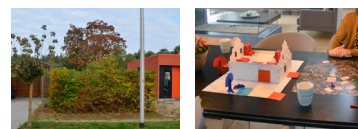
"Co-housing is possible also here if we develop the area together. We could build different units between existing houses for more people to live here and in the backyards have shared facilities."

"The neighbourhood should be better connected to the centre. The municipality should officialise the shortcut we made together the neighbours to cycle to the centre."

"Children can come and play in the backyard when they want, this is why we decided not to install a gate. The garden is a bit shared is true. We have a shared garden, never thought about it in this way."



"I designed the garden to be self sufficient. Having a large space needs to have a meaning. The garden needs to be productive, otherwise it is not necessary to own such a big space."



"There was a separation between the plots. We removed it and instead, together with the neighbours, we planted bushes that support the local biodiversity. For us it is important that the nature in our garden is also good for the local birds and bees."

"Under the house I have a lot of underused space. This space is now a storage for other people, for my brother but also for other neighbours who need it."

"Regulations in Belgium are not ready for new forms of living. I want to share my space, but laws don't allow me to do it. If other people live in this house they can not have their domicile here."

DISCUSSION:
The collective making through the models supported trust and reduced the distance between the participants and the researcher. Their use enabled the sessions to take place in a space where participants felt comfortable. Using the material provided, participants were able to tangibly explain how they live and wish to live. At times, the visualisation helped them to evaluate and reconsider their dwelling patterns leading sometimes to the prototyping of proposals for alternatives. Making alternatives tangible enabled both opportunities and dilemmas about future ways of living to emerge and be discussed. Furthermore, the sessions highlight existing spaces where micro- (inhabitants) and meso- and macro- (municipality, region) visions don't coincide. Finally, the sessions showed that although residential subdivisions are characterised by individualistic modes of living, sharing practices exist with sometimes the hybridisation of individual and collective, private and public spaces and practices and that fragmentary, new meanings for residential subdivisions are contextually emerging over time. The first experiments with models will inform the further development of making and prototyping tools and techniques for collective learning in residential subdivisions that will be developed using the open source system OpenStructures.