Chapter Eleven

Caring through Design?:
En torno a la silla and the ‘Joint Problem-Making’ of Technical Aids

Tomás Sánchez Criado and Israel Rodríguez-Giralt

11.1 Introduction: the issue of technical aids in post-austerity Spain

Barcelona, Spring 2013: Our friend Antonio needs to buy a new wheelchair. His old one has lasted around 5 years and it’s about time he had a new one: the wheelchair, including its batteries, suspension and seating, are in a worn-out condition. But the times are not auspicious for this. Several articles have appeared in the press reporting significant delays1 in the reimbursement of state subsidies (even leaving many of these products unpaid for). Others reflect on the worrying prospect of the brand new ‘co-payment’ schemes – resulting directly from the state’s health and social care spending cuts2 – which oblige users to cover 10% of the cost of prostheses and technical aids as part of the publicly-subsidised ‘catalogue of orthoprosthetic technologies’.3

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In any case, the situation has never been very good: even before co-payment measures came into effect, users had to pay for orthopaedic technical aids in advance, and only after a prescription had been obtained from the user’s GP could any reimbursement be processed. For instance, the Catalan regional government’s ‘catalogue’ stipulates that two motor wheelchair models are available priced between 3100€ and 3800€. Antonio has savings, so the cost is not a problem, but how could a disabled person with a non-contributory mean pension of 365.9€ per month buy a new wheelchair unless she or he has savings, works, borrows money from relatives, or successfully applies for a bank loan?

Indeed, as we discovered, the federation uniting Spanish orthopaedic shops (FEDOP) is now supporting what they call the ‘Yellow Cross initiative’ in an attempt to equate themselves with pharmaceutical dispensaries that use a distinctive green cross. They worry that direct purchases through global – and usually far cheaper – online retailers will take them out of business, and are lobbying the public administrations to enforce regulations on – or even ban – what they term the ‘non-regulated’ online market for technical aids. Their main motivation, or so they say, is not greed: online retailers, according to FEDOP, cannot guarantee that the products are certified, which may have a negative impact on the health of users. Orthopaedic shop dispensaries also – allegedly – provide users with something online retailers do not: expert advice.

Our wheelchair-user friends are rather wary of these claims, regarding the campaign with sheer scepticism. As Antonio has discussed many times with those of us in En torno a la silla (ETS) – the collaborative design collective which has worked together since the autumn of 2012 – the orthopaedic shop is usually not the main provider. Indeed, the shop only acts as an intermediary between the retailer and final user. In practical terms, this means that if any damage occurs to the product when being delivered to the shop or the product malfunctions, no damage compensation can be claimed.

However, the financial issue is just one aspect. The design of the wheelchair – and by this we mean both its appearance and functionality – is another major consideration. There are few options available, and if users want to access public subsidy, these options are even more

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4 At that time the 2008 Catàleg de prestacions ortoproètiques a càrrec del Servei Català de la Salut (p. 42) was available online but it has been taken down recently.


limited: just a few products are approved, and the aid only covers the most basic equipment. This means – and here is where the orthopaedic shops usually increase their profits – the cost of any additional gadgets to make the wheelchair more comfortable will not be reimbursed. If anyone wants these they are on their own. Approved products usually have extremely unattractive hospital aesthetics, but one cannot do much about this when relying on subsidies.

Last but not least, the most troublesome prospect of having to buy a new wheelchair for Antonio is the necessary adjustments required in his bodily position. However much care is taken to make this as easy as possible, the process of adjusting to a new wheelchair is always very painful. The week after he finally gets the new wheelchair – a much smarter black one, with a more precise joystick and better circuitry as well as compact wheels improving suspension and thereby producing less strain on uneven ground – Antonio always looks extremely tired: he is experiencing many spasms, even during the night. ‘The body moans a lot’, he says, not only referring to spasms but also to other aches and pains. In an interview filmed by Arianna, the collective’s filmmaker, Antonio describes his feelings:

... you are always having to play between two main axes... On the one hand, these supports [productos de apoyo] help you a lot in your everyday life... On the other hand, they seldom adjust to what you need, and most of the time you are permanently adjusting to them... and in a very passive way... For the most part you have to merely test what others have thought might be good for you, not the other way round.7

As if this were not enough, the new wheelchair also requires intervention from the collective’s craftspeople. Antonio was carrying a replacement of his right armrest we had been working on over the past months: a collaboratively designed briefcase gadget, the manufacturing process of which had been documented with an open design philosophy, not only making the pictures, drawings, sketches and ideas that this briefcase embodied available, but doing so using free/libre licenses so as to encourage others to replicate and actively elaborate on ideas developed by ETS.

(Reconstruction from Tomás’s fieldnotes)

In this chapter, we will discuss the practices of ETS, which involve fostering small DIY interventions and collective material explorations, in order to demonstrate how these present a particularly interesting mode of caring through design. They do so, firstly, by responding to

7Excerpts taken and translated from https://www.youtube.com/watch?v=YAITUPWQ1WQ (accessed 9 May 2016).
the pressing needs and widespread instability that our wheelchair friends face in present-day Spain, and, secondly, through the intermingling of open design and the Independent-Living movement’s practices and methods, which, taken together, enable a politicisation and problematisation of the usual roles of people and objects in the design process.

In the more conventional creation of commoditised care technologies, such as technical aids, the role of the designer as expert is clearly disconnected from that of the lay or end user (López 2015; López and Sánchez Criado 2015). Rather, technical aids are, as we have seen in the ethnographic reconstruction at the beginning of this chapter, objects embodying the expertise of the designer to address the needs of the user. As we will argue, ETS evolves a ‘more radical’ approach to the design of these gadgets through what we will term ‘joint problem-making’, whereby caring is understood as a way of sharing problems between users and designers, bringing together different skills to collaboratively explore potential solutions.

In the remainder of this chapter, we will provide some context surrounding the emergence of ETS as a collective in post-austerity Spain (see also Sánchez Criado et al. 2016 for context) and describe some of the radical transformations in the roles of designers and users this process entails by focusing on an ethnographic reconstruction of the collaborative design of Antonio’s DIY briefcase by ETS. In analysing this process we will create a dialogue with relevant science and technology studies (STS) and design literature in order to understand to what extent ETS’s practices might be said to have unravelled ‘more careful’ ways of approaching relations between designers and users, by moving beyond commoditised forms of participatory design, and venturing into collaborative and interrogative explorations.

11.2 An open-source wheelchair kit: expanding the relationship between people in wheelchairs and their social and urban environments

The origins of ETS and its interest in the open design of technical aids needs to be placed in a broader context of the deep transformations occurring in Spain in recent years. This change is particularly epitomised by the ‘15 M movement’, usually known in Spain as the indignados (the outraged), and refers to a series of demonstrations that rapidly became encampments between 2011 and 2012. These were organised in various cities simultaneously by groups demanding ‘real democracy now’. Under the motto No nos representan (They don’t represent us!),
protesters called for a radical change in Spanish politics, denouncing, among other issues, political corruption, unemployment, welfare cuts, the support given to the banks and the democratic deficit in Spanish institutions. In some cities, such as Madrid and Barcelona, the occupation of main squares lasted over a month. It is important to note, however, that due to the widespread use of assemblies and the proliferation of digital platforms, those squares turned briefly into a ‘city within the city’, into inclusive places of encounter and conviviality, into spaces for direct participation, experimentation, openness, and critical thinking.

Organising themselves into commissions and assemblies, establishing practical and economic infrastructures, both digital and non-digital, the ‘15M movement’ progressively became a prolific space of encounter and experimentation: an urban, technological and political ‘prototype’ through which people, ideas, cities and very different activist cultures and practices were brought together and playfully ‘remixed’ (Corsín and Estalella 2014). Our use of these vernacular concepts and narratives from the free culture movement and hacker activists is intentional. As a number of social scientists have argued, it is important to acknowledge the centrality of the practices and logics of ‘free digital culture’ and ‘hacker ethics’ – such as the use of collaborative forms of thinking and documentation, or open access forms of licensing – in the 15M uprisings and the occupation of public space (Postill 2013; Fernández-Savater 2014).

But the diverse activities of the 15M movement, with their promise of inclusiveness and openness, also attracted people and groups usually reluctant to attend – or even marginalised from – these kinds of events. This was certainly the case for the ‘functionally diverse’: a positive self-representational denomination used by Independent-Living advocates in Spain (the noun being diversidad funcional, ‘functional diversity’, that addresses not only ‘people with disabilities’ but all of us). Stimulated by the inclusive and participatory atmosphere in the occupied squares, several functionally diverse people – most with activist backgrounds and particularly from within the Spanish Independent Living Movement⁸ – congregated in the squares. This was

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⁸In 2001 the Independent Living Forum was created as a virtual community of disabled people inspired by the American Independent-Living movement, which practised a more direct form of activism based on values of empowerment, self-organisation, experience-based knowledge and a stronger defence of disabled people’s rights. Translating the ‘nothing about us without us’ motto into Spanish, this small but hugely influential group has been responsible for the creation of the first Independent-Living Offices in Spain, the inclusion of the right to personal assistance, and a new conceptual framework reworking the ‘social model’, which they term the ‘diversity model’. See Sánchez Criado et al. (2016) for further context.
particularly apparent in Madrid and Barcelona, where this participation inspired ‘commissions of functional diversity’ (Arenas and Pié 2014).

These ‘functional diversity’ commissions created the conditions for engaging in lively discussions with other theme-specific commissions (health, infrastructures, etc.) and activist collectives about the several democratisation challenges faced (such as the democratic deficit of care institutions, services and products), and conveyed to the general assembly concerns regarding the potential environmental and normative barriers (such as the use of language, the design of assembly spaces, etc.) between people with functional diversity and the empowering dynamics taking place in the squares. Indeed, these commissions created a space for mutual reflection on how discrimination against people with functional diversity affected us all (seeking to politicise the multiple experiences and the many specific problems most people were suffering because of the weakness of social policies, the role of charity, and the biomedical-rehabilitative grounds of the policies and institutions addressing dependency issues in Spain); and stressed the important contribution of functional diversity in the production of more accessible and inclusive ‘cultures of anyone’ (cf. Moreno-Caballud 2015).

The beginnings of this alternative way of thinking and arranging independent living originated at this very unusual crossroads. As many activists themselves recognise, it is in this complex and unpredictable confluence where new and fruitful combinations began to take place: where the values of hacker culture and open design practices intermingled with the self-care philosophy of the Independent-Living movement. It is in and around the 15M movement that making and self-care, innovation and independent living, collaboration and accessibility, free knowledge and DIY technical aids started to merge as practices combining in new and creative ways. ETS itself is, perhaps, the best example of this.

The ETS project originated as a direct response to these events. Early members were invited to take part in Medialab-Prado Madrid’s Funcionamientos (‘Functionings’) workshops, that sought to host group and individual projects co-producing or experimenting with the ‘open design’ of objects infused with the philosophy of functional diversity. ETS was one of the six projects accepted. These workshops took place following several seminars and lectures on what those involved called ‘technologies of diversity’, hosted at Medialab-Prado (a cultural hub of Madrid City Hall’s Area of Arts and Culture) between the winter of 2012 and the spring of 2013 with the aim of 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’.
This was a great chance to reinforce some of the practices and methods learned, tested and shared in the squares of the 15M. Accordingly, ETS had the opportunity to design three small objects (Antonio’s armrest/briefcase was one, along with a folding table and a portable wheelchair ramp) that might become a freely licensed ‘wheelchair kit’ to encourage other possible interactions with technical and social environments: that is, acting, reflecting, and intervening in them to habilitate or to empower not only the user but also his or her ‘alliances’. To say this differently, the main idea of the project was not to integrate or to include the excluded individuals, but to dismantle the spatial conditions that prevented all of them from becoming friends. Indeed, the collective’s name, ETS, sought to encapsulate this thinking in Spanish: the idea for the project was to situate en torno (around) the silla (wheelchair) to reflect on its entorno (environment, surroundings).

This is how ETS materialised its commitment to breaking the vicious cycle of functional diversity’s ‘non‐presence’ in public spaces; rethinking the wheelchair as a ‘little agora that brings together not only the user but also the other people with whom the user interacts, be it at home, in the streets, bars, classrooms, wherever the people are’. The more people are involved, the less insulated the user is. The more significant a role is given to the agora, the less significant is the role given to ‘the market’. ETS thus sets in motion a way to design and make technical aids through co-authored solutions, which, apart from serving the needs of the wheelchair user, can have a much wider impact by enabling alliances not provided for or conceived of by available social and technical scripts.

11.3 Opening up space for a briefcase, unleashing the wheelchair’s possibilities

Returning to Antonio’s comments at the beginning of the chapter on the restricted forms of agency and empowerment that some technical aids allow, we will now describe one of the particular developments that ETS engaged in as a collective during the months before Antonio decided to change his wheelchair. ETS’s proposal for Medialab‐Prado included an armrest/briefcase, which entailed opening up a space in the wheelchair for storage by modifying or substituting some parts of the equipment. Why? Well, the reasons for this are clear to anyone who has spent a day out, had a coffee or walked with a friend or colleague who uses a wheelchair…

Regular powered wheelchairs, despite the many efforts to make them more comfortable and easier to steer accurately (Woods and Watson 2003), appear to be conceived mainly as self-contained gadgets for a sitting body in motion; this is how designers ‘figure’ (cf. Suchman 2012) wheelchair users. The wheelchair user is rarely viewed as someone who needs to buy and store belongings safely; or as someone who needs to keep a wallet and the keys to an apartment safe, not to mention someone who might want to carry make-up, perfume, a spare pullover in case the evening gets chilly, or plastic glasses and straws to drink water on a nice sunny terrace by a beach in Barcelona; or, even, as someone requiring particular hygiene products, such as urine bag replacements or other appliances many powered wheelchair users need. In short, wheelchairs are not understood in relation to their actual users, who are living and breathing beings dwelling in urban spaces (Mortenson et al. 2015).

To circumvent this design problem, the wheelchair users we know have usually developed two ‘little arrangements’ (cf. López 2015): (1) backpacks fastened to the rear handlebar; (2) lighter handbags with straps tied around the joystick or armrest. These are very inconvenient, however, being not only easy targets for pickpockets, but also causing other problems: handbag straps are often loosely secured and likely to fall off; backpacks, while usually well-secured when moving, can cause social embarrassment for many users – who want to remain anonymous, unnoticed, regular citizens – because to reach the backpack and its contents they require someone’s help. Whether this is a trusted personal assistant, a prying relative or an unknown bystander, other people are needed either to hand the bag to the user, or search through their personal belongings, as often happens, for instance, when paying in a coffee shop.

To Alida, Antonio and Rai, who met on an everyday basis during the Barcelona 15M protests in 2011, it was clear that something had to be done about this. How to take care of the issue through design interventions? The main idea was to create a hack or a permanent gadget that might unleash the empowering possibilities of the wheelchair and create conditions for new relations between the person in the wheelchair and the everyday environment. It was also important to combine functionality and autonomy for Antonio with aesthetic considerations: the collective wanted to produce something that would single him out, not as a ‘person in need’, but as someone with a ‘cool’ and ‘inviting’ gadget.

Having considered their options for the Funcionamientos’s Medialab-Prado kit proposal, ETS presented an armrest/briefcase (see Figure 11.1), which included the following features:
1. An ‘anti-slip cover’ to keep Antonio’s smartphone secure, even when travelling at high-speed.
2. An inside ‘tray with compartments and a cover’ to store cash, keys and cards.
3. A ‘storage space for a tablet, a phone charger, plastic glasses, a notepad, and hygiene products’.

By mid-October 2012, Medialab-Prado had not only approved the project but also provided a modest budget to cover materials for a prototype, which were to be presented, discussed and enhanced at workshops with mentors and regular users of the Medialab-Prado open space in Madrid in December 2012 and January 2013. A week later, Tomás – by then an ethnographer interested in exploring and analysing participatory care technology design – had joined the group at Antonio’s house in Barcelona. The first meetings he attended were devoted to taking measurements of Antonio’s wheelchair.¹⁰

¹⁰See https://entornoalasilla.wordpress.com/2013/01/13/replanteo/ (accessed 9 May 2016).
disassembling some of the parts – such as the armrest – and studying Antonio’s position in the wheelchair at great length. Alida and Rai noticed Antonio’s chest was leaning slightly to one side and that to sit comfortably he had to grab the left handlebar. Later, Alida and Rai also paid close attention to how Antonio moved his hands: he used the little finger knuckle of his right hand to operate his smartphone, and could move his arm laterally. Then, Alida and Rai drew sketches and diagrams based on these measurements.

Antonio was in no way treated as an object, but continuously contributed with many useful comments and added many nuances. As Tomás witnessed when he began taking pictures and notes, everyone collaborated during this informal process, sharing documents, a Dropbox folder, pictures, field-notes and minutes of meetings. Slowly but surely, what was intended as a single case study for him was turning into a passionate ethnographic and activist involvement with the collective.

Each meeting prior to, in between and after the December 2012 and January 2013 workshops in Madrid usually involved a discussion about the three elements of the kit in development. But ETS’s main efforts were devoted mostly to the design and production of the portable wheelchair ramp and the briefcase. The third element, a folding table, although conceived as being attached to the briefcase, was also thought of as an independent technical challenge. Later, at the second workshop in Madrid, Tomás started to curate the blog and open documentation of the project’s endeavours.11

The prototype of the briefcase that would replace the wheelchair’s armrest was initially created as a rectangular cardboard 1:1 model with a lateral opening cover. Fortunately, given that this was a low-budget hack, the armrest was designed for easy removal – often necessary for moving the user between bed and chair – meaning there was no need to heavily interfere with or alter other aspects of the wheelchair’s structure. Also, the fastening that attached the armrest to the chair could be employed as the main support for the new gadget. The cardboard model, despite being very basic, was extremely useful for sketching, demonstrating and testing (cf. Yaneva 2005) different ideas for the briefcase.

Alida, Rai and Antonio spent many afternoons in November 2012 exploring the project in a dialogic fashion, discussing methods for opening, closing and fastening the briefcase, convenient positions for Antonio’s smartphone and, when they realised that the joystick was attached to the armrest they were replacing, how and where to locate it in the new gadget. On most of those occasions, pictures

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were taken, notes and minutes were made, and many boundaries, zones and marks were drawn on the surface of the cardboard model, which also acted as a useful record of the meetings. Having double-checked with Antonio many times the right configuration and position of the gadget, Rai and Alida prepared a 1:1 plywood model of the briefcase structure (see Figure 11.2), including an L-shaped aluminium piece for the joystick bracket and a removable cover with a handle, which was not used in the finished prototype but served as a way of exploring lateral opening methods with Antonio. This plywood model was then presented and discussed at the first Medialab-Prado workshop.

On returning to Barcelona, the main solution for the briefcase emerged in attempts to recycle materials and ideas that had already been developed. This involved creating an iron structure, which was firm and covered on the side facing Antonio’s body as well as empty and open on the other side, where a bag made of cloth and felt could be inserted. Having agreed on the aesthetic specifications and measurements with Antonio, Alida and Rai commissioned an ironsmith to create the ‘chassis’, and, after producing a 1:1 model of the inner bag from recycled paper, appointed a tailor. Once these were ready, the chassis was covered with anti-rust orange paint and the collective met at the home of Pepe and Urbana – friends from the 15M – a few days before going to the January 2013 workshop. Making use of Pepe’s
home DIY workshop and Urbana’s tailoring skills, the group installed the new pieces on Antonio’s wheelchair; some worked at attaching the bag to the iron chassis and plywood cover (see Figure 11.3), others on the metal fastening for the chassis.

Pepe needed to adapt the crucial piece that would serve as a meeting point between the briefcase’s chassis and the wheelchair’s structure. Later, the most complex aspects requiring testing were: drilling the chassis and fixing an L-shaped piece of galvanised aluminium to re-attach the joystick to the chassis, and cutting and welding a tube and iron sheet to hold the briefcase in the requisite position, so that the tube would fit into the wheelchair’s former armrest fastening using a wing nut. All of these actions involved recurrent measuring and testing of different temporary versions with Antonio before the final gadget was produced.

This working prototype was taken to Madrid the day after, but was not installed on Antonio’s wheelchair as some adjustments were still required. At the final presentation of results, where the kit pieces were displayed, ETS opened up a line of inquiry that had been discussed during testing: the need to reflect on financial stability under the present precarious conditions, and how to ensure fair remuneration.

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12See https://entornoalasilla.wordpress.com/2013/01/30/presentacion-de-resultados-en-el-taller-final-de-funcionamientos-20-01-2013/ (accessed 9 May 2016).
in projects that engage in the open design of technical aids, most of which entail significant work and should therefore not rely solely on volunteer labour.

The months following the Medialab-Prado workshop were less intensive, but the group met regularly to finish the rest of the proposed kit. This was seen as marking a new phase for the collective, which entailed: (1) reflecting on the experiences of the group in the past months; (2) developing, with available resources, the prototypes into what could be considered functional and safe pieces of equipment, meaning that these could be used without requiring a great deal of maintenance (indeed, the finished briefcase was finally installed in Antonio’s wheelchair around February 2013) (see Figure 11.4); and (3) experimenting with the blog on how to document the process using open-access strategies and different media formats.

This final aspect was developed once the group had more time for reflection. Not only did they begin to explore modes of archiving the pictures, sketches and the many ideas that had been gathered, but they also started playing with potential uses of the blog and open documentation formats. To this end, in March 2013, Antonio, Alida and Tomás used a professional camera to shoot a video,13 re-enacting the process of taking out the armrest and installing the briefcase, as well as a demonstration of the new gadget in use. The video closed with Alida asking Antonio how he felt: ‘This is going to be brilliant!’ he

Figure 11.4  The final armrest briefcase. Image CC BY NC by En torno a la silla (taken in March 2013, published on April 5 2013), used with permission. Image taken from https://entornoalasilla.wordpress.com/2013/02/06/maleta-y-mesa/ (accessed 9 May 2016).

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13See https://www.youtube.com/watch?v=czHsrlDJvqU (accessed 9 May 2016).
replied, trying out the lateral opening of the briefcase, ‘All I need is a little bit of practice’. Alida later made exhaustive drawings of the process, and, together with Tomás, created their first downloadable ‘tutorial’, which contained a technical summary of the process and the materials as well as design proposals to share with others in order to inspire them to start similar projects: ‘The piece attaching the chassis to the wheelchair is very important; it is a generic piece, which means that briefcases with different designs can be compatible with different wheelchair models’ (our translation).14

11.4 Radicalising design through small object interventions: care as ‘joint problem-making’?

In May 2014, Alida was invited to present her work and that of ETS at a conference in Medialab-Prado, called Madrid Urban Laboratory. In providing some context for the collective’s endeavours, she explained that she had previously worked as an architect designing houses and interiors and had engaged in challenging projects involving accessible housing. With ETS, however, she found that despite her long activist trajectory as a member of several collectives, ‘[…] for the first time, I have joined a political space as an architect’.15 In saying this, however, there was no attempt on her part to portray her involvement as a benevolent gesture, engaging in a process that is only political for the designer, a process where she was the one defining goals and methods, as is the case in many ‘token’ or ‘placatory’ and rarely ‘transformative’ (cf. Till 2005) forms of participatory design, where users are only engaged so that designers can gather information to improve their own designs (Asaro 2000: 264), or to increase the acceptability of already designed solutions.

As Alida stated at that meeting, in ETS there was a clear attempt to create a more ‘revolutionary’ engagement with the desires of the users (cf. Petrescu 2005), in line with previous design explorations in the Independent-Living movement, coining the motto, Nothing about us without us (see Lifchez and Winslow 1979; Werner 1998) – in which the issues at hand and the skills for tackling them are communal. Or, in Alida’s words:


[...] we always work [in ETS] focusing on the concrete needs of singular bodies that very often have very articulate, accurate, and very well-defined design requirements... and with these objects we are in search of a satisfactory result [...] to create [alternative] possibilities of relating to the environment.16

Building on these ideas, this section engages with STS and design literature to demonstrate how ETS’s briefcase project and its re-articulation of designer/user asymmetries present a ‘careful’ mode of designing technical aids. However, we also need to qualify this claim by noting that although care has been politicised through feminist struggles in an effort to support our fragile existence with more just, equally distributed and sustainable relations, for Disability Studies and the Independent-Living movement ‘care’ has become a tension-laden topic, taken as an expression of the modes of disablement, dependence, institutionalisation and expert-driven practices that they have sought to challenge (Shakespeare 2006; Winance 2010; Oliver 2013). In the Spanish context, these tensions were worked through in the alliance forged by the Independent-Living Forum and several feminist collectives, whose meetings and debates were transcribed and published in the book Cojos y precarias haciendo vidas que importan (Crips and Precarious Women Making Lives that Matter) (Foro de Vida Independiente and Agencia de Asuntos Precarios 2011). This debate brought to the fore the clash of ideas surrounding self-care and interdependence: where one side viewed the role of personal assistance as a figure of empowerment, the other worried it might become a potentially dangerous and more invisible form of care-work, merely reversing the power asymmetries between the former subjects and objects of care.

Our take on ‘care’ and its relation to design derives from a branch of literature in STS that has sought to open space for a broader range of actors (for instance, menders, see Callén and Sánchez Criado 2015) and thereby expand the notion of care to include our everyday lives with diverse materials. This move entails an analytic shift towards thinking in terms of ‘care arrangements’ (López 2015; López and Sánchez Criado 2015), where care is not only seen from a bodywork perspective – that is, the usually invisible physical labour that care-giving entails – but from a broader perspective considering socio-material arrangements: that is, where care-work appears as distributed amongst people and things and where ‘delegations’ (cf. Latour 1992)

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of tasks to things are also noted. This move in the understanding of care from bodywork to arrangements also foregrounds the socio-material orders therein being enacted (Denis and Pontille 2015).

This has created space for interwoven concerns about the meanings of care in STS: (1) an interest in understanding the production of ‘the good in practice’ enabled by these arrangements, where care is shaped in different modes of experimenting and *tinkering* with how we might live better together (Mol et al. 2010); and (2) an attempt at mobilising care as a way to intervene in expert-driven practices in order to include those to whom nobody pays attention, those ‘weeded out’ or suffering from the consequences of particular techno-scientific arrangements, such as our wheelchair friends having to cope with the standardisation and commoditisation of technical aids (Martin et al. 2015). Indeed, in such multifarious reflections care is usually seen as ‘an affective state, a material vital doing and an ethico-political obligation’ (Puig de la Bellacasa 2011: 90).

We believe that the design practices of ETS bring together these concerns, not only by enabling a rethinking of good care arrangements in practice, but also by introducing a particular mode of politicising that can have a transformative impact on end users who often suffer from standardised design. Certainly, one way to understand the process of designing the briefcase would be to see it as a crucial and much needed political intervention in the re-aestheticisation of technical aids (Pullin 2009) – altering the configuration of the wheelchair to make it less hospital-like – or seeking to go beyond a mere adjustment of the disabled body to the device (see Winance 2010) hence unleashing its tamed empowering possibilities. But however small and non-replicable such a move might seem, we contend that a more radical version of care through design can also be attributed to the practices of ETS.

The work of ETS is careful because of the transformation of the roles there enacted, and the constant attempts to work from the needs and embodied effects of each material transformation in Antonio’s life. The use of repeated iterations and dialogues using models convey the sense that ETS’s practices are a form of inclusive design, a democratising movement in personal and urban accessible technologies that ‘[…] is as much about processes as products, or about the social, attitudinal and institutional relations which underpin and shape the practices of professionals’ (Imrie and Hall 2001: 24). The officially recognised designers are no more designers than the users. A new distribution of roles is therefore executed, intervening in the ready-made distinction between experts and future end users, without abandoning the knowledge and skills of the parties involved (Till 2005).

Overall, these practices are careful because their collaborative design approach creates objects that do not only embody the expertise
of designers. Rather, the social and material explorations of ETS take the form of what we term ‘joint problem-making’, where small interventions into objects are not only a way of solving the problems that Antonio may face, but also – as is evident in the desire of the group to open up their process through documentation – a way of attempting ‘to problematize the situation’ (DiSalvo 2012: 103) of technical aid design. The tutorial, online documentation and presentations at Medialab-Prado all created conditions that transformed ETS into an ‘interrogative’ design collective (cf. Wodizcko 1999: 16–17), which reflected on the political, economic, and material conditions of the production of technical aids, as well as the problems involved in articulating new alternatives.

In doing this, ETS offers a ‘more radical’ approach to care, through the design of technical aids, than other attempts to produce democratic effects by design: that is, efforts to inscribe the democratic virtues of a participatory process into an object that is understood to be a solution (Lezaun 2013). We believe that the approach of ETS is more radical than, for instance, universal design, which often seeks to create enabling environments through providing technical solutions distributed as conventional market products (Imrie and Hall 2001: 17). And, as we saw at the beginning of the chapter, for that to happen, at the very least, access and choice over the design of these products would have to be improved.

But, let us clarify, by ‘more radical’ we refer to two interconnected moves: in ETS practices, care arrangements are politicised. More precisely, what is politicised is the very grounding of technical aid design, its distribution and material delegation of roles and modes of knowledge. This is done by placing them under examination through design practices. Referring to the etymological sense of the word, we can say they are more radical as they go to the ‘roots’ of care arrangements. Following the Latin etymology, radical comes from radix, or radish in late Old English, meaning ‘going to the origin, essential’.17 This is the meaning we seek to convey when we say that ETS practices are more radically ‘careful’: they entail forms of ‘joint problem-making’ (see also Till 2005: 31–35, and Petrescu 2005: 45 for similar arguments), where the purpose is to open up design issues and modes of response to all the involved parties; then experimenting together with how to re-materialise them; and, finally, making the relevant ways of learning what it might mean to create alternative material care arrangements available through open modes of documentation.

11.5 Concluding remarks: ‘joint problem-making’ as a careful design mode in post-austerity times?

In this chapter we have related the collaborative design of a particular object, a DIY briefcase for a wheelchair fabricated by the Barcelona-based activist design collective, *En torno a la silla* (ETS). In our attempt to produce a careful ethnographic reconstruction of the process our intention has been to show that the practices of this collective reveal a particularly interesting mode of caring through design we refer to as ‘joint problem-making’.

This entails: a radical approach to collaboration and an interest in sharing problems and skills between those are usually called designers and users; a way of politicising and opening up the foundations of technical aid design through small DIY design interventions that have enabled people to continue living more comfortably; creating interesting relations through the sharing of problems. Furthermore, we have attempted to delineate its origins and connections with the inventive methods and practices that brought together open design philosophies and the Independent-Living movement under harsh political and economic post-austerity measures in Spain.

As we see it, ‘joint problem-making’ plays a major role in outlining and experimenting with careful responses to the pressing needs and widespread insecurity that the current situation has created for our wheelchair-using friends. And austerity is far from over: its violent, painful effects are still among us, haunting us, day after day. There has been an unequal distribution of this pain and violence through society: not everyone has suffered the same, but it has touched us all. The harsh economic conditions have not only eroded what was already a meagre welfare state, but have also endangered each and every one of us, and continue to affect the long-term sustainability of any innovative and experimental mode of resistance that might have been attempted. It is unlikely that the situation is going to change magically in the forthcoming years. Austerity is the state we live in.

Antonio’s briefcase is a fragile design object requiring care, as are many of the devices designed by the collective. All these small interventions have required a major effort, and a wearying, continuous presence from ETS’s craftspeople to keep them functioning, to keep

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18 For the sake of brevity the implications of ‘joint problem-making’ for the research cannot be discussed here, but suffice it to say that it has given way to a programmatic exploration around new modes of doing research as ‘experimental collaborations’ (Sánchez Criado and Estalella, 2016). For more information, please check www.xcol.org (accessed 9 May 2016).
their relationships strong, to make real the joint political prospect of living together under conditions of bodily diversity. However, ETS is also a fragile response in itself. Certainly a fruitful outcome of a disastrous situation, like many other displays of creativity unearthed by the transformations and cracks in contemporary Spain’s economy and welfare state, the permanence of ETS is constantly under threat: its members have to deal with a budget-less horizon and put significant effort into keeping the project alive. The crucial question is therefore whether we will be able to invent – through many more ‘joint problem-making’ activities – the necessary conditions to enable careful experimentation with designing better ways of living together.

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