Research paper

Care in the (critical) making. Open prototyping, or the radicalisation of independent-living politics

Le care dans le faire (critique). Prototypage ouvert ou la radicalisation des politiques de la vie indépendante

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In this paper, we reflect empirically on some collective attempts at intervening the ways in which care for and by disabled people is being devised and carried out in Spain in austerity times. We highlight the novelties and challenges of the way in which these projects seek to tackle the current crisis of care through different forms of self-fabrication of “open” and “low cost” technical aids. We analyse them as forms of “critical making” expanding the repertoire of independent-living and disabled people’s rights politics to the experimentation with technological production. Through the deployment of an empirical example of the prototyping process by the Barcelona-based activist design collective En torno a la silla, we show how open prototyping constitutes a major challenge for the radicalisation of the independent-living movement’s precepts of control and choice, displaying the matter of care arrangements and making available its transformation.

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1. Introduction: developing independent-living advocacy in Spain

The independent-living movement developed recently in Spain. In 2001, a lively small group of activists created a mailing list to promote the right of disabled people to independent living in the country. Their challenge was to intervene an institutional and political context dominated by Christian charity and the medical-individual model of care, organised around huge sectorial disability associations managed on the most by relatives or professionals (Maraña and Lobato, 2003). Contrary to that, the Independent Living Forum (Foro de Vida Independiente) as it was originally named sought to create a virtual community organised around the values of direct participation, self-management, experience-based knowledge, as well as the promotion of disabled people’s rights through practices of empowerment and the fight against discrimination. Translating the motto and the philosophy of “nothing about us without us”, this small but hugely influential group was responsible for the creation in 2006 of the first Independent-Living Offices, pilot projects funded by municipal or regional administrations, to self-manage personal assistance in Barcelona and Madrid – the notion of “centre” in Spanish resonates with residential homes and was thus avoided –. They also succeeded in claiming the right to personal assistance in the debates surrounding the Law 39/2006 for the Promotion of Autonomy and the Assistance of Dependent People, a legal enactment they fiercely countered because of its “ableist” groundings. And, more importantly, they managed to create a new conceptual framework around what they call the “diversity model” (Palacios and Romañach, 2006; Palacios et al., 2012; Romañach, 2009).

In contrast to the social model of disability (Oliver, 2013), the diversity model1 does not revolve around “dis/ability” but stresses the dignity of all human diversity (Rodríguez-Picavea, 2013). This shift is underpinned by the concept of diversidad funcional (functional diversity), coined in 2005 as

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1 This model has been developed by Spanish activists as a result of online debates about the experience of disability, and has entailed the production of a vernacular form of Disability Studies in the country. According to Javier Romañach (2010), one of its most prominent authors and activists, the diversity model is an extension or evolution of the social model of disability (Oliver, 1981). Drawing on a humanist approach, the model of diversity poses “functional diversity” as another form of “human diversity” and, hence, its advocates defend that all diverse human lives should be treated according to the same legal, moral and bioethical values (Lafaye and Romañach, 2010).
a substitute to other more patronising and pejorative terms traditionally used to define disability—*deficiencia* (deficiency or lack), *minusvalía* (handicap), *personas discapacitadas* (disabled people), *personas con discapacidad* (people with disabilities), *dependientes* (dependents)——. With this term, it is the diversity in bodily functioning that is highlighted as a common feature of humankind, not the distinction of dis/abledness. This explicitly anti-“identity politics” stance has granted its expansion and everyday use in many other critical social movements in the country: no particular traits of a collective or group are being claimed and defended, their target being to fight the historical discrimination against particular forms of functional diversity.

Since then, the notion of functional diversity has been central for the empowerment of these collectives in Spain (Toboso, 2013), giving them a political voice and allowing them to weave strategic alliances within the academic world and activism (Pié, 2012), mostly within feminist debates around the transformation of care arrangements. However, despite this creativity in conceptual and organisational explorations, the independent-living movement experienced in 2010 a relative decline. The progressive incorporation of independent living claims into mainstream political agendas has had the paradoxical effect of reinforcing a dependency model, favouring residential services and professional charities. This situation has worsened by the effects of the austerity measures implemented by Spanish government to tackle public deficit. All of which has had profound implications for the Independent Living Forum, including a relative discouragement of protest and new memberships.

This tendency began to change during the 15M (the “indignados”) uprisings in May 2011. As it is well-known, this refers to a series of demonstrations organised by different groups demanding “Real Democracy Now” simultaneously in several cities. These protests demanded a radical change in Spanish politics, denouncing among other issues political corruption, unemployment, welfare cuts, the support received by banks and the democratic deficit of Spanish institutions. After several clashes and under the motto *No nos representan* (they do not represent us), millions of Spanish citizens occupied the squares to demand—— and experiment with—— a more participatory and direct politics. As it has been reported, the 25M uprisings have significantly changed the Spanish political landscape since 2011, having also inspired similar developments around the world (Postill, 2014). This was also a very fertile moment for the transformation of the independent-living movement. Under the general atmosphere of experimenting with participatory, direct and inclusive forms of democracy, several new political alliances were formed.

In this paper, we would like to reflect ethnographically on the experience of one of them, the Barcelona-based activist design collective *En torno a la silla* (ETS), exploring different open prototypes and collaborative design processes, seeking to experiment on and intervene in disability-oriented product design and services. To contextualize, in the following section, we introduce the notion of “critical making” (Ratto, 2011), a descriptive trope of collaborative and making practices critically exploring the matter and infrastructures of everyday life, and we will connect it to the rise of projects in Spain, such as ETS, where the ideals of open design, co-production and experimentation inspired a critical exploration of material arrangements grounding on functional diversity ideas. Later, we narrate through three ethnographic vignettes the open prototyping process of a portable wheelchair ramp developed by ETS, paying special attention to how “conception”, “testing”, and “licensing” processes are opened up. Building from here, we discuss how in opening up the knowledge, design and division of labour implied in existing care arrangements, this project weaves together critical making or open prototyping practices and independent-living politics. To conclude, we engage in a short reflection on the role of open prototyping to re-democratise the independent-living project.

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2 See, for instance, the debates transcribed in the *Cojíos y precaríás haciendo vidas que importan* (Cripples and precarious making lives that matter) book (Foro de Vida Independiente y Divertid & Agencia de Asuntos Precarios Todas a Zien, 2012) where the role of personal assistance as a figure of empowerment for the functionally diverse and as a potentially precarious form of care-work for the feminist care ethics activists was addressed, bringing to the fore diverging ideas of care ethics and interdependence, very much along the same lines described by Shakespeare (2006).
2. The “critical making” of independent-living

“Critical making” was coined by Matt Ratto (2011) as an umbrella term signalling a research programme promoted by social science and humanities scholars and activists working on design in order to explore a new vernacular register for the critical engagement in technoscientific matters, such as the design of care technologies, beyond the traditional social scientific or activist genres and outputs (theories, ideas or concepts circulated in papers or pamphlets and presentations). In order to do so, they have been analysing and developing what Ratto, Wylie and Jalbert call “materialist interventionist methods” seeking to “counteract the ineffectual linguistic bias of traditional critiques of technoscience” (2014:86). In a nutshell, abandoning external forms of debunking matter-of-factly in order to engage in forms of interference that proceed vernacularly through design practices – e.g. prototyping workshops or DIY production –. Their aim is to explore, materialise and intervene in “the politics of design” (DiSalvo, 2014) through critical design practices. That is, critically and passionately engaging in exploratory practices of relevant issues whereby participants “[...] together perform a practice-based engagement with pragmatic and theoretical issues” (Ratto, 2011:253) through joint discussion of concepts and ideas in collective and experimental iterative processes of prototyping, so as “to extend knowledge and skills in relevant technical areas as well as to provide the means for conceptual exploration [...] exploring the various configurations and alternative possibilities [of the prototypes], and using them to express, critique, and extend relevant concepts, theories, and models” (Ratto, 2011: 253).

In doing so, they point at the “need to conceptualise making practices in ways that serve to reinforce, maintain, or trouble current structures in society, their relations to technoscience, and what kinds of knowledge work they incite” (Ratto et al., 2014: 89). Despite its similarities with other recent changes in design culture3, its distinct features reside in its “broader focus on the lived experience of making and the role this plays in deepening our understanding of the socio-technical environment” (Hertz, 2012: 4). Indeed, beyond stressing “collaborative work” or “inclusion”, critical making should rather be understood as a practice of joint learning or joint exploration of the matter and infrastructures of our everyday life.

We believe in the enormous interest of using the trope of “critical making” to reflect on the very relevant series of displacements operated by the independent-living movement in Spain in the advent of both “crisis of care” and “post-austerity measures”, departing from what might be called conceptual and organisational explorations (forging, as we saw in the previous section, a self-definition and care arrangement prototypes to counter institutionalised forms of disability care) to more recent material explorations (engaging collectively in the fabrication of open technical aids prototypes (De Couvreur et al., 2013) beyond privately-designed technical aids subsidised and delivered by the public administrations).

The displacements giving rise to these open material explorations have to be connected to the 15 M uprisings, despite there have been some other projects exploring some of these issues before. For instance, since 2006, the “low cost resources” (Recursos de Bajo Coste) platform – developed by the CRMF Albacete, under the umbrella of the state’s CEPAT4 –, holds a yearly workshop with prizes to make visible and document different sorts of caring “little arrangements” (López, 2015): that is, low cost innovations (not necessarily meaning free, cheap or costless, but using available materials and skills) done by users, relatives or friends in a collaborative fashion (Zamarro, 2011)5. These

3 In the past decades, there have appeared different schools and programs seeking to reflexively problematise or politicise different aspects of design practice (DiSalvo, 2012): searching to produce social change through the deconstruction of the position of authority of creators, hence involving the users as co-designers in the conceptualisation, fabrication and testing (e.g. participatory/collaborative design); engaging in design projects seeking to craft artefacts and devices to provoke critical awareness of the cultural-symbolic values and practical aspects of design culture, ranging from material extraction to the division of labour or the commoditisation of its products (e.g. critical and speculative design); but also promoting counter-hegemonic and ironic forms of using, conceiving, fabricating and consuming materials to do so (adversarial design).

4 CRMF standing for Centro de Recuperación de Personas con Discapacidad Física (Rehabilitation Centre for People with Physical Disabilities). CEPAT standing for Centre for Personal Autonomy and Technical Aids (http://www.ceapat.es).

5 The main core of Bajo Coste’s mission, a project with a very reduced budget developed and run by professionals (occupational therapists, mostly) engaged with independent-living politics and practices, is to maintain a digital repository
workshops have also helped to establish interesting relations with similar projects in Latin America. However, until very recently, they have been mostly addressed to a public of social and health services’ workers, rather than users. With the creation of 15 M’s functional diversity commissions in at least Madrid and Barcelona (Arenas and Pié, 2014), many worries regarding the democratisation and the need for a more developed citizen control of self-care technologies and urban accessibility arrangements came out and reached a broader public. This also happened to other collectives and some have highlighted this as a result of the particular practices there taking place (summarized as hacer plaza⁶).

Some social scientists describing what there happened have adopted some vernacular concepts and narratives, mostly from free culture activist, hacker ethic and copyleft practices, to describe the 15 M uprisings as an experimental “method” and temporary “hardware” assembling different ideas and people in plazas’ assemblies in order to invite anyone interested in the collective, open and networked reconstruction of democracy (Corsin and Estalella, 2013; Moreno-Caballud, 2015): its fully-documented, freely shared (i.e. using open access forms of licensing) and remixed assemblies’ methods and logs being a sort of political, urban, affective and technological “prototype”. Despite this might be a very specific account of such a multiple, nuanced and variegated set of events taking place in many locales, it has become impossible to deny the effect of the practices and logics of free digital culture and hacker ethics in the happening and the becoming of the very 15 M uprisings and the occupation of public space (Postill, 2014).

15M’s functional diversity commissions in Madrid and Barcelona forged new alliances between independent-living advocates, engaged professionals, manifold activists and regular people⁷. Indeed, these commissions created the conditions to engage in lively discussions with other commissions and activist collectives around the several democratization challenges faced (such as, the democratic deficit of care institutions, services and products), and also took in charge of conveying to the general assembly the worries they had regarding the potential environmental and normative barriers blocking access of diverse publics to the empowering dynamics there happening (such as the use of language, the design of assembly spaces, etc.). Their efforts were aimed at creating a space for the joint reflection of how functional diversity’s discrimination affected us all and fostered debates and talks seeking to publicise their experience and the many specific problems they were suffering because of the charity, biomedical-rehabilitative and “assistentialist” grounds of the policies and institutions addressing them.

The effects of these threads became also clear in several design projects that saw the light after these 2011–2012 political efforts, such as ETS. As we will show, displaying the open prototyping and testing process of one of ETS’s products (its portable wheelchair ramp), these different material explorations produce “infrastructural inversions” in the independent-living politics, politicising present epistemic and market forms of “care arrangements”, hence: (a) highlighting the knowledge and work implied in materialising particular care arrangements and forms of dis/ablement (López, 2015; Sánchez Criado et al., 2014; Schillmeier, 2007); (b) allowing for the experimentation with different materialisations of care for and by “functionally diverse” people, recursively opening up their knowledge, design and division of labour in an ongoing exploration of more self-managed arrangements.

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⁶ An expression referring to the ecosystem of values, spaces and assembly methods created by the long-lasting occupation of the squares, turning the main squares of Spanish cities into spaces for the encounter of very diverse people – most of them unknown to each other, with a low exposure to maintained activism, and not accustomed to these uses of public space –. As Fernández Savater (2014) reminds, the term hacer plaza has no elegant translation in English. It literally means to “make square”. “Square” in this context being the site of public assembly and occupation that proliferated after 15-M, and “making” referring to the entire range of democratic practices unfolding in these sites.

⁷ Their exhaustive assembly logs and some of the debates on functional diversity issues can be accessed from the documentary record left in their open blogs (Madrid’s Diversidad Funcional #Acampadase: http://madrid.tomalaplaza.net/author/diversidadfuncional; Barcelona’s Diversitat funcional BCN 15M: https://diversitatfuncional15m.wordpress.com).
3. *En torno a la silla* and its wheelchair ramp project

To be more specific, in this paper, we would like to reflect ethnographically on the experience of one of these projects, the Barcelona-based collective *En torno a la silla*⁸, that emerged in May 2012 out of the friendship developed during the 15 M uprisings of an independent-living advocate and different craftspeople interested in rethinking public space and care arrangements. Despite the collective has been changing, the project’s core team would be composed of: the founders (Alida Díaz, architect, with a long trajectory in different activist collectives; Rai Vilatóvà, anthropologist working as a craftsman, also with a long trajectory in different activist collectives; and Antonio Centeno, renown independent-living advocate), the documentators (Tomás Sánchez Criado joined in November 2012, in the role of resident ethnographer in charge of curating the blog’s digital documentation; Arianna Mencaroni joined in June 2013, a documentary filmmaker in charge of realizing a webdocumentary project, currently under development, and the video documentation of the collective’s activities), and recent incorporations (throughout 2014, several other leading independent-living advocates and makers with whom they had shared Barcelona’s 15 M “functional diversity commission” became more explicitly involved: Marga Alonso, Núria Gómez and Xavi Duacastilla, with Pepe Rovira, former technician as another intermittent figure involved in the collective).

Since October 2012, ETS has been exploring in a unique fashion in the country different open prototypes and collaborative design processes, weaving the redistributed innovation and amateur ethos of hacker culture, care ethics’ reflections on interdependence and the self-care and full-access philosophy of the independent-living movement, very much along the same line as other similar projects that have been taking place in other countries building on the prospects of 3D printing⁹, such as: Waag Society’s “low cost prosthesis”¹⁰, Sozialhelden’s plastic ramps¹¹, e-nable community’s prosthetic hands for children¹², or the failed WikiWheelchair project seeking to build an open-source wheelchair¹³. The most relevant activities of ETS in their first year revolved around the prototyping process of a portable DIY wheelchair ramp, which became the main object discussed and reflected upon as part of their involvement in the *Funcionamientos* workshop in Madrid’s Medialab-Prado.

ETS was one of the six projects submitted and accepted for its participation in Medialab-Prado Madrid’s¹⁴ *Funcionamientos* (“Functionings”) workshops, whose call for projects sought to host group and individual projects articulating ideas, co-producing or experimenting with the “open design”¹⁵ of objects affected by the philosophy of functional diversity. Two sessions in November 2012 and January 2013 were programmed, consisting of 3-day co-creation workshops. These workshops happened after several seminars and lectures hosted at Medialab-Prado between the winter of 2011 and the spring of 2012 on what they called “technologies of diversity”, reflecting on how the philosophy of functional diversity might affect or be affected by open design practices, as well as how to rethink accessible environments and technical aids from the perspective of open access standards.

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⁸ The collective’s name is a wordplay in Spanish pointing at the importance of focusing “on” (en torno) the wheelchair’s (silla) environment (entorno), as a means and object of relevant design interventions. See the website: https://entornoalasilla.wordpress.com.
¹⁰ http://www.lowcostprosthesis.org/.
¹³ See their Google+ community: https://plus.google.com/communities/105344423917493990493.
¹⁴ Medialab-Prado Madrid (http://medialab-prado.es/) is part of Madrid City Council’s Area of Arts, Sports and Tourism. It is conceived as a citizen laboratory of arts, culture and technology for the production, research, learning and public experimentation of commons-based design and cultural prototypes.
¹⁵ Open design (Van Abel et al., 2011) has been termed a practice of “design by everyone”, that is a community-based exploration, part of the “maker culture”, involved in the transformation of material culture boosted by the opening up of the knowledge production and the source-code of the design process and outcomes through use of free licenses for their distribution and dissemination.
ETS’s project\textsuperscript{16} – submitted and approved – had the scope to design three small objects that might become a freely licensed “wheelchair kit” to activate other possible relations with its technical and affective environments, that is acting, reflecting and intervening on them so as to habilitate not only its user but also his or her alliances. The kit was originally composed of three ideas: a portable wheelchair ramp, a folding table and a briefcase-armrest. The workshops took place in the gigantic art and culture hub called Matadero (where many neighbours attend to take part in many leisure activities), and they were open to the public (literally to anyone passing by), where the projects received the assistance of several mentors who helped in the production of the prototypes.

The ethnographic description of the following vignettes of the ramp’s prototyping process will be based on Tomás’s personal fieldnotes, as well as on the materials that he, together with Arianna and the other members of the collective, have produced for the visual documentation of their activities, involving: taking pictures of prototyping and fabrication situations or gathering pictures donated by others, gathering sketches, shooting videos, and archiving them using publicly accessible digital platforms, such as the collective’s blog and different social networks\textsuperscript{17}.

3.1. Opening up the ramp’s conception in MediaLab-Prado’s workshops

“January 18th 2013. In the past months, many efforts have been put so as to think the ramp’s shape and materials. In the first Funcionamientos workshop (in November), there was a discussion on the first metal and wood model that had been produced by Alida and Rai in Pepe’s workshop (another friend from the 15 M commission who is a handy man and former technician) to show a very simple draft as a starting point of the prototyping process. This was done in Barcelona after measuring Antonio’s wheelchair and under the supervision of Antonio with whom they discuss every development. In this first model, conceived by Alida and Rai, each track had two detachable pieces so as to enhance its portability, united when being used by a very rustic U-shaped tube helping tracks to fit into each other, and impeding detachment when being trod over by the wheelchair. It ended up chalk-painted in a collective exploration with the project’s mentors drafting out loud alternative junction methods to solve the main problem highlighted in the meeting (see Fig. 1): “the U-shaped tubes stand out of the bag when transporting them and they are a bit too dangerous for safe manipulation”, said one of them. Antonio’s personal assistant, also present in the workshop, had also stressed that they were a bit complicated to manipulate and to place because there was no handle. Despite the collection of complaints and alternatives gathered in November’s meeting, Rai and Alida wanted to test the material that was to be used in the final prototype (as discussed with the mentors) for the January session, but also the width of the metal plates affecting both the ramp tracks’ weight for safe manipulation and the supported weight for safe use. So, before attending the second Funcionamientos workshop in January, a similar version has been commissioned to an ironsmith, with MediaLab’s funding, in 3-mm thick anti-slippery extruded aluminium. The ironsmith, however, had a creative day and eliminated one of the two tube junctions (“it will be stable enough like this”), something that caused a bitter argument between him and Rai. This version also incorporates a new trick thought by Rai: a side-fold in each metal plate so as to avoid the wheels to exit the track.

\textsuperscript{16} https://entornoalasilla.wordpress.com/el-proyecto-original/.

\textsuperscript{17} The visual documentation compiled in the collective comprises both “research images” – those pictures taken primarily to produce a documentary record for the researchers (Tomás & Arianna) only, that sometimes were also shared with the rest of the collective to reflect on prototyping endeavours – and “images for exhibition purposes” – those pictures taken by the collective’s members to document the processes of making and in order to be published in the blog; sometimes, due to the fact that the researchers were part of the collective, there was an overlap of the two kinds –. In all different situations, special care has been put to register the specific context of production of those images, something crucial for the documentary record of both of our ethnographic research, in line with standard visual ethnography procedures (see Pink, 2007), and the open discussion of the collective’s practices.
Anyway, today we have brought it to Madrid for an open discussion in Matadero’s open space. It’s a Sunday morning and many regular people come and go. At the appointed time, a collective discussion with several of the mentors starts. Rai begins by placing the ramp on a step to test it. Antonio starts climbing up and down to understand if it can stand the wheelchair’s weight, and I record the whole situation with my smartphone. The mentors (Carlos “Txarlie” Tomás – engineer working on open health technologies –; Mario Toboso – STS and Disability Studies scholar –, Antoni Abad – sculptor and digital artist in charge of the in/accessibility mapping device megafone.net –, and Alma Orozco – artist and curator of the Funcionamientos workshop –) start debating again about the problems of the junction and the whole conversation slowly centres on how to design a folding method allowing the two parts of the track to be united. Rai debates with Txarlie on the possibility of using a mechanism similar to a hinge. All of a sudden, a man we don’t know starts to hang around, listening to our quarrels: “maybe it would bend in the middle… “cos the tube acts as a reinforcement to prevent the plate from bending when the wheelchair treads over… if it bends that would be dangerous”, says Rai. Txarlie answers that maybe the tube would still be needed. Out of the blue, the unknown man intervenes in the conversation, smoothly but vehemently (like he was a knowledgeable technician), grabs the ramp track’s two parts from Rai’s hands and arguments in favour of a folding method using a circular joint: “I’m not saying that you keep the bar, no, no, you place a knee-like joint here [in the middle], and that’s it… This [pointing at the ramp] can hold an elephant… This plate can support 120 kg without a problem, and in case you just you can use a wider one that supports more weight”. This starts a very technical conversation, lasting around 6 minutes with Rai and Txarlie (with the rest of us present) on how to conceive the folding joint and how it could be welded into the plate so as to create a joint distributing the weight’s pressure among the plate. Besides my smartphone’s video, Mario captured the concept for the junction in the form of a sketch. After an hour, the mentors have to meet another project’s team and we hang around this space, thinking aloud on what just happened. We will go back to Barcelona with 10

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18 Picture taken by Tomás whilst the collective debated with the mentors different folding and extraction methods than the one displayed by the first wood and metal 1:1 model (using a piece of chalk to draw over it). Later published in ETS’s blog: http://entornoalasilla.wordpress.com/2013/01/13/pruebas-del-prototipo-de-la-rampa-en-medialab-prado-16-12-2012 (used with permission).

19 See https://entornoalasilla.wordpress.com/2013/01/25/segundas-pruebas-del-prototipo-de-la-rampa-en-medialab-prado-18-1-2013/.

alternative draft ideas of a possible ramp that Alida has been gathering in each bar conversation and chat in the past days ("everyone has an idea for a ramp", we laugh many times), but we need to follow the thread of a single idea. Medialab has given us a slight amount of money to develop the last prototype from here. . .

Reconstruction from Tomás’s fieldnotes.

3.2. Testing in the open, entering Bar Mundial

Having gathered those sketches and ideas, when returning to Barcelona ETS members also returned to their everyday lives. After some months working on ideas from the alternative sketches and videos gathered to conceive the precise junction for the folding method, Alida and Rai created several wood models. These were shown to Tomás and Antonio. After several iterations going back and forth, they reached the conclusion that they had found at least a good new improvement of the folding method. The new method allowed the parts of the detachable track to turn together when folding, creating a slight new problem for storage and transportation, but making the ramp much safer and usable. The problem was that with the previous method, the U-shaped aluminium bars prevented the sheet serving as walkway from folding too much, and hence avoiding breakage or unexpected bounces that could cause the wheelchair to overturn. In the spring of 2013, the collective needed to test it, so the last bits of Medialab’s funding were used to commission what was hoped to be the last prototype of the ramp to the ironsmith.

“It is a cold evening in May 2013, and here, we have the definitive, or so we think, prototype in our hands: a two-tracked 3-mm-thick aluminium portable ramp for an electric wheelchair (each track weighting 5 kg). Alida, Rai and I picked it up from the smith workshop a few days ago and we made a blog entry about it. So here we are, ready to test it “in the wild” with Antonio, at last! The new method would allow the parts of the detachable track to turn together when folding, making the ramp much safer and usable. We still did not know if the ramp would bend too much in the middle because of the heaviness of the wheelchair. “Will the ramp work?” is a question that all of us four ask in many different ways when we see each other. We are almost sure it will, because we have tested previous models, be it the first raw prototype made in wood and iron or a previous aluminium model with very similar features, but one never knows. We still don’t know if the ramp will bend too much in the middle because of the heaviness of the wheelchair, weighting around 250 kg (125 in each track). In our calculations, Rai and Alida have estimated a maximum weight of around 150 kg in each track for it to be safe. And we are still unsure if the ramp might need improvements in the parts serving as junctures to the sidewalk and the step to be climbed, or entregas as Rai and Alida call them: a very beautiful technical term, having the joint connotations of a “consignment” or a “shipment” and the “commitment” and dedication of one person with a given cause. We believe that aluminium might be too slippery in its entrega with clay, and have thought of recycling used bike tires so as to create a rubber band system in each track enhancing the ramp’s grip.

We are anxious and start searching for possible inaccessible spaces around the ancient Gòtic district where we usually meet. Many bars have access ramps or street-level floors, which might not be very well-finished for wheelchair access, but they will not allow us to show the potential of our prototype! We need to find a step where we might put the ramp to work, where we might understand if it works or not and why. Then we find out the Bar Mundial, an elegant tapas bar with a bizarre boxing decoration. Alida measures the huge step in its entrance: “around 24 cm high”. At first we are doubtful, for our ramp has been designed for 20 cm steps on the max. Alida says: “No, it won’t work, it’s too high, it might be dangerous!” But Antonio is confident to give it a try and climb the step with his wheelchair, but only if he gets a little help by someone holding him fast so as to avoid “ending up upside-down”, he jokes. Alida gets into the bar and asks the
owner if we could open the entrance’s door standing leaf. Once this is done, Rai and Alida take the ramp out of the bag. Rai places the two tracks next to each other, checking the height (Fig. 2). “It’s too tall”, he warns Antonio, but the latter wants to give it a go. Rai places in the rear of the wheelchair so as to hold Antonio’s chair while he carefully moves his joystick. Meanwhile, I take pictures of the whole process with my cell as best as I can – it all goes so fast... and try to make rough notes so as to document what is going on and later post it on our blog. And then, all of a sudden, we made it! Antonio is up and safe, the ramp has resisted unaffected. It is working! Happy as we are, we are immediately received by the owner, trying to hide his guilt of not complying to the accessibility norms with over-infatuated friendly manners. After eating and drinking something, we leave. It works again!

Reconstruction from Tomás’s fieldnotes.

3.3. Opening up the meaning and the knowledge of the process: “The ramp is not the solution” blog post

The following summer was also a very intense one, in which the ramps were used by the members of the Barcelona Independent-Living Office as part of a summer trip23, as well as in other

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22 Taken by Tomás, later published in ETS’s blog: [http://entornoalasilla.wordpress.com/2013/05/18/poniendo-en-uso-la-rampa-mayo-2013](http://entornoalasilla.wordpress.com/2013/05/18/poniendo-en-uso-la-rampa-mayo-2013) (used with permission).

actions – such as breaking in pubs and bars in doing what the collective have come to call jokingly “assaults”24 – that were reported in the blog. All of these actions using the ramp led to many discussions over the political potential of the ramp. Some involved veiled accusations by other independent-living advocates of “collaborationism” with inaccessible places that were against the current accessibility law and should be prosecuted, as well as disputing the visual and text language used in the blog, dimmed poetical or metaphoric. These affairs lead the collective to publish several blog posts as a matter of clarification. One of them, mainly written by Alida – the architect of the group – and receiving the input of the rest of the collective, read as follows25:

“We have received some friendly comments pointing at the fact that the portable ramp is a “false solution” to the problem of accessibility. For some, it is too personal a solution, given that it only solves the problem of access for one person or a few people and to a given place. For others, its use is extremely dependent on the possibilities granted by the situations in which we might want to use them, that is: the will of others to help us, obstacles that do not cause more problems than those seen at first glance, etc.

In almost all of these comments, a reference is made to the fact that as we use it, the ramp entails some sort of sell-out to the always-pressing need to vindicate a city, public equipment, and an urban life that might be accessible and for all. From this stance, the right thing to do would be to make evident and to report the fault and not to take care of it. The debate got extremely interesting in some personal posts on the social networks but, just like almost everything happening on Facebook, it was quickly discontinued.

We’ve been thinking for some time what the ramp might mean. Together with the technical issues (weight, costs, materials, measurements, the ways of handling and deploying it), other more conceptual issues have been unfolded (is the ramp an assault machine, an infrastructure, a technique of the self, a strategy?). Sometimes, these terms being entangled, we might be using the ramp as a tool for intervention, as a form of engagement or commitment, as a way to build bridges with others...

With it, we do not claim to be solving the problem of universal accessibility. Neither we search for a definitive solution. We seek instead to activate some possible relations with the environment. The ramp displaces the problem to the person responsible for a given urban setting. The problem is transferred to this place, that shop, that space… and from here, we might create a possible link, with all the difficulties to solve thereon. The ramp doesn’t solve anything. On the contrary, it displays the problem, making it evident, tangible, and attainable. We believe that it is in the practice of liberty to access a place that the ramp’s use acquires its true meaning.

The fight for laws having accessibility as its main concern could be as liberating as “giving” ourselves the effective and untimely access to a place by our own means. It is not the object in itself that liberates, but the exercise of liberty, and it is not the laws by themselves – as experience has taught us – that guarantee rights and sanctions, but their actual exercise.

By the way, we love this answer Michel Foucault gives in an interview, talking about architecture:

‘Q. Do you see any particular architectural projects, either in the past or the present, as forces of liberation or resistance?
M.F. […] I do not think that there is anything that is functionally – by its very nature – absolutely liberating. Liberty is a practice. So there may, in fact, always be a certain number of projects whose aim is to modify some constraints, to loosen, or even to break them, but none of these projects can, simply by its nature, assure that people will have liberty automatically, that it will be established by the project itself. The liberty of men is never assured by the institutions and laws that are intended to guarantee them. This is why almost all of these laws and institutions are quite capable of being turned around. Not because they are ambiguous, but simply because “liberty” is what must be exercised.

24 See https://entornoalasilla.wordpress.com/2013/10/02/cualquier-sistema-octubre-2013/.
25 Foucault’s original quote was from the Spanish version of the text. We have included here the English one. The original could be seen here: https://entornoalasilla.wordpress.com/2013/11/10/la-rampa-no-es-la-solucion-noviembre-2013/.
[...] it can never be inherent in the structure of things to guarantee the exercise of freedom. The guarantee of freedom is freedom’ (Foucault, 1984: p.245)” (Our translation).

In a way, we could say that this paper is no more than a large commentary to this post, translating it and putting it in context for an academic audience interested in contemporary transformations of care arrangements and independent-living politics.

4. Open prototyping as displaying or opening up the matter of care arrangements

Using examples very similar to ETS’s portable wheelchair ramp and the sorts of workshops in which it gradually came to see the light, Carl DiSalvo describes prototyping practices as dialogic design processes “in that, its structure is one of exchange and its purpose is the discovery and elucidation of the conditions or factors of a design. As a dialogic endeavour, the participants are engaged in a kind of conversation with and through the materials of design and the qualities of those materials” (DiSalvo, 2014:100), not an isolated conversation but “a conversation with other people” (DiSalvo, 2014:101) in which the “object functions in a manner analogous to a boundary object […] by providing a focal point for drawing out and focusing the issues of any design activity” (DiSalvo, 2014:100), being “[…] a means to an end, and achieve value though the act of shared construction, joint conversation, and reflection” (Ratto, 2011:253). Indeed, in ETS’s blog post, the prototyping or exploration of a portable wheelchair ramp was described as a form of open display: of the problem of inaccessibility that the collective seeks to attain, of the solutions devised and the knowledge there produced.

Unpacking our argument from here, we contend that ETS’s portable wheelchair ramp project as described above could indeed be characterised as being the deployment or the display of an open-prototyping process. And we would like to consider it as a particular form of epistemic/political experiment (Corsín, 2014) to tackle what Ratto calls “wicked problems” through “a shared process of making as a common space for experimentation [that] encourages the development of a collective frame while allowing disciplinary and epistemic differences to be both highlighted and hopefully overcome” (Ratto, 2011:253).

In this vein, Corsín characterises open source prototypes not only as a new form of peer production (Powell, 2012), but also a different way of crafting knowledge, opening up or inscribing in themselves the very documentation used in their construction, hence “prefiguring a knowledge-based economy, which thrives on the circulation of images rather than objects” (Küchler, quoted in Corsín, 2014:384). That is where documents, pictures, technical specifications and all attached media both describing and performing the existence of the very prototype circulate allowing for other objects to be likewise prototyped in a recursive manner.

This is what leads Corsín to call prototypes “inscriptive” and “recursive”, yet “porous” or “perpetually unfinished” (perpetually in beta) objects part of an epistemic culture allowing relationships and objects to be “more than many and less than one” in Corsín’s terms, that is cultural forms: “always on the move and proliferating into affinal objects, yet never quite accomplishing its own closure” (Corsín, 2014:385). This perpetual state of non-closure and recursion signal their importance in a redistributed epistemic culture of experimentation beyond the regular actors performing it, beyond the sites where scientific knowledge is being made and validated, and beyond the conventional depiction of experimentation as the control of variables in the natural sciences closed laboratory (Gross and Khron, 2005). Indeed, following Dickel et al. in the spaces where these open-source prototypes are being created nowadays – fablabs, medialabs, co-creation and peer production workshops – there is an expansion of the meaning of experimentation “to designate systematic learning practices by means of specific […] installations” (Dickel et al., 2014), such as the ones taking place in peer production workshops in which ETS’s project was born.

In the wheelchair ramp project described above the different open conversations, raw sketches circulated online and offline, and casual use tests were addressed at collaboratively understanding the adequacy of its design, in order to identify its flaws and problems. But in this independent-living version of something resembling Galileo’s “inclined plane” experimental device (Stengers, 2006), it is not the principles of the physics of the falling bodies that are primarily at stake. As we see it, ETS’s open tests could rather be considered part of a collaborative exploration – sometimes looser in open
workshops, sometimes tighter and restricted to the very ETS members – on how alternative care arrangements could be devised. Such tests are important because they serve as part of a process of small and precarious experiments of different kinds to elucidate its potential as a future low-cost product and not an eternal beta-product, since the ramp has to be useful to meet the needs of a very vulnerable target collective, living in conditions of semi-poverty (Braithwaite and Mont, 2009): for instance, the easy availability of cheap-yet-resistant materials used, the search for an easy-to-build solution, the clarity of the information provided to others to start their own DIY process through drawings, tutorials, and an open access and easily available documentation of the design process are under permanent test, having become sources of anxiety and of exploration throughout the project.

In fact, it is not only the very design that was being tested in “assaults” like the one performed in the Bar Mundial. What is being tested submitting accessibility politics to the “inclined plane” of ETS’s portable wheelchair ramp project is also the collective capability to affect the places the ramp is helping to intervene, because this prototype is not thought of as a mere ready-made piece of portable urban furniture so as to allow wheelchair access. Given the activist aspirations of the collective building it, the ramp is deployed as an exemplar of a “material culture of protest” – characterised by precariousness, scarcity of means and failure but also richness in ends (to say it with Flood and Grindon, 2014:12) –: a symbol of ad hoc and visible interventions, seeking to make access issues a matter of public concern. In this vein, such a critical making project materialises the politics of design in a process leading “to an elucidation of the politicised factors of practice expressed in prototype product form” (Disalvo, 2014:104).

This is why ETS might be thought of as a particular experimental device akin to Dickel et al.’s description of “real-life laboratories,” a concept they use “to describe semi-protected spaces that are established for experiments between knowledge generation and knowledge application” (Dickel et al., 2014). That is, semi-open spaces “for experimental innovation practices in contexts of peer production,” given that “[…] peer production itself is a real-life-experiment in societal transformation” (Dickel et al., 2014). Indeed, this open display of knowledge and political experimentation operates a particular displacement or, in Star and Lampland’s (2009:14) terms, an “infrastructural inversion” opening up the usually back-staged matter of personal and urban care arrangements: the division of labour and the asymmetries it usually implies (between experts and lay people, between innovators and end users) in contemporary arrangements involving particular forms of market provision and commodification of these technical aids in public and private markets. An infrastructural inversion allowing a conceptual and political displacement of care and disability debates: from a focus on the ways in which there is a need to tinker with standardised technologies in order to “adjust to them” and personalise them (Ott, 2002), despite full adaptation is commonly not possible and a good compromise has to be reached, to an interest in understanding the prototyping of new material care arrangements for independent-living. Despite tinkering might be seen as a caring practice (Winance, 2010) when these technologies cannot be changed, it might also be taken as a conservative strategy that does not challenge the pre-inscribed knowledge and configurations of orthopaedic design. These attempts at prototyping, however precarious, do not merely take the objects’ design for granted but question and put under examination their very configurations, making available ways of learning how to create other alternatives.

And finally, what is also being tested and experienced is the very vulnerability, precariousness and fragility of the collective building it: indeed, their personal and collective aspirations and hopes are being tested every time; but also the necessary alliances between craftspeople and independent-living collectives to make the project a bit more stable, and their strength to work with a no-budget horizon in a project in which they are learning a lot, but which takes a lot of time. Yes, it might become part of the way in which they might make a living in the future, but none of this might happen if the low-cost ramp (now a single and nearly worn-out prototype) does not become a market product, allowing them to earn some money to either continue freeing objects or acting as paid technical aid “hackers”. All of these bundled outputs of ETS’s particular “inclined plane” might only be recognised and worked out in tests such as the one depicted before, needing of subsequent collective situations to articulate in words what there happened (such as the conversations when preparing blog posts).

In sum, this form of opening up or displaying the prototyping process is indeed interesting in a particular form of politicising the matter of current care arrangements: that is, articulating open
alternatives that would recursively open up or revert the knowledge, political and organisational aspects of these arrangements allowing to go beyond the mere personalisation of technical aids or the sheer defence of urban accessibility infrastructures as “solutions by design” to the problem of independent-living, recursively re-infrastucturing what independent – living means. Or, to say it otherwise, making visible how care arrangements for the functionally diverse might be rethought by the functionally diverse together with their alliances in order to expand the political repertoire of the independent-living movement on care matters, paying attention to the very matter of care. Something that expands the classic advocacy of the Disability Rights Movement for more controlled and user-led services enhancing the choice over one’s life (Beresford and Carr, 2012; Barnes and Mercer, 2006; Morris, 2004) to the joint prototyping of independent-living with others.

5. Conclusion: a radicalisation in independent-living politics?

ETS’s wheelchair ramp prototyping processes, as well as several other projects that we have been analysing in the past 3 years, point at the emergence of new sociomaterial forms of exploring independent-living and care arrangements for the functionally diverse beyond struggles for personal assistance. This statement might seem risky, given that many of these design worries and aspirations where also explored at the very beginning of the independent-living movement in the US (Lifchez and Winslow, 1979), also very keen on developing co-creative self-care prototypes – emphasising the importance of experimenting on the personalization of services and products (Pullin, 2009) –, be it through strategies of empowering the functionally diverse as consumers against technology developers through direct payments from the Welfare State (Ratzka, 2002, 2003) or ensuring universal accessibility “by design” (Imrie, 2012) in countries where independent-living rights have been secured.

As we have tried to show in this paper the most interesting and crucial aspect of ETS’s practices in austerity times lie on the fact that their critical making activities, such as the portable wheelchair ramp, entail another turn, resonating with the creativity devised to produce handmade solutions, or more or less temporary arrangements using materials at hand in places where the structural conditions of inaccessibility and discrimination are even harsher, such as in the Global South (Charlton, 1998:87–88, 104–105; Hotchkiss, 1985; Schaub et al., 2011; Srinivasan, 2002; Werner, 1998). The whole point of these prototyping processes is not only speaking for one’s self or defending an already existing legal framework guaranteeing rights and equal opportunities, but also taking part in the definition of the technical and material aspects defining independent-living. They also involve something more than participation. Taking part in the production of these open prototypes also entails redistributing the expertise and knowledge to produce this self-care machinery. However, the most important aspect is that the little infrastructural inventions they allow provide occasions for the recursive transformation of independent-living, radicalising and forking (to use hackers’ wording to refer to the versions produced by variations in code) the practical meaning of the motto “nothing about us without us”.

To be more concrete, these practices of “open source prototyping” might be opening up a new form of political experimentation for independent-living revolving around the possibility of granting the right to shape one’s life supports (Winner, 2007). This fork would allow the functionally diverse to go beyond becoming a powerful consumer lobby of technical aids or defending the self-management of personal assistance: open prototyping means experimenting collectively with solutions and co-producing more or less precarious or complex arrangements for personal and urban care; making visible the utmost political importance of the very task of materially infrastructuring one’s self-care; but also guaranteeing the sociomaterial conditions of interdependence allowing the self-management of personal care, where these rights are something conquered or created and not only granted by others (Biehl and Petryna, 2011).

In sum, if democracy has always relied on “prosthetic devices” to allow the “politically-disabled” to participate, as some STS scholars have pointed out (Callon, 2008; Latour, 2005:21), these open prototyping projects would entail a democratising intervention in the expert-driven, ableist and commoditised bodily arrangements that “prosthetic” and “assistive” devices have fostered under the medical model, reinforcing “outmoded categories of dependency and victimhood for those who use them […] [tracking] the technologies into professional and consumer groups where few people will
find out about or benefit from them” (Ott, 2002:21). Hence, opening up the design processes in such prototyping strategies, indeed could be considered a democratic gesture that might help to radicalise the independent-living project. That is, both “repolitising” the movement and “going to the root” of its particular sociomaterial arrangements to experiment with viable alternatives.

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References

Fernández Savater, A. http://criticallegalthinking.com/2014/04/21/notes-non-statocentric-politics/


