

A thesis submitted to the University of Trento for the  
degree of Doctor of Philosophy

**Processes in the formation of publics:  
A design case study on dyslexia**

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# Statement of Contribution

This thesis reports research principally done by the author, as a part of his doctoral research. The work presented in Chapter 4, 5, and 6 has been published as follows. Parts of these papers have been re-interpreted and rewritten in the thesis; some passages have been quoted verbatim.

The results of the fieldwork activities reported in Chapter 4 was published in part as:

Menéndez-Blanco, M., & De Angeli, A. (2016). “Matters of Concern” as Design Opportunities. In *COOP 2016: Proceedings of the 12th International Conference on the Design of Cooperative Systems*, 23-27 May 2016, Trento, Italy (pp. 277-293). Springer International Publishing.

The study of the event and physical artefacts reported in Chapter 5 was published in part as:

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The study of the digital platform reported in Chapter 5 and 6 has been submitted in part as:

Menendez-Blanco, M., De Angeli, A., & Teli, M. (2017). Biography of a Design Project through the Lens of a Facebook Page. *Computer Supported Cooperative Work (CSCW)*, 26(1-2), 71-96.



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## Abstract

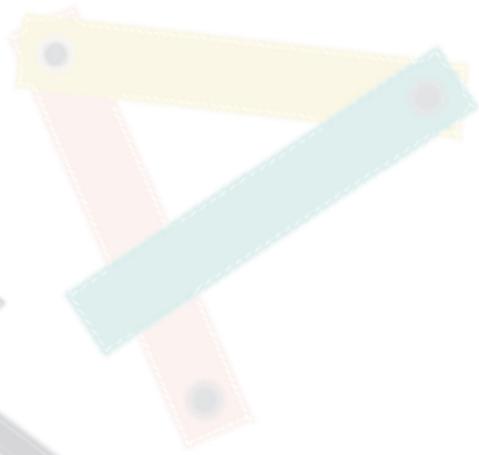
The work presented in this thesis is aligned with a renewed interest in design for opening new possibilities for democracy. This thesis builds on a growing corpus of research investigating the role of design in supporting the formation of publics. In this thesis, the concept of publics is aligned with Dewey's view, which refers to heterogeneous groups of people concerned about an issue who organize themselves to address it.

This thesis aims to contribute to this corpus of research by investigating the following research questions: *what design processes can contribute to the formation of publics?* and *what design interventions can enable these processes?* Answers to these questions are constructed by engaging in a practice-based design research of a case study of dyslexia in Trentino, a region in Italy where dyslexia is a controversial issue grounded not only in medical but also societal and political conditions.

The main contribution of the thesis is a method to support the formation of publics following a practice-based interaction design approach. This method proposes articulating, representing and reconfiguring as three intertwining and complementing processes that can support the formation of publics. In addition, it proposes that designing interventions on the basis of physical artefacts, digital platforms and events can enable people to act on an issue. Finally, it proposes programs for action as takeaways of design research projects that aim to enable people to act on societal issues.



# Chapter 4



CHAPTER 1

# 1. Introduction

This chapter presents the context and motivation of this work, introduces the research questions and contributions, and outlines the structure of the thesis.

## 1.1. Designing new possibilities for democracy

On March 2017, Victor Margolin and Ezio Manzini sent an open letter to the research community where they urged designers to “stand up for democracy”. The motivation for writing this letter referred to the increasing attacks on democracy, even in places where democratic values were used to be given for granted. Indeed, this was not only a letter, but a call for action for designers. The authors argued that designers had a role on the development of democratic processes. However, considering the difficult situation of democracy nowadays, designers needed to do more. Specifically, they urged designers to conceive “new possibilities for democracy” as a kind of “proactive resistance”.

Considering the current spread of digital technologies, interaction design becomes especially relevant as a source of new possibilities for democracy. In the last years, an increasing number of researchers have engaged into investigating different forms in which design can enable democratic forms of participation and the role that digital technologies can have on it. These efforts range from creating new digital technologies with disadvantaged communities (Le Dantec 2016), elaborating on the role of prototyping as a way to opening new forms of production in the making (Seravalli 2013a), exploring how design artefacts can articulate matters of concerns on issues of public interest (DiSalvo et al. 2014), and investigating ways in which participatory approaches can support more democratic ways of innovation (Björgvinsson et al. 2010). This thesis is aligned with these efforts

as it proposes a methodological contribution for interaction design to enable people concerned about an issue to act on it.

Following a practice-based design research approach, this work investigates the ways in which interaction design can support the formation of publics. To this end, this work elaborates on spazioD, a case study aiming to enable forms of inclusion in the Italian education system with a special focus on dyslexia. As part of this case study I have engaged into fieldwork, design and analysis activities. The social construction of dyslexia and the way in which involvement is shaped by assumptions among different actors makes the issue relevant for the purpose of this thesis.

This thesis aims to contribute to a practice-based design research program investigating ways in which interaction design can contribute to the formation of publics by proposing a method. This method proposes articulating, representing and reconfiguring as three intertwining and complementing processes that can support the formation of publics. In addition, it proposes that these processes can be enacted on the basis of physical artefacts, digital platforms and events. Finally, it suggests “programs for action” as takeaways of research programs that aim to support the formation of publics by providing inspiration on ways to act on an issue.

## **1.2. Research question and contribution**

This thesis aims to contribute to the existing corpus of research on how interaction design can facilitate the formation of publics by investigating the following the research question:

*RQ1: What design processes can contribute to the formation of publics?*

The main contribution of this thesis is the definition of a method following a practice-based interaction design approach for a research program to support the formation of publics. This method proposes articulating, representing and reconfiguring as three intertwining and complementing processes that can support the formation of publics.

Each of these processes has been discussed and elaborated in previous research (Björgvinsson et al. 2010; Le Dantec and DiSalvo 2013). The thesis brings them together through spazioD, a project that investigated ways in which interaction design can support the formation of publics. This project unfolded within the scope of the social construct of dyslexia and in the context of Trentino, a region in Italy.

The thesis proposes that the process of articulating aims at creating opportunities for exploring concerns and assumptions regarding people's engagement to issues (DiSalvo 2009; Le Dantec 2016) while revealing mediators. Mediators are people, or groups of people, who can gather together actors with conflicting views on a shared issue. They are paramount for the process of the formation of publics because they can enable future opportunities for exploring different and conflicting concerns. The process of representing aims at gathering people around issues while portraying those issues (Latour and Weibel 2005). Finally, the process of reconfiguring aims at supporting adoption and appropriation beyond the research program. Together with articulating and representing, these three processes compose the foundations for design to support the formation of publics.

*RQ2: What design interventions can enable these processes?*

The thesis proposes that designing interventions on the basis of physical artefacts, digital platforms and events can enable people to act on an issue. In addition, it contributes with an empirical case study which shows how these design interventions were enacted as

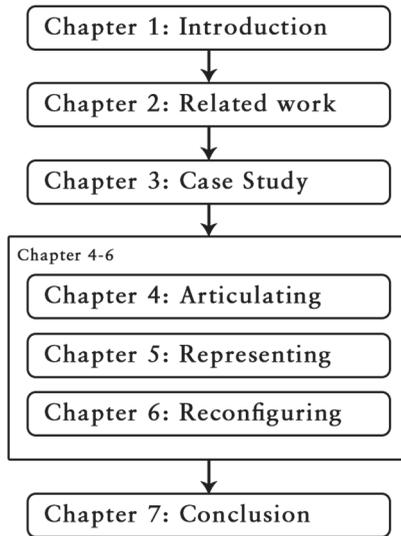
part of processes of articulation, representation and reconfiguration.

Even though these design interventions should be holistically approached; they differentiate in terms of the role they play in enabling the processes that support the formation of publics. Concretely, physical artefacts can specially contribute at raising questions, provoking reflection and enabling discussion on assumptions. The affordances of digital platforms can help connecting different people concerned about the same issue. Events can act as overarching interventions, sometime including physical artefacts and digital platforms, which can enable the emergence of discourse spaces where assemblies of people can engage into dialogs that address their disputes (Binder et al. 2011).

Finally, these design interventions can enable people to act on an issue beyond the concrete research framing through “programs for actions”. This thesis proposes programs for actions as takeaways (Koskinen et al. 2011; Redström 2011) of research programs investigating how interaction design can support the formation of publics. Programs for action are inspirational and easily personalised material that can guide people who want to act on an issue and thereby contribute to the formation of publics.

### **1.3. Outline of the thesis**

The thesis report is structured in seven chapters (Figure 1.1.) Chapters 2 and 3 introduce the theoretical foundation and the context in which the work presented in this thesis has been carried out. Chapters 4 to 6 report the three main processes around which this thesis is organised. Chapter 7 concludes with a discussion on the processes with respect to public formation.



**Figure 1.1** Structure of this thesis.

Chapter 2 introduces the theoretical foundations of this thesis. First, it elaborates on the evolution of research in HCI from a discipline dealing with the design of usable interfaces to a myriad of interdisciplinary research programmes investigating the relations between people and technology. Then, it elaborates on existing corpus of research which is relevant for investigating the way interaction design can support the formation of publics. In particular, it presents the notions of publics, Things and infrastructures and provides an overview of the recent corpus of research building on these notions as analytical lenses for design.

Chapter 3 presents the Italian research programme that has funded this work, elaborating on its framing with respect to the opportunities and challenges in the evolution of HCI. Then, it introduces our specific instance of this programme: spazioD, a project dealing with aspects of educational inclusion with respect to dyslexia. The relevance of dyslexia for the formation of publics is elaborated by presenting the general controversies surrounded

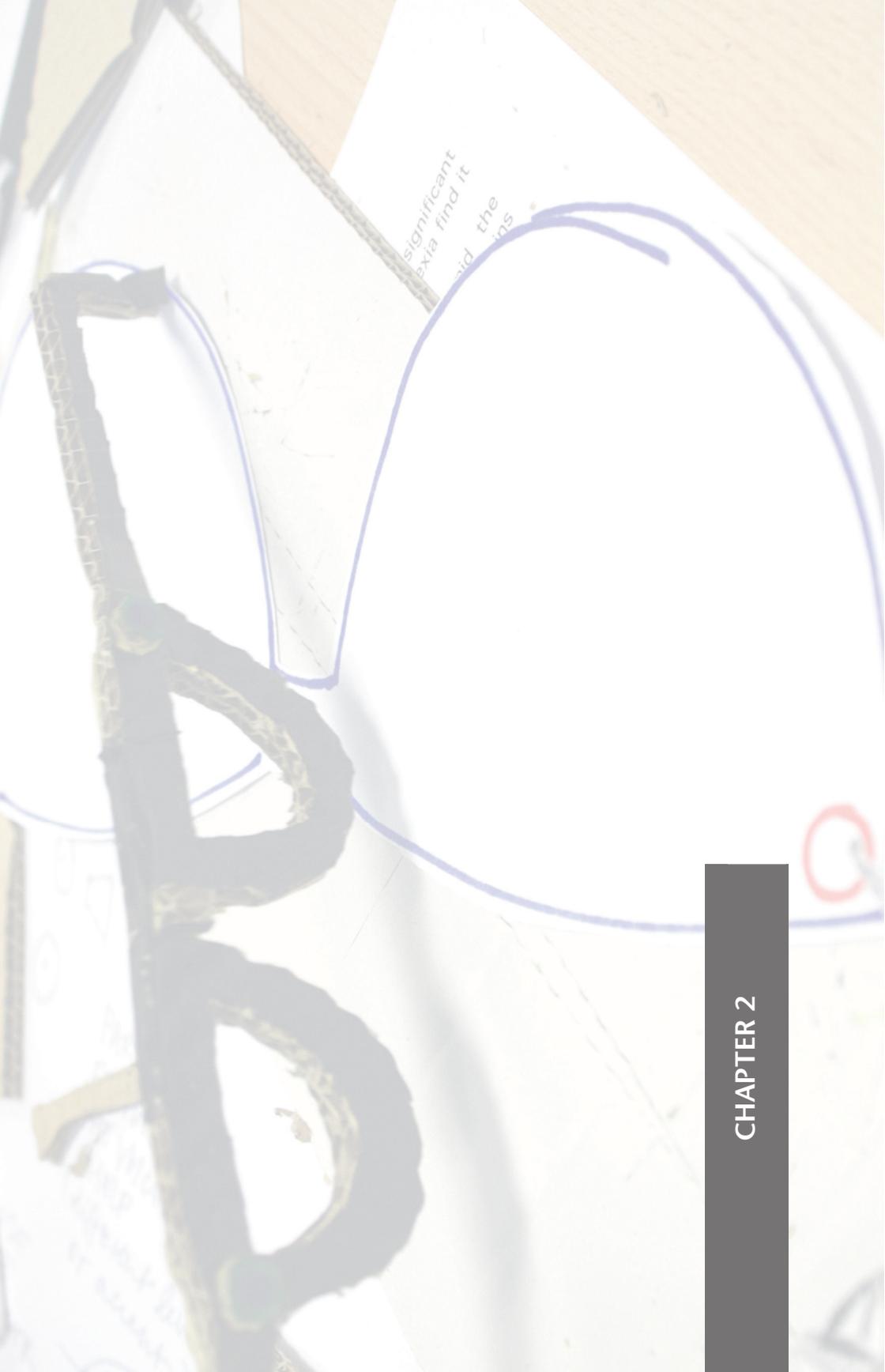
the issue of dyslexia and the local geo-political conditions. Finally, it elaborates on my motivations for engaging into this project.

Chapter 4 presents the first of the three processes around which this thesis is organised: articulating. In particular, it describes the results of the fieldwork which investigate existing opportunities for articulating concerns regarding dyslexia in Trentino. These activities contributed to three main outcomes: in the first place, they allowed us getting to know those involved in dyslexia in Trentino; secondly, they revealed the network of actors, their problematic relations and their interpretations regarding others' involvement; finally, they revealed their different views on dyslexia and articulated them in ways that inspired different forms of representations.

Chapter 5 elaborates on representing understood as a twofold process that brings relevant actors together and portrays issues through objects. In particular, this chapter elaborates on representations on the basis of events, physical artefacts and digital platforms. In addition, it introduces kind of critical design approach to enable representations by which prevailing narratives are challenged by alternative agendas based on shared commitments. These activities highlighted the importance of enabling representations that can travel across different social worlds and can support the emergence of a common field of work.

Chapter 6 focuses on reconfiguring as a process that provides the means for people to act. In particular, it describes new forms of involvement and social arrangements that emerged beyond the design project. In addition, it elaborates on the capabilities of events, physical artefacts and digital platforms to support different kinds of involvement and proposes strategies for supporting reconfiguring process in design projects.

Chapter 7 concludes discussing the three processes with respect to the formation of publics. In particular, it elaborates on articulating as a process that by reveals concerns, conflicts and shared commitments and opens up design opportunities. Representing as a process that supports the emergence of assemblies where people can discuss different points of view. Reconfiguring as process that supports the emergence of new forms of involvement and social arrangements.



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## CHAPTER 2

## 2. Related work

The work presented in this thesis is motivated by an increasing interest in investigating digital technologies within society. More specifically, this thesis is grounded on a growing corpus of research that investigates the way digital technologies can enable participation in democratic processes and how these processes can support the formation of publics. This thesis builds on and combines large part of the conceptual and theoretical concepts explored by this growing corpus of research. The three key guiding processes have been identified in the literature and refer to different stages of an infrastructuring effort. In particular, articulating refers to the process by which issues are articulated into matters of concern. Representing refers to the process by which people are gathered around a portrayed issue. Finally, reconfiguring refers to the process by which new forms of involvement are facilitated. The following sections discuss the existing literature organized around these three processes.

### 2.1. Evolution of HCI

Human Computer Interaction (HCI) emerged as a field during the 80s at the boundary between computer science and cognitive psychology in an attempt to embrace a human-centred approach that underlined the importance of considering human factors in the design of automated systems (Shneiderman 1980; Card et al. 1983). Large part of the work during this period were focused on the design and evaluation of user interfaces for the workplace. Most interactive technologies aimed at improving performance and the concept of usability was proposed with efficacy and efficiency as relevant performance metrics (Nielsen 1994). These concepts and metrics contributed to modelling humans as a set of factors that could be used to maximize performance by building upon information processing theories of cognitive science (Kuutti

1996). This view soon gave rise to several critical voices. They urged for a shift from the focus on studying people as objects to be modelled to investigating real systems within richer contexts (e.g. Bødker 1987; Bannon 1991; Kuutti 1996). This shift could not be pursued by different practices and methods but required the introduction of approaches beyond psychology such as social and behavioural sciences (Kuutti 1996). As Bannon argued, this shift meant that people might not longer be considered as “human factors” but rather as “human actors” in a specific context and with their individual values (Bannon 1991).

In the 90s, the object of inquiry shifted from the interface between people and computers to the “interspace” among people and different kinds of devices, as described in the essay by T. Winograd on “The design of interaction”:

*“The traditional idea of “interface” implies that we are focusing on two entities, the person and the machine, and on the space that lies between them. But beyond the interface, we operate in an “interspace” that is inhabited by multiple people, workstations, servers, and other devices in a complex web of interactions. In designing new systems and applications, we are not simply providing better tools for working with objects in a previously existing world. We are creating new worlds. Computer systems and software are becoming media for the creation of virtualities: the worlds in which users of the software perceive, act, and respond to experiences.” (Winograd 1997, 153)*

In this essay, Winograd predicted that the different kind of methods, skills, and techniques required to design in this interspace would produce a separation in the design of digital technology between those focused on the machinery and those focused on people, giving rise to a new field of interaction design focused on the design of computer mediated experiences (Winograd 1997). The quality of these experiences would not be only investigated in terms of ease of use but also in terms of their hedonic qualities. In particular, aesthetics, enjoyment and pleasure

were introduced as relevant metrics and composed within the operationalization of user experience (De Angeli et al. 2006; Hassenzahl and Tractinsky 2006). This focus on experiences led to investigating digital technologies as something we live in, as opposed to something we use (Bannon 2011). The focus on the quality of the experienced brought in a novel interest on qualitative methods and approaches such as ethnography and phenomenology, challenging the previous dominance of the cognitivist approach (Bannon 2011). The renewed interest in qualitative methods and the influence of Participatory Design (PD) contributed to the emergence of Computer Supported Collaborative Work (CSCW), which focused on investigating cooperative practices with the aim of designing collaborative technologies in work contexts such as offices and factories (Bannon 2011).

In the last few years, there has been an evolution of the object of inquiry from the interspace towards spaces where socio-political issues, heterogeneous groups of people, diverse contexts and digital technologies become entangled. It is important to notice that this evolution is not intended as a dismissal of what was there before. Instead, it entails an expanded interest on what represents an object of inquiry. From an operational perspective, this interest calls for updated methods, theories and practices that can embrace its complexity, and entails reflecting on whether “HCI” is still a suitable term (Bannon 2011).

In an attempt to describe what this shift is about, Susanne Bødker introduced the concept of a “third wave of HCI” in her influential keynote at NordiCHI 2006 (Bødker 2006). In her view, the spread of technology into everyday lives and culture implies the emergence of an ecology of artefacts (e.g. laptop, tablet, computer), which operates in different contexts (e.g. home, work, leisure time). However, she argued that design efforts within the third wave tend to focus on designing for individual experiences and limit interactions that can facilitate learning through

experience. Indeed, most research has focussed on emotional and aesthetic dimensions of non-purposeful technology and, while doing so, disregarded existing concepts and practices within PD and CSCW. One of the consequences is that designers might lose their commitment towards “users” while being busy designing provocative artistic statements (Bødker 2006). According to a sequel paper published ten years later, HCI research failed to address these challenges, highlighting the need for a renewed focus on developing “*open technological designs that invite participation*” which can contribute to reconfiguration of artefacts, meaning the processes by which people adapt, or tailor, the technology to their needs through participation (Bødker 2015).

From a different perspective, this evolution implies a strengthened focus of technology design on societal concerns. This is illustrated by an increasing interest on publics and collective action such as the empowerment of socially vulnerable groups (Björgvinsson et al. 2010; Le Dantec et al. 2010; Le Dantec 2016) and the collective measurement of environmental variables (DiSalvo et al. 2014). This growing interest represents the basis for the work presented in this thesis.

## 2.2. Articulating

The increasing engagement of interaction design with political and societal issues has brought a renewed interest on how design can contribute to the formation of publics. The following sections introduce STS concepts and methods that have been proposed as providing an analytical frame to elaborate on issues and public formation. In concrete, this section introduces different understandings of publics and elaborates on Dewey’s view since it is the one used in this work. Then, it describes concepts which help understand why people get involved in issues, emphasizing the concept of attachments. This concept is relevant for this thesis

because it suggests that involvement can change over time and might be mediated by other issues. Finally, it discusses different ways to facilitate involvement, focusing on the importance of bringing different people who care about an issue together, as in an “hybrid forums”.

### 2.2.1. The concept of Publics

There are many different understandings of the notion of publics. Those of Lippmann and Dewey are especially relevant to this thesis because of their implications for design. In the book *The phantom public*, (Lippmann 1927) argues that the concept of public with respect to democracy is an unattainable ideal. In general, he argued, citizens are not interested in, or have no knowledge about, public affairs and even if they had they would not be able to keep up with all of them. In this view, the public is an abstract assembly that does not have an opinion of its own and therefore an intellectual elite should deal with public affairs and democracy. This view dates back to that of the philosopher Kierkegaard, who in his book “The present age” described the public as an abstract “*phantom*” (Kierkegaard 1962, 35). He argued that the public is a mass composed of unreal individuals who cannot be made accountable of their actions and which is never united, yet it is understood as a whole, even if it is an abstract whole that can become the opposite and still be the same (Kierkegaard 1962).

Lippmann’s view on democracy being managed by an intellectual elite is very different from Dewey’s participatory democratic ideals, by which democracy is constructed through consultation and discussion on matters of social concern (Dewey 1927). In Dewey’s view publics are groups of people who are concerned about an issue and organize themselves to address it. In addition, publics are not exclusive to a particular social class or groups of people and can have different opinions on the same issue. As a consequence, there is no single public but a multiplicity of publics, which are often controversial and contested (Dewey 1927).

In spite of their radically different views on democracy, Lippmann and Dewey shared some commonalities. As argued by (Marres 2007), both characterized processes of democratic politics as involving practices of issue formation. This means that they shared an understanding that people come together because they are concerned about an issue, as described by Lippmann:

*“The public in respect to a railroad strike might be the farmers whom the railroad serves; the public in respect to an agricultural tariff might include the very railroad men who were on strike. The public is not, as I see it, a fixed body of individuals. It is merely those persons who are interested in an affair and can affect it only by supporting or opposing the actors” (Lippmann 1927, 67)*

In addition, they shared a critical view on communication media, such as the radio and the press, and its management of public opinion. More specifically, Lippmann, who worked as a journalist, argued that mass media often provided only partial facts which manipulated the public with stereotypes and propaganda (Lippmann 1927). Similarly, Dewey argued that the way media collected and presented what was happening in the world tended to focus on often sensational and trivial pieces of news and disregarded its context and consequences (Dewey 1927).

This thesis builds upon Dewey’s definition of publics and participatory democratic ideals while exploring Lippmann and Dewey’s commonalities regarding the relevance of issues in public formation and their critical view on media. Zooming into the relevance of issues to public formation, the following section introduces concepts that help accounting public involvement in issues.

### **2.2.2. Investigating public involvement in issues**

The processes by which people become involved with issues have been the object of research by many scholars, especially in the

Political Sciences and STS (e.g. McCarthy and Zald 1977; Entman 1993; Marres 2007). Although people generally get involved in issues because they are interested in them, there are aspects that can influence their involvement, such as the “framing” of the issues. The concept of framing had been present for a long time in Social Sciences and Humanities, it first was defined by Entman (1993) who described the action of framing as “*to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation*” (Entman 1993, 53).

As argued by (Benford 1997), a problem with frames is that they are static, unlike the motivations for people to get involved into an issue frames are limited for investigating how people become engaged in collective actions because their immutability overlooks the dynamic processes by which people’s involvement in issues are socially constructed, contested, or transformed (Benford 1997). Another problem with frames is that selecting certain aspects of an issue can prevent the emergence of concerns located outside their prevalent narrative (Marres 2007).

As an alternative lens to look at the ways people get involved in issues, Noortje Marres (2007) proposed the concept of “attachments”. In particular, she argued that actors’ involvement in an issue is mediated through attachments that, unlike frames, can change over time and might not directly relate to a particular issue. She illustrates the relevance of attachments with an example on an issue of xenotransplantation—the process of transplanting organs or tissues between members of different species—where laypeople got involved with the issue not because they were directly interested in it but because they were concerned about how it could affect their personal relations. Looking through the lenses of attachments, people’s involvement in issues can be based on dependencies and commitments (Marres 2007). This distinction brings to the foreground that aspects of accountability

and dedication come into play when accounting for people's involvement in issues.

The relevance of attachments as analytical lens for interaction design has been mainly investigated by the work of Christopher A. Le Dantec (Le Dantec et al. 2010; Le Dantec 2012; Le Dantec and DiSalvo 2013; Le Dantec 2016), who has elaborated on the role of shared attachments as “*the bonding agent, cohering the plural experiences of shared conditions into a public*” (Le Dantec 2016, 61), emphasising the affective bonds that shape people's involvement in issues and investigating the role that interactive systems might have in mediating participation.

### **2.2.3. Enabling public involvement in issues**

In Latour's view, processes of articulation can be enabled within a space where different competences ranging from science, ethics, and law, come together taking the form of “ecological politics” (Latour 2007). The importance of bringing heterogeneous groups into articulating a particular public issue has been identified by several scholars. An example can be found in the book *Acting in an uncertain world* (Callon 2009). This book presents the concept of “hybrid forums”, which are processes that include deliberative activities during which heterogeneous actors—experts, politicians, officials—collectively define problems in which they are implicated (Callon 2009). Although deliberation contributes to defining and constructing issues, it might not be sufficient to account for forms of addressing an issue.

Several pragmatic approaches have tried to contribute with procedures to facilitate the involvement of publics into the articulation of issues. As an illustrative example, (Gomart and Hajer 2003) highlighted the importance of organizing interventions in various locations and settings, from formal

consultations to outdoor events. In their view, these multiple interventions contribute to shifting the “staging of the affair”, which is important because it supports the emergence of multiple articulations of an issue, thereby contributing to inclusivity and accountability that are fundamental characteristic of democratic processes. Therefore, shifting the staging of the affair helps ensure that all legitimate actors are represented when debating an issue.

However, according to Latour and Weibel (2005), representing an issue does not only entail ensuring that relevant actors are present in an intervention but also that the issues are adequately portrayed in those interventions. In an attempt to exemplify the way issues can be portrayed, they engaged into a series of experiments that explored the role that objects can have in portraying issues and, by doing so, challenged designers to also engage into this endeavour (Binder et al. 2011). Indeed, design can complement as a generative device to the analytical frame provided by STS concepts and methods (DiSalvo et al. 2014).

### **2.3. Representing**

This section focuses on concepts that help understand ways in which issues can be represented. In concrete, it describes that representing issues entails enabling the means for gathering people around an issue and depicting the issue. In this thesis, these gatherings are conceptualised in the form of Things, which are assemblies of people and objects where issues are addressed and decisions are made. Regarding the ways of depicting issues, this thesis builds on critical design as an approach which helps creating representations of issues that raise questions and challenge prevalent narratives.

#### **2.3.1. The notion of Things**

In 2005, Latour and Weibel organized an exhibition on “Making Things Public” as an attempt to explore ways in which political

and societal issues could become matters of concern (Latour and Weibel 2005). The essay introduced the notion of “*Dingpolitik*” – or “Object-oriented-politics” which refers to the etymological roots of the word Ding – or Thing- in Nordic and Germanic cultures, where it was used to describe particular governing assemblies of objects and people where issues were addressed and political decisions were made (Latour and Weibel 2005).

The theories and concepts behind the exhibition were elaborated in an accompanying paper which discussed three different kinds of representations—political, scientific and artistic—and elaborated on how the first two could be assessed (Latour and Weibel 2005). The first kind of representation refers to representations as they are usually taught in political and law schools meaning establishing “*the ways to gather the legitimate people around some issue*” (Latour and Weibel 2005, 7). The assessment of this representation could be done in terms of how faithfully the right procedures for gathering people had been followed (Latour and Weibel 2005).

The second kind refers to a scientific way of representation, and it is meant as the ways in which an issue is portrayed to the people gathered around it. In this case a representation could be considered good “*if the matters at hand have been accurately portrayed*” (Latour and Weibel 2005, 6). Finally, the artistic way refers to the physical representation of issues, for example, in an exhibition. Indeed, in Latour’s view, exhibitions can enable representations of issues through gatherings—referring to Heidegger—and hybrid forums (Callon 2009). Moreover, an important aspect of exhibitions is that they constitute opportunities for gathering people who are concerned about an issue and, maybe more importantly, those people who are not concerned (Latour and Weibel 2005). They also underlined that these exhibitions are not reserved to museums; instead, they

argued that mundane sites such as supermarkets and medical establishments also offer unique opportunities to enable gatherings and hybrid forums.

In summary, object-oriented-politics can be understood as a call for exploring ways of representing people by, for example, enabling gatherings and creating objects that represent concerns.

### **2.3.2. Assembling Things through design**

The notion of Things has been proposed as a way to conceptualise the object of design (Binder et al. 2012), giving rise to questions such as what it means to design Things (Binder et al. 2011); how designing Things can express matters of concern (DiSalvo et al. 2014) and which strategies can make Things public (Ehn 2008; Björgvinsson et al. 2010).

These questions open up challenges regarding what type of practices and processes can be used not only for constructing products and devices but also for engaging with socio-material assemblies that deal with matters of concern (Björgvinsson et al. 2010; Binder et al. 2012). This highlights the double nature of Things: on the one hand Things are “objectified”, meaning that they are entities of matter such as products and devices; on the other hand they are “experienced”, meaning that they it can become a matter of concern as part of the socio-material assembly (Binder et al. 2011).

This double nature adds agency to Things and brings to the foreground the importance of inquiring the agency of humans and non-humans (Ehn 2008). In the context of HCI, Jenkins et al. (2016) elaborated on the agencies of digital artefacts and computation. They argued that a difference between physical and digital artefacts is that agencies of computation can be rather obscure since, even if the changes and effect are visible, their underlying basis are often unintelligible. In addition, they argued that artefacts do not exist in isolation but they interconnect people,

objects, values and contexts in what they referred to as “object ecology”, highlighting the role of design as generative device for creating these ecologies.

The agency of computing in connecting people is the object of inquiry of an increasing corpus of research. For example, Crivellano et al. (2014) investigated how the interactions in a Facebook page facilitated the emergence of a group of people with a political agenda. They found that the affordances of Facebook changed the ways people organised themselves around the issue of concern. Similarly, building on the study of digitally-enabled social movements, Bennet and Segerberg (2012) proposed two types of organizational structures: collective and connective action. They argued that both structures support action formation; however, they differ in their organizational logic. In concrete, collective action is organised around established ways of enacting action and is usually led by organizations such as NGOs. In this case, digital media is used to “create networks, structure activities and communicate their views to the world” (Bennett and Segerberg 2012, 749).

Differently, connective action is enacted by self-organised groups, such as “los indignados” and the “Arab Spring”. This kind of actions are usually flexible, diverse and inclusive to different individual forms of expression. Indeed, a distinguishing characteristic of connective action are “personal action frames”, which are individual ways of engaging with the matter at stake as a form of personal expression. Personal action frames are easy to personalise, such as meme images or themed messages, and might result in viral transmissions. Bennet and Segerberger’s argument is that this kind of actions are strongly influenced by the affordances of digital media in such a way that they fundamentally change the action dynamics.

Finally, they argued, there is a third form of hybrid “organizationally enabled connective action” which sits on a continuum between collective and connective actions. In hybrid actions, conventional organizations operate in the background but step back from projecting strong agendas to enable engagement around personalized action frames (Bennett and Segerberg 2012). As it will be discussed in the following chapters, these forms of hybrid actions and the role that digital media affordances has on engagement serve as analytical lens to understand public involvement in spazioD.

### **2.3.3. Critical Design**

Critical design is an approach where propositions that subvert an established status quo are embedded into artefacts (Dunne 2008). Accordingly, critical design artefacts pursue stimulating reflection on political and societal issues through provocation and ambiguity with a “slight strangeness” (Bardzell et al. 2012). Provocation and ambiguity together with critical design’s focus on creating artefacts beyond consumer products and instrumental goals has placed many critical design artefacts at the edge of art and design (Bardzell and Bardzell 2013). In addition, due to its emphasis on design and implementation of artefacts, critical design is often referred to as an interventionist, or design through research, approach (Bardzell and Bardzell 2013).

Artefacts emerging from critical design activities take many different forms. They can be digital, physical, or a combination of these. Some artefacts do not involve technology, whereas others are entirely dependent on complex computational systems (DiSalvo 2012). The choice is usually grounded on the designer’s skills and interests.

An important aspect of critical design is the hegemony of the artefact. Elaborating on this aspect, some researchers suggest that critical designers should be encouraged to build on their “design

authorship” (Ferri et al. 2014). This means that artefacts of critical design should embody ideas that mainly arise from designer’s concern or curiosity and people are then invited to reflect, or act, on these concerns through the enactment of the artefacts (Ferri et al. 2014).

The view on critical design artefacts being mainly ideated by designers is in sharp contrast with mainstream interaction design methods that build on approaches and methodologies such as Participatory Design (PD) or User Centred Design (UCD). However, these mainstream methods might be limited when designing for public formation. More specifically, PD or UCD usually follow a kind of prescriptive design that states what should happen; however, design for public formation entails a kind of predictive design that helps articulate scenarios that depict possible futures (DiSalvo 2009) and, thereby, in this way enable the kind of representation that deals with portraying issues. However, critical design does not elaborate on the way it can address the kind of representation that deals with gathering people around an issue.

This issue has been addressed by Anna Seravalli (2013), who investigated the ways design activities and prototyping can facilitate moving beyond critique and towards bringing people together. Concretely, building on Latour’s concept of compositionism, she elaborated on prototypes as artefacts that can help collectively constructing alternatives, or prospects. In this respect, it is paramount to differentiate between composing, meaning that alternative prospects are generated; and tinkering, meaning that futures aligned with the current status quo are embedded into artefacts. Even though the boundaries between the two of them can be subtle, the capability of prospects to travel and become futures can help distinguishing them (Seravalli 2013b).

Design activities and artefacts can facilitate the opportunities for engagement by identifying these mutual dependencies, or other kinds of involvement, and providing the means for enabling them. For example, prototyping activities can help re-imagine new social arrangements and, through this process, objects can become arguments embedding alternative futures (Hillgren et al. 2011; Seravalli 2012).

## **2.4. Reconfiguring**

This section focuses on the concept of infrastructuring as a process that develops over time and space in a socio-material-technical context. Following this line of thinking, designing is described an infrastructuring activity that, through the performative staging of people and technology, can enable adoption and appropriation.

### **2.4.1. The notion of infrastructuring**

Infrastructuring has been regarded as a form of artful integration that unfolds through socio-technical processes that put different contexts into relation. The temporal dimension of infrastructures foregrounds the importance of considering the long-term evolution and continuity of unfolding infrastructures (Karasti and Baker 2004; Volkmar and Volker 2009). In general, infrastructuring is investigated as a process that moves forward. However, its strong focus on future orientations and the creation of new infrastructures tends to overlook the past, or the existing “installed base”, on which the infrastructure relies and which might be source of tensions (Karasti 2014).

Studying the process of infrastructuring entails exposing their invisible work (Star 1999) since infrastructures tend to remain unnoticed until there is a breakdown (Pipek and Wulf 2009). To reveal the invisible work of infrastructures requires studying them “*in the making*” (Bowker and Star 2000) and analysing the on-going processes and interrelated activities that develop over time

in “*multi-relational socio-material-technical contexts*” (Karasti and Syrjänen 2004). From this viewpoint, it is paramount to highlight the aspects that guarantee their functioning by focusing on the everyday working of the infrastructure (Bowker and Star 2000). Exposing the infrastructure’s inner workings as continuously growing components can be conceived as a way of studying the infrastructure’s biographies (Pollock and Williams 2010) which can help highlighting specific events that had a particular impact on the development of the infrastructure.

#### **2.4.2. Infrastructuring and publics**

In relation to public formation, infrastructuring can be considered as a continuous process that entangles and intertwines different design activities that facilitate the formation of socio-material assemblies around matters of concern (Björgvinsson et al. 2010). In this way, designing is not an iterative process including consecutive activities such as research, design, implementation and evaluation. On the contrary, these assemblies are constructed through “*design games*” which are performative staging of people and technology happening in a design process (Ehn 2008).

From a participatory design perspective, (Björgvinsson et al. 2010) elaborated on infrastructuring as an entanglement of “*a priori infrastructuring activities*”, “*everyday design activities in actual use*” and “*design in use*”. The notion of design in use is relevant in infrastructuring for public formation since it highlights the importance of enabling processes that facilitate adoption and appropriation beyond the initial design (Ehn 2008; Björgvinsson et al. 2010; Le Dantec 2016).

According to Ehn (2008), design in use can be facilitated through meta-design activities carried out along the design process. These meta-design activities can be pursued through strategies that can

help connect design games in design and use time. For example, a component strategy suggests building configurable infrastructures composed of multiple blocks that can be combined in different ways, connecting designers and users.

Another strategy is that of protocols, which are procedural agreements that provide general guidelines while allowing change and adaptability. To illustrate this point he refers to ‘basilica’ as an architectural protocol that indicates some required characteristics while leaving others open. Similarly, (Björgvinsson et al. 2010) suggested to identify practices that can enable opportunities for future design along the way through a continuous matchmaking process. Furthermore, (Seravalli 2012) elaborated organising events and long-term engagements as tactics that can help foster design in use and “*participatory making*”.

These practices do not only enable participation but also provide the means to facilitate the emergence of attachments and their evolution over time (Marres 2007; Le Dantec and DiSalvo 2013; Le Dantec 2016). Facilitating the emergence and evolution of attachments is important because it contributes to shaping new configurations among people and issues in a way that can leverage their agency to act on an issue:

*“With respect to infrastructuring, design is a purposeful act in which new sets of relations are created around issues and attachments – a reconfiguration of the network – aligning different contexts and enabling new abilities to act that simultaneously confront the issues as well as re-create them in recognizable and contestable forms.” (Le Dantec 2016, 86)*

The continuous process of reconfiguring through practice underlines the recursive aspects of public formation (Teli et al. 2015) and highlights the importance of enabling practices that can support the reinforcement of social structures. These reinforced social structures are important because they can influence relations and attachments and recursively prompt actions aimed at addressing the issue (Le Dantec 2016).

## 2.5. Conclusion

Nowadays, the pervasive and ubiquitous aspects of technology have contributed to an increasing corpus of research in HCI that engages with societal and political concerns within common spaces formed by dynamic entanglements of people, issues, contexts and technology. Engaging with these entanglements entails engaging with concepts and methods that acknowledge their complexity. Several scholars have found in the field of STS an analytical lens that can help in this undertaking while raising challenges and opportunities for design (Ehn 2008; Björgvinsson et al. 2010; Le Dantec 2016). Central to this thesis will be the challenge of how design can contribute to the formation of publics (DiSalvo 2009), where publics are understood under Dewey's interpretation: heterogeneous groups of people concerned about a shared issue and who mobilise themselves to address it. This thesis takes up this challenge by investigating kind of processes can that contribute to the formation of publics and how they can be enabled.

Even though publics assemble around issues, the existence of an issue is not enough for accounting its existence. Articulating issues as matters of concerns can contribute to exposing and supporting the emergence of attachments on which publics can be formed (Marres 2007; Le Dantec and DiSalvo 2013; Le Dantec 2016). Within HCI, existing research has explored the way artefacts can articulate issues as matters of concern (DiSalvo et al. 2014; Jenkins et al. 2016); this thesis will focus on how the articulation of matters of concern can contribute to the creation of artefacts that represent those concerns – thereby contributing to further articulating issues. To engage into this undertaking, two kinds of representing processes elaborated in (Latour and Weibel 2005) will be explored: representing as a process that refers both to bringing people together to discuss about an issue and to portraying an issue on an object.

Finally, the continuous entanglement of different design activities that bring together heterogeneous groups of people while engaging in articulating and representing issues can be considered part of an infrastructuring process. Infrastructuring does not only entail designing concrete artefacts or platforms but also, and more importantly for the formation of publics, supporting the emergence of future activities, or “design after use” (Ehn 2008; Björgvinsson et al. 2010). Adopting and appropriating have been highlighted as activities that characterise design after use. This thesis focuses on reconfiguring as a kind of design after use process, characterised not only by adapting or tailoring artefacts through participation (Bødker 2015), but also by the reinforcement of social arrangements which can support the formation of a public (Le Dantec 2016).



## CHAPTER 3

### 3. Case study

This chapter provides an overview of the context in which this research has been carried out and the personal reflection on my motivations for engaging into it. The issue addressed in this work is dyslexia. Unlike public issues such as global warming or political corruption, the reasons why dyslexia is a concern around which people want to gather might require further explanation. To this end, this chapter starts by elaborating on dyslexia as a social construct and then zooms into the concrete characteristics that constructs dyslexia as a concern in the context of Trentino, a region in Italy. Then it presents my motivations for engaging in this project by elaborating on previous projects and interests. Finally, it concludes with an overview of the geopolitical and academic context of Trentino and spazioD, the project under which the activities presented in this thesis have been undertaken.

#### 3.1. Context

##### 3.1.1. The dyslexia debate

In their book “The dyslexia debate”, Elliott and Grigorenko (2014) explain that dyslexia has been a source of controversy for a long time. These controversies are not only infused in research or educational settings but also in social and political contexts. In the first place, and though many experts agree that dyslexia relates to difficulties in decoding and/or producing written language, there is no generally agreed definition nor shared understanding of its nature and causes. This lack of consensus has fuelled some scepticism in educational contexts, which has permeated into social and political discussions. As an illustrative example, in 2009 a Member of the British Parliament claimed that dyslexia was a myth invented to excuse poor teaching in schools. (Elliott and Grigorenko 2014)

A main source of controversy is the operational definition of dyslexia. This definition describes dyslexia as a neurocognitive characteristic associated with literacy difficulties that cannot be explained by low intelligence, socio-economic disadvantage, poor schooling, sensory (auditory or visual) difficulty, emotional and behavioural difficulties, or severe neurological impairment that goes significantly beyond literacy and bases its operational definition by exclusion, meaning that all but one diagnostic criteria should be absent (Elliott and Grigorenko 2014). Moreover, the controversy is exacerbated by the arguable relevance of the criteria. For example, there are fundamental concerns about the operationalization and utility of intelligence measures in pedagogical interventions. Furthermore, there are strong correlations between school qualities, socio-economic variables, and emotional or behavioural difficulties.

In addition, the interpretation of these characteristics can be largely affected by contextual dependencies, which might partially explain the large variance in official percentages of occurrence among different countries, ranging from 5% to 20% (Elliott and Grigorenko 2014). Therefore, the issue of dyslexia opens discussions in cognitive, scholastic, social and political contexts. Specifically, the dyslexia debate is politically contested because a dyslexia “diagnosis” might discriminate between students who are entitled to special education provision and those who are not. Consequently, it highlights important implications related to educational policies, funding distribution and equal opportunities.

### **3.1.2. Dyslexia in Trentino**

At the time of the project, the attention towards dyslexia in Italy was recent. It had been triggered in 2010 by the introduction of the Law 170/2010, which for the first time regulated the provision of special education for dyslexic students, provided a set of criteria

to regulate “diagnosis” and mandated specific training for teachers. In addition, the law provided the creation of a Piano Educativo Personalizzato (PEP, Personalised Educational Plan in English). The goal of the PEP is to adapt the scholastic activities to each child based on their “cognitive profile”. Concretely, this cognitive profile refers to a document that represents children’s skills with respect to different categories—concentration, behaviour, automatization— highlighting weak and strong points. The PEP should be collaboratively created among the professionals that provided the diagnosis, teachers, and parents and renewed every year. Other professionals, such as educators and school’s special needs representatives might also participate. Finally, the law supported the provision of alternative teaching methods and computer technology to facilitate learning.

The Law 170/2010 was strongly embedded in a medical interpretation of dyslexia, which was described as a specific learning disorder. For this reason, people with dyslexia in Italy are referred to by the acronym DSA (the Italian for Specific Learning Disorder). Since the introduction of the law, the official percentage of dyslexic students in Italy has been slowly but steadily increasing. According to official data, the number of dyslexic students accounted for around 1% of the middle-school student population in the school year 2010-2011, rising to up to 4% in the school year 2014-2015 (Figure 3.1).

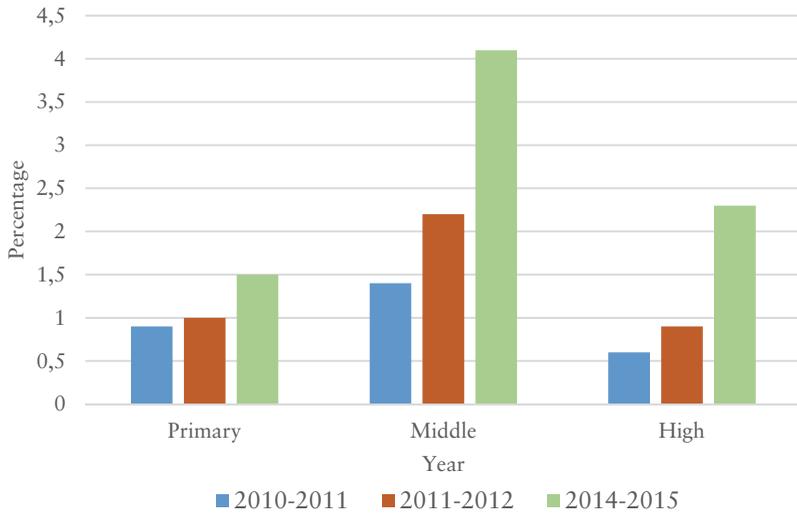


Figure 3.1 Percentages of dyslexia diagnoses in Italy per educational level.

In Trentino, the general controversies on dyslexia and the wider Italian context became intertwined with the local reality. More specifically, in 2012 the local government acquired the GiADA platform to be used in all schools in the region, which is usually referred as the GiADA project. This platform had been developed by Erickson, a company that performs a broad range of services in relation to special educational needs. In particular, Erickson—which was founded by two psychologists in 1984—undertakes research in psychological aspects of neurological conditions and provides consultancy and training services on domains such as dyslexia and other different ways of learning. In addition, it acts as book publisher and develops software for educational contexts, among which is the GiADA platform. As described in their website, this is a multimedia platform aimed at enabling early identification of conditions such as dyslexia; it does so by

providing tests for assessing learning skills and suggests educational material aimed at reinforcing children's capabilities.

In addition, the activities presented in this thesis occurred within a major public controversy against a new regional act of law mandating a Content and Language Integrated Learning (CLIL) methodology to be implemented in German and English, which is commonly described as the trilingual law. The act was part of a political program in the trans-border European region formed by Tyrol (Austria) and South Tyrol-Trentino (Italy). This methodology prescribes teaching a foreign language and a subject at the same time (e.g. teaching mathematics in German). The act became effective on September 2015 and encountered fierce resistance from teachers and parents. A significant source of controversy was the lack of consideration given to students with different ways of learning. Several public rallies and demonstrations were organized to call for a change in the act and to advocate for a more inclusive education.

### **3.1.3. Research context**

The activities presented in this thesis have been carried out in Trentino, a region in Northern Italy with an autonomous status, meaning that it enjoys a large degree of autonomy and jurisdiction over legislative, administrative and financial matters in different areas, including health, education and welfare. The capital of the region is Trento, a medium-sized city (115,000 inhabitants approximately). In spite of its relatively small size, there are several international and national Information and Communication Technologies (ICT) companies and institutions located in the region, with activities focusing on integrating digital technology into civic life. The city and local government therefore constitute a receptive environment for innovation; however, the emphasis of this process is often placed on the technological side (e.g. on the

development and testing of new systems) rather than on the societal, political or cultural aspects of such innovation.

The work presented in this thesis was carried out at the department of Information Engineering and Computer Science, which is the largest in the university in terms of people and projects. The interest of this projects is often on developing software systems and algorithms. In this context, design is predominately understood as a systematic approach to solve well-formed problems by searching for best solutions (Simon 1996). Many of these projects are developed in collaboration with the Fondazione Bruno Kessler (FBK), a regional research institute, and the national and international ICT companies.

Most of the activities presented in this thesis have been developed within the interAction Lab <sup>1</sup>. This research group has come into being in the last five years and at the time of writing this thesis was composed of 20 members. We come from different fields such as computer science, social sciences, anthropology, design and arts. The lab focuses on three main areas: public, inclusive, and aesthetic design. Even though these three areas are not meant to be considered in isolation as they overlap and intertwine in single projects, each of them provides a particular focus.

The area of public design refers to methods and practices for supporting collective action of different social groups. The work presented in this thesis has substantially contributed to discussion and reflection in this area. Inclusive design emerges from the desire to respect the rich heterogeneity of the population as a whole, the emphasis on dyslexia on this work has also triggered discussion in this area. The last one deals with practices and devices that address hedonic needs by engaging with and learning about the environment and the self. The activities presented in this thesis rely

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<sup>1</sup> <http://interaction.disi.unitn.it/>

on aesthetic and hedonic qualities of interactive artefacts as an aspect supporting engagement beyond the artefact.

At the interAction lab design is approached as an activity that entails constructing knowledge through a dialog with the materials of design. This approach is more common in design or architectural schools than engineering departments. The following section elaborates on this perspective and on the implications for the group.

### **3.2. Methodological considerations**

In this section I elaborate on the design perspective and methodological approach adopted in this thesis and discuss the influence of concepts and methods in the Social Sciences.

#### **3.2.1. Design perspective**

The design approach followed in this thesis is aligned with Schön's understanding of design as a method of inquiry that entails engaging in reflection on action. Following this line of thinking, Schön argued that designing means engaging with the messy and problematic situations in which design usually takes place. Designers engage with these problematic situations through iterative processes that combine "design moves", which are attempts to deal with an existing situation, followed by assessments of these moves. At the interAction lab these design moves are often collaborative efforts. Indeed, we often contribute to each other's projects: from brainstorming on conceptual design, to helping analyse data, and organising interventions. This collaborative approach together with our different backgrounds has contributed to a convivial and open minded research environment which help us embrace the messiness of design.

Embracing the messy situations in which design takes places means acknowledging that not all design problems are solvable problems,

but that some are wicked ones. The concept of wicked problem was introduced in the mid-1960 by Horst W.J. Rittel during a series of lectures and elaborated in a guest editorial by West Churchman (1967), who attended these lectures. Wicked problems were then defined as a “*class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing*” (Churchman 1967, 141).

In practical terms, acknowledging design as a process dealing with wicked entails acknowledging that problems have no definite formulation and therefore the same particular problem can have very different characteristics in different contexts and that controversies in relation to wicked problems can be explained in many different ways, and the choice of explanation determines the way problems are addressed (Rittel and Webber 1973). Consequently, wicked aspects of design are not inherent characteristics of design conditions but they result from how problems are constructed and enacted and are, thereby, influenced by the method of inquiry (Dorst 2006; Le Dantec 2016).

The perspective on design as an iterative process dealing with wicked problems instead of an activity aiming to solve problems has sometimes generated frictions with predominant approaches in the department. This has been especially visible in the qualifying exams, where members of the interAction lab have often faced difficulties justifying the scientific value of the method in the confront of systematic approaches. On the bright side, the department has largely acknowledged, and appreciated, our group’s compromise with engaging with the public. Indeed, in spite of being a relatively small group with respect to the entire department, we have substantially contributed to the department’s events on public engagement, and our projects – such as spazioD -

have been featured in the university's internal communication and press releases.

Indeed, as design research increasingly becomes part of doctoral studies, there is a need for methodological developments that allow integrating design and research (Vaughan 2017). Several methodological contributions try to provide guidance for design researchers to understand and justify their methodological choices. Practice-based design research and its focus on research programs (Koskinen et al. 2011) can help understand the methodological choices made in this work.

### **3.2.2. Methodological approach**

The work presented in this thesis engages with design materials – be it physical objects, digital platforms or events - for the production of knowledge. To this end, it adopts a practice-based design research approach as a way to build theory and practice through models that guide what to research and how to do it (Koskinen et al. 2011). These models are conceptualised in the form of design research programs, which guide inquiry and inspire design interventions (Koskinen et al. 2011). The research program formulated in this thesis investigates ways in which interaction design can contribute to the formation of publics.

This research program has changed over time through iterative processes of articulating, representing and reconfiguring. In this way, formulating the program became intertwined with realizing it through experiments and formulating the results through reflection (Löwgren et al. 2013). In other words, designing became a continuous dialog between the design program and experiments constructing, influencing and challenging each other (Binder and Redström 2006). In this work, this dialog has been the result of a collaborative effort among different members of the interAction lab, with different backgrounds such as design and STS, which has influenced the way the program has been formulated.

However, investigating the ways in which interaction design can support the formation of publics is a broad research program which needed to be scaled down to make it approachable. This thesis adopts the concept of framings as a way to deal with complexity of research programs by shaping the scope of the program (Wakkary 2005). The framing discussed in this work is spazioD, which investigates ways in which interaction design can support the formation of publics within the scope of dyslexia in Trentino. Similar to programs, the framing became formulated, and reformulated, over time by reflecting on the result of experiments.

In practice-based design research, experiments are forms of engagements with the materials of design. This thesis shapes these engagements in the form of design interventions (Koskinen et al. 2011). The reason for this is an epistemological one: referring to experiments resembles user studies performed in controlled environments traditionally carried out in HCI. Considering the context in which this work has been done, referring to these engagements as design interventions might prevent confusing them with experiments that follow a systematic approach to design.

Design interventions in spazioD have been instantiated in three forms: physical artefacts, digital artefacts and events. These three forms compose a holistic method for interaction design interventions to support the formation of publics. These forms have been constructed not only through collective efforts in spazioD but also through other research framings, such as Smart Campus which will be described later in this chapter.

In this work, reflecting on the design interventions has not only helped us construct knowledge for influencing the design process but also for producing “takeaways”. As discussed by Löwgren et al. (2013), takeaways are insights and outcomes that travel outside

concrete projects to contribute to collaborative efforts, such as research publications. In this work, takeaways have taken the form of journals and conferences papers, which can contribute to the collaborative effort of academic knowledge production (De Angeli et al. 2014; Teli et al. 2015; Menéndez-Blanco and De Angeli 2016; Menendez-Blanco, Bjorn, et al. 2017; Menendez-Blanco, De Angeli, et al. 2017). Furthermore, this work proposes “programs for action” as a complementary kind of takeaways. Programs for action are inspirational and easily personalised material that can guide people who want to act on an issue and therefore they might be especially relevant for research programs engaging with the formation of publics.

In summary, the research program formulated in this work is influenced by the increasing corpus of literature in domains such as interaction design, participatory design and co-design investigating ways in which design can support the formation of publics (e.g. Björgvinsson et al. 2010; Binder et al. 2011; Seravalli 2013; DiSalvo et al. 2014; Le Dantec 2016) and also by STS concepts. Methodologically, the program adopts a practice-based research approached influenced by quantitative and qualitative methods in HCI and analytical methods in the social sciences.

### **3.2.3. Influence from the Social Sciences**

The issue addressed in this thesis relates to the social construct of dyslexia in Trentino. This can be considered a kind of social problem, similar to issues prevalently investigated in the Social Sciences. Indeed, as design research is increasingly dealing with social problems, it also needs to engage with forms of social science research (Tonkinwise 2017). However, these forms of social research need to be able to explore social problems in a way that allows designers to engage in creative actions. This entails adopting methods which engage with messy situations and thereby

moving away from objective and understanding-focus approaches which are part of social science research (Tonkinwise 2017)

Indeed, part of the research in the Social Sciences also provides a critical view on methods of inquiry which attempt to describe complex and messy realities by depicting them as clear and definite. In the book *After Method: Mess in Social Science research*, John Law (2004) criticized these methods because they tend to assume that there is an external reality that is independent and unique and, therefore, can be described. Instead, he argued that methods of inquiry do not discover or describe isolated realities but they participate to the production of multiple overlapping and interfering realities by enacting them (Law 2004).

This approach have been included in this thesis by adopting the concepts of matters of fact, as conditions that are considered to be unique and stable; and matters of concern, as complex social phenomena that are rooted in historical and political conditions (Latour 2004b; Latour 2008). In these terms, designing can be seen as an activity that allows articulating matters of concern. The importance of enabling and sustaining these processes of articulation is because they help maintaining on-going discussions about relevant issues within society (Latour 2004b). Matters of concern are relevant in this thesis because they acknowledge the importance of keeping a dialog with the Social Sciences and help locate this work within an existing corpus of research which explores how design can articulate matters of concern (DiSalvo 2009; Björgvinsson et al. 2010; DiSalvo et al. 2014; Teli et al. 2015).

#### **3.2.4. Program framing: spazioD**

The activities presented in this thesis have been carried out within Città Educante (2014 - 2017), which can be translated as “learning

city” in English. Città Educante is a research program aimed at investigating the role of the city as a place for inclusive and reflective education. This program has been funded by the Italian Ministry of Education, University and Research to investigate the role of the city as a collective learning place. The program was defined among fifteen national partners that include two large companies, two universities and two research institutes along with small and medium enterprises (SMEs). Each SME provides services and products in different areas of ICT, from social media analysis to cloud computing and wireless technology. The program aims at *“radically rethinking learning environments through the application of the most advanced digital technologies.”*<sup>2</sup>

The program covers and combines three main thematic areas: education, society and technology. The overarching outcome for the educational theme is to create innovative approaches that help people be more active, welcoming and reflective through the development of knowledge, strategies and technological applications. The overarching outcome for the societal theme is to facilitate the emergence of forums in the local territory where citizens and institutions—such as schools and companies—can interact. Finally, the overarching outcome for the technological theme is the advancement of digital technologies through the development of new platforms, services and applications grounded in research on cloud computing, collaborative sourcing, social networks, automatic text analysis, big data analysis and natural interfaces.

The overarching outcome of Città Educante becomes particularly relevant considering the evolution of HCI research. In concrete, the focus on educational applications for active and welcoming citizens illustrates ICT’s growing interest in engaging with societal issues through innovation, while the focus on enabling forums among citizens and institutions highlights the increasing attention

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<sup>2</sup> <http://www.cittaeducante.it>

towards engaging people into research projects. Indeed, in Europe the attention towards public engagement is also echoed by funding schemes, which increasingly acknowledge the importance of involving large and diverse range of actors in research and innovation <sup>3</sup>. However, the presumption that enabling these processes involves the advancement of particular digital technologies highlights the prevalence of technology-centric approaches. Thereby highlighting how difficult it might be to move away from existing approaches where more advanced digital technologies might be the solution for more pressing problems.

Città Educante allowed each partner to instantiate the program building on their skills and interests. The instance of the interAction Lab was spazioD, which was proposed as a project aiming to enable forms of inclusion in the Italian education system, with a special focus on dyslexia. In terms of our research program, spazioD was the framing that allowed reducing the complexity of the program by investigating ways in which interaction design can support the formation of publics within the scope of dyslexia in Trentino.

Our engagement with the project was not only based on a research interest but also on our personal stance to put our skills at use in projects that are meaningful to society. Although to different extents, everyone in the lab gathered around spazioD, as it also happened with other projects. In this way, spazioD built on the personal relationships and good atmosphere that we enjoyed in the group and at the same time it helped reinforce them.

Many of the activities within spazioD were co-organized with the ODF Lab, a research group at the Department of Cognitive Sciences from our same university that provided a scientific perspective on cognitive and psychological aspects of dyslexia. The

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<sup>3</sup> <http://ec.europa.eu/research/swafs/index.cfm?pg=policy&lib=engagement>

main activity of the ODF Lab is research and they also provide service to the community which takes many different forms. For example, they sometimes held informative presentations at schools, provide private services to diagnose dyslexia and offer support for dyslexic students at different levels, from primary school to university.

Early in the project, the interaction between the two groups paved the way for a joint project between two PhD researchers: Angela Pasqualotto from the ODF Lab, and Zeno Menestrina from the interAction lab (Menestrina 2017). The joint PhD project consisted of the development of an engaging and aesthetically pleasing video game for cognitive training and relied on the expertise of Angela, as a cognitive psychologist; Zeno, as a game researcher and designer, and Adriano Siesser, as a digital visual artist. The development of the video game entailed co-designed activities with middle school children and enabled the development of a design framework for games with a purpose, which constitutes Zeno's doctoral thesis (Menestrina 2017). Throughout the project, the relation with the ODF Lab moved from a shared research interest to a collaboration which largely relied on enjoying working together.

### **3.2.5. Personal motivation**

I became interested in processes of publics' formation led by the willingness to explore the role of interaction design in enabling bottom-up forms of participation. The trigger of my interest on this topic dates back to 2008, when I started a post-master on User System Interaction at the Technische University Eindhoven. This decision was grounded on the desire to complement my background in computer engineering with people and design. My work in that period was mainly focused on designing interactive systems building on user-centred design approaches (Caballero et al. 2010; Menendez-Blanco et al. 2011).

After graduation, I started working as a research fellow in Human Computer Interaction on projects using micro-crowdsourcing platforms (Ionescu et al. 2014; Larson et al. 2014; Radu et al. 2014). Collaborating with people with a background in Artificial Intelligence I found myself reflecting on the importance of different perspectives on the design of interactive systems. Also, working on these projects made me reflect on implications of digital labour. In particular, on the ethical considerations and the problematic aspects behind the ‘wisdom of the crowds’. This sparked dilemmas and discussions with colleagues and friends on the responsibility of researchers on larger social and political arrangements.

As a consequence of my increased interest on political implications of digital technologies, I pursued a PhD where I could further investigate issues of participation and technology. My initial research proposal for the qualifying exam, which was took place one year after starting the PhD, reflected this interest by providing an in-depth review of the literature related to interaction design and digital social innovation. This helped me explore differences between crowds and publics; and following this line of interest, I was introduced to concepts and methods in STS.

After the qualifying, I had shaped an initial research program but did not have a framing. Some people in the group were working on a project dealing with issues of participation and empowerment at the university campus. This sounded relevant for the research program, so I decided to join and thereby the Smart Campus project (2011-2014) became the first field I investigated (De Angeli et al. 2014; Teli et al. 2015). This project was funded by an innovation catalyst and it aimed to develop campus services with and for students. Smart Campus was especially interesting because it enabled the means for students to design and develop mobile applications for their own campus as part of internships. The

project tried to infrastructure the creation of a students' association that would allow these arrangements to live beyond the project. Unfortunately, Smart Campus finished in December 2014 and no students' association was created due to conflicting views between institutions which were irreconcilable. Retrospectively reflecting on Smart Campus, I realised the importance of exploring the articulation of different concerns and thought that this was something to keep in mind for future projects.

When Smart Campus finished, I explored several different possibilities which would allow me to explore the role of interaction design in the formation of publics. I call them self-initiated attempts of projects. To this end, I connected with people who were engaged into bottom-up initiatives on issues which were of my personal interest. I interviewed two people leading a popular and very active ethical purchasing group in Trentino; I met the leader of a project on wireless community networks in Italy and attended to a meeting of a group of people trying one in Madrid; interviewed and engaged into ethnographic activities with a grassroots group in Val Venosta (Italy), which had turned into a social movement to free their village, and valley, from chemical pesticides.

These initiatives were fascinating and people were always very welcoming. Some of them also proposed concrete ways in which my skills could contribute to the initiatives, such as developing a website and improving a database system. Even though I wanted to contribute to these projects, it was unclear to me how engaging into these activities could help me move forward in exploring the role of interaction design in the formation of publics.

As consequence, I started to get involved in projects in the interAction lab, such as spazioD and GARCIA. Both projects tackled topics of my interest. In concrete, spazioD – which was just starting- was being shaped as a project that aimed to enable

forms of inclusion in the Italian education system. On the other hand, GARCIA was an FP7 EU-funded project investigating how gender affects excellence and efficiency in research. Getting involved in these projects also meant having many opportunities for discussing and reflecting on the research program, which I found stimulating. Finally, I decided to concentrate my efforts on spazioD. This decision was not only influenced by my interest on the topic but also by the personal relation with the people working on the project.

Figure 3.2 depicts the timeline of my PhD, including Smart Campus, GARCIA and spazioD, as the main projects in which I have invested time. The lines before Smart Campus and GARCIA indicate that the projects were already on-going when I joined them and, in the case of GARCIA, it continued after I was no longer involved. In the case of spazioD, I was involved since the beginning. The timeline also includes the publications which build on Smart Campus and spazioD.

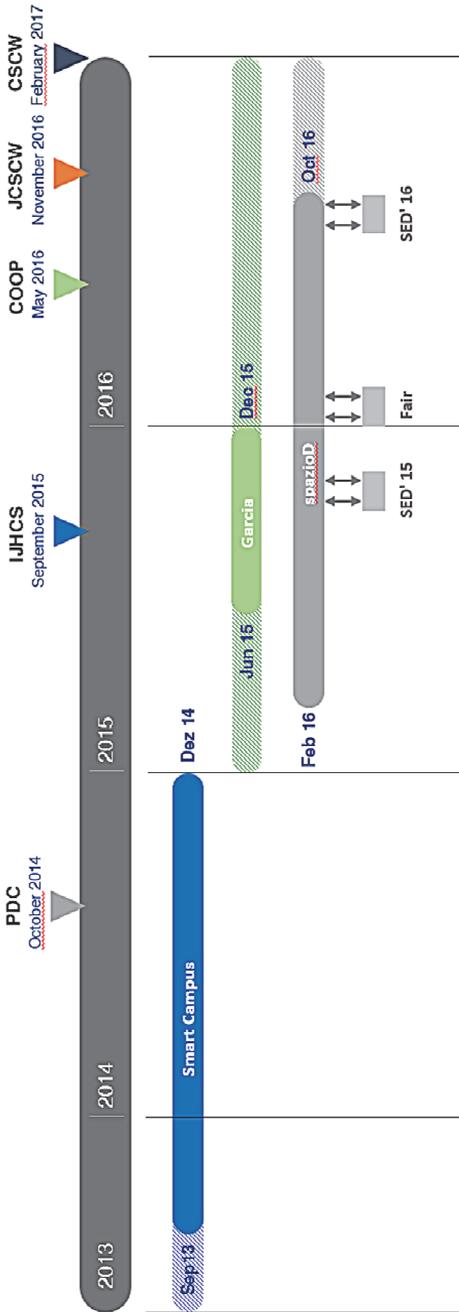


Figure 3.2 PhD Timeline.

PROVINCIA

RICERCA



TERZO

SETTORE  
(EDUCATORI)

BAMBINI

ASL  
CAPSS

GENITORI

INSEGNANTI

## 4. Articulating

Processes of public formation entail articulating different views on the issue at stake. To this end, processes of articulation aim at exploring different – and sometimes conflicting- concerns. This process also reveals different kinds of involvements among different actors. Revealing kinds of involvement is important in processes supporting publics' formation because it brings to the foreground actor's attachments in terms of dependencies and commitments (Marres 2007; C. A. Le Dantec and DiSalvo 2013; Le Dantec 2016). This chapter reports the results of an exploration of the issue of dyslexia in Trentino building on fieldwork data. The especial characteristics of the issue in Trentino are related to the recent attention towards dyslexia in Italy and a regional law on educational matters which has been denounced as disregarding dyslexic children. In order to know more about the peculiarities of this local context, three researchers – including myself- engaged in a series of fieldwork activities.

### 4.1. Fieldwork activities

Since March 2015, we have engaged in a series of ethnographically inspired activities around the issue of dyslexia. These activities aimed to explore the local context and existing opportunities for articulation in Trentino. To this end, we attended several public events organised at schools and private meetings organised by DSA Trentino. At the time of the fieldwork activities, DSA Trentino was a self-organised group of parents of children with dyslexia, which later became an association as it will be discussed in reconfiguring chapter.

In addition to attending to events and private meetings, we also researched the online presence of dyslexia at national and international level through social networks and websites of associations, as well as official documents provided on the local

government website. Furthermore, we paid particular attention to the narrative of dyslexia in the national and local communication media. By attending meetings and reading discussions on social networks we realised that dyslexia in Italy entailed a strong affective and emotional component, especially for children. For this reason, and based on ethical considerations, we decided not to involve children in the initial research activities.

As we were engaged in these activities, a colleague and myself performed eight semi-structured interviews with relevant actors in the local context: public officers, teachers, parents, and an educator. One of the public officers was responsible for the Inclusion and Equality Department of the local government; the other was responsible for the implementation of a new trilingual law, by which schools in Trentino needed to enable the conditions for teaching in English, Italian and German. Teachers were selected based on the recommendation of the two interviewed officers; parents and the educator were approached based on personal knowledge. The interview script was designed by building on the data collected through the analysis of the data collected in the public events, meetings, and online research and addressed potentially controversial topics such as the understanding of dyslexia and relations with other relevant actors.

As wrap-up of the interviews, participants were invited to describe to us the issue of dyslexia within the local context, emphasizing affected actors and their relationships to other actors and issues (Figure 4.1). To facilitate this activity, we provided them with ten post-its with the names of the relevant actors, and an empty piece of A3 cardboard. The list of actors was created using the actors who were mentioned during the seminars and meetings. This list included teachers, children, parents, associations, schools, local government, researchers, public health department, and private companies. In addition, participants were provided with a set of



Data source
Eight semi-structured interviews with related actors such as parents, teachers, government officials, and educators
Three local events around the topic of dyslexia organized by schools and by experts on dyslexia
Two monthly meetings organized by DSA Trentino
Two meetings with local government officials responsible for the DSA and “Trentino trilingual” law
National and international websites and social network groups organized around the topic of dyslexia
Four official documents on the “Trentino trilingual” law
Four public documents containing the minutes of meetings regarding the “Trentino trilingual” law

Table 4.1 Data sources

## 4.2. Exploring existing opportunities for articulation

This section explores existing opportunities for articulating concerns and forms of involvement in Trentino by building on the fieldwork data. Concretely, it elaborates on data that suggest the presence - or absence - of opportunities for articulation exemplified by initiatives or spaces that would facilitate discuss concerns, allow people know whether other people shared those concerns or make them aware of conflicting views. The results are discussed with respect to recurrent themes such as the narrative of dyslexia and precarious working conditions. For the sake of clarity, they are presented as individual themes, although they can only be understood from a holistic perspective.

### 4.2.1. Narrative of dyslexia

Parents, teachers and local officers claimed that the fact that dyslexic children experienced difficulties reading, writing or concentrating was often misunderstood. As a consequence, dyslexia was assumed to be a deficiency, a disability or a disease. Indeed, they reported having the feeling that those who were not professionally or personally involved with dyslexia often assumed

that it was a disability. They referred to the importance of uncovering problematic aspects in daily speech, such as when non-dyslexics children were referred to as “*normal*” children.

Paradoxically, the formal acronym DSA (Specific Learning Disorder, in English) was uncritically used to refer to both dyslexia and dyslexic children. The broadly spread use of the term during meetings, in social networks and in websites highlights the strength of the medical narrative, even among the people who found it problematic. During the meetings and the interviews, we listened similar concerns on the problematic aspects of the narrative of dyslexia both from teachers and parents. In spite of their shared concerns, teachers and parents often blamed each other for not knowing enough and having wrong assumptions regarding dyslexia.

According to some teachers, the lack of understanding of dyslexia became especially problematic when they spotted a child who might have difficulties reading or writing since their parents often became scared, or in denial:

*“I have children in the fourth class of the elementary school that do not have the diagnosis because of their parents... there is always a familiar context that it is not the same for all children and in which it is not possible to intervene. I think that parents try to do the best for their children, but many times they do not understand what is better” [Teacher]*

Examples in which teachers and parents were described as absolute actor – complaining parents, careless teachers - were very common in social media, interviews and meetings. As discussed in (Le Dantec 2016), the problem with actors being taken as absolutes is that they become rendered as a matter of fact (Latour 2004b; Latour 2008; Le Dantec 2016). A few times parents referred to concrete “good” teachers, and praised them for being an exception to the norm.

Assumptions regarding dyslexia seemed to also influence the relations between dyslexic children and their classmates. For example, it was reported that some parents did not want their children to work with dyslexic children because they thought that it might hinder learning. Indeed, parents and teachers mentioned that sometimes dyslexic children were mistreated by their schoolmates and, consequently, became isolated. As a result, feelings of frustration, anger, low self-esteem and sadness were often reported during the interviews, group meetings and particularly in social networks. Indeed, these feelings were usually more intense when children realised that they experienced more difficulties than their colleagues but did not have yet a dyslexia diagnosis:

*“They are sad children, sad because they feel misunderstood, at the margin of their social world and often isolated. They are children who usually remain aside.” [Teacher]*

Some teachers gathered children in events organised around the topic of dyslexia to minimise distress in dyslexic children. In concrete, they played movies related to dyslexia during lecture hours. In this way teachers became facilitators of these gatherings, which were facilitated by movies. Other teachers tried to minimise distress gathering children around activities where all children would feel included, without references to dyslexia. Concretely, they tried to privilege educational activities that minimised differences between dyslexic and non-dyslexic children such as learning-by-doing activities:

*“When we do natural sciences (...), we seed the vegetable garden, I make children dig and touch the ground (...). They live the discipline and not only study it. In this way, the problem of dyslexia, or any other kind of problem, becomes minimal.” [Teacher]*

Even though we did not talk with children, the data suggested that the extent to which they shared an understanding of each other’s

concerns was very limited. The data suggested that dyslexic children felt reluctant to disclose their characteristic to others. This moment seemed to have a particular relevance as there was a specific term - “*outing*” - to refer to the action of dyslexic children exposing their characteristic. Children’s emotional distress with respect to dyslexia might be influenced by the fact that in the school years considered in this thesis (age 5-16) being different seemed to be portrayed as a problem and seldom as a value.

Teachers and parents discussed the importance of daily teaching practices on dyslexic children’s well-being. Indeed, they elaborated on several specific practices that could stimulate negative feelings (e.g. highlighting errors with a red pen) or positive ones (e.g. making children participate in practical activities; highlighting strengths). This was especially present in social networks, where many posts contained pictures with examples of “good” and “bad” teaching practices. Looking through the lenses of attachments (Marres 2007), this can be seen as a situation in which involvement was mediated both by a concern with developing good didactic abilities and on supporting children’s well-being.

#### **4.2.2. Relevant knowledge**

Teachers and parents often claimed that their scope of action was limited by their knowledge of dyslexia and related educational, legal and technological aspects. Despite the fact that the local government published a set of operational indications for “specific learning disorders”, teachers claimed that it was difficult to find practical information about dyslexia. In particular, teachers and parents thought that finding information regarding legal aspects and practices that could support children at school and at home was a difficult task and sources were sometimes not consistent. To compensate for this situation, parents of children with dyslexia seemed to become avid information searchers on the Internet and supported each other by sharing the information. This was often the case in the monthly evening sessions organized by DSA

Trentino, a group of parents of children with dyslexia, and being held in the house of one of them. Even though these sessions were open and they might have been a good opportunity also for teachers, these sessions were mainly frequented by parents.

During these sessions, they organised activities that ranged from providing support—as when they invited adult dyslexics to describe their experience- to facilitating the services of experts—to sessions where educators who helped children with their homework were invited. In this way, DSA Trentino acted as mediator by identifying, contacting and engaging relevant actors by inviting them to the meetings. The public officers praised this kind of initiatives and encouraged the establishment of formal associations who would contribute to dealing with the issue of dyslexia, as they could collaborate with the local government and mediate between them and parents:

*“Associations should support parents and collaborate with the local government because the associations manage to gather parents’ voices, collect their opinions and synthesize them and, therefore, they should be the channel towards the local government. We usually experience a flow of communication between parents-government and parents- institution.... That it does not have much sense, it is not efficient and the system does not learn. And this is a problem.” [Officer]*

Furthermore, there were some professionals and companies in the territory, such as ODF Lab and Erickson, which got involved into offering public presentations. In these presentations, they provided information on policies (such as explaining the details of the diagnosis process), presented available resources (such as technological compensatory instruments), and offered their private services.

Furthermore, some schools had set up initiatives aimed at facilitating access to particular kinds of information. For example, one teacher (who was also responsible for special needs)

mentioned that her school had created a document that summarized the most important legal aspects related to dyslexia and how to interpret them in the school context. This document contained guidelines on the diagnosis process and a compilation of the benefits that dyslexic children can access by law. The digested information in the document was described as particularly valuable and therefore had been made available as a common resource to several secondary schools.

Indeed, this common document was an extraordinary resource since the data suggested that the opportunities to collect information on dyslexia were rare. Indeed, some teachers acknowledged not having resources that guided them on how to support dyslexic children, and those who did not have yet a diagnose but experienced difficulties reading or writing. Many claimed that this was due to a lack of support from the school. In these cases, the lack of institutional support was often compensated by proactively looking for professionals who could provide them guidance:

*“no one explains you anything... I know everything through word-of-mouth and experience... I have worked on my own experience because when I need something I become interested in it and I go to the one who knows about it, who at this moment are the special needs educational assistants, they know everything.” [Teacher]*

Interpreting legal and medical documents at school and at home seemed to be a major challenge but also an important step towards supporting dyslexic children. In this regard, DSA Trentino seemed to be the main actor organising practical activities to discuss legal and practical information. However, these activities had a relatively small reach, as their scope was usually limited to their network, which was mainly composed of parents.

The complexity of this kind of information together with the limited amount of opportunities that facilitated access to it might have influenced teacher's involvement to dyslexia. In concrete, commitments to the issue of dyslexia might have been influenced

by the need of an extra commitment to interpreting its legal and medical aspects. Here I refer to an extra commitment and not to a dependency because it was up to the teachers to get to know about dyslexia, as facilitating access to information about dyslexia and related procedures were not institutionalised. This required additional effort, combined with their precarious conditions – which will be discussed later in this chapter - might have jeopardized teachers' involvement with dyslexic children.

#### 4.2.3. Dyslexia diagnosis

After teachers identified a child's reading or writing difficulties, the law established that it was the parents' or tutor's responsibility to start the process that would lead to the diagnosis of dyslexia. Teachers claimed that dyslexic children were especially vulnerable before they obtained the diagnosis because the school was not allowed to apply dispensatory and compensatory provisions, such as additional time in written examinations:

*“Until the diagnosis does not arrive, in which it says that I am authorized to intervene in a certain way, and even if I have the intuition that the child needs it, until you do not have this damn piece of paper you cannot start doing anything.” [Teacher]*

In the familiar context, obtaining a diagnosis was also a defining moment. This was especially true in the cases in which parents did not understand why their children experienced so many difficulties at school and did not know how to help them, which made them feel powerless. In these cases, the diagnosis often came as a relief. Despite its relevance, diagnosis was seldom discussed among different actors.

The process of obtaining the diagnosis was a source of distress for children, parents and teachers. In particular, many teachers and parents complained that the process was too slow; giving rise to situations in which it was started at the beginning of school year

and still not completed by the end of it. Indeed, the issue of lengthy diagnosis processes had been contemplated at national level, which led to an agreement between the state and the region of Trentino-Alto Adige in 2012 <sup>4</sup>. This agreement required the process to be completed as a matter of urgency and, in any case, no later than the 31<sup>st</sup> of March of that year, in order for the school to have time to apply the dispensatory or compensatory provisions before the final examinations.

The agreement also indicated that if the public health department was not able to meet this requirement, the local government could independently decide to authorize private entities as long as they did not entail additional costs for the public system. This was the case in Trentino, even though the data suggest that this agreement did not contribute to generally decreasing the length of the diagnosis process but to a situation in which the public health department was described as a bottleneck while private entities were described as a faster way to diagnosis.

From a different perspective, some teachers argued that diagnoses of dyslexia, or other “*specific learning disorders*”, were becoming too common. Indeed, this view moves away from the medical perspective of dyslexia while placing the focus on the influence that teaching practices, institutional requirements or assumptions on standard learning processes might have on children’s learning. To support this claim some teachers argued that nowadays everyone who started the process “*comes back with something*” and that some children might only need some additional time:

*“From my point of view, it [dyslexia] is simply a lack of respect for the time that different children need. (...) If they would have done one year more at the kindergarten or one year more of elementary school, they would have probably straighten their path.” [Teacher]*

From the moment a child had a diagnosis of dyslexia, the family or tutor brought the diagnosis document to the school. Only then

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<sup>4</sup> <http://www.statoregioni.it/DettaglioDoc.asp?IDDoc=37451&IdProv=11032&tipodoc=2&CONF>

were the school and teachers entitled to act and apply the provisions envisioned by law such as the creation of the Personalised Educational Plan (PEP). In theory, the meeting to create the PEP should play a paramount role towards finding a compromise among different actors in terms of what should be done to ensure the children's well-being, how to implement it and who should do it. In practice, parents usually complained about the little proactivity of the school towards organising the meeting to discuss the PEP, which should also be renewed every year. Often parents of dyslexic children said that the school had never organised a PEP meeting to discuss their educative plan.

Teachers highlighted that the usefulness of this meeting often depended on the kind of professionals involved. In their opinion, professionals who belonged to the local public health department usually did not participate and their diagnosis document was too general, difficult to understand (it was usually described as "*too technical*") and lacked practical implications for the school. Generally, medical terminology was perceived as a hindrance in their interaction with the school and parents. In this situations, groups and associations were often described as mediators, as illustrated in the general description of one of the support groups for parents of children with dyslexia in Facebook which stated "*we will not provide medical strategies, we will not talk with technical terminologies; instead, we will use the simply language of our stories.*"

The number of opportunities for gathering around concerns regarding the diagnosis was very low. This is particularly significant considering the relevance of the diagnosis and the many different views that actors had on it. The meaningfulness of the diagnosis was challenged by teachers; while parents welcome it as a relief. The PEP meetings could be understood as opportunities

for discussing concerns regarding what to do after the diagnosis; however, the data suggested that they did not always take place.

#### **4.2.4. Encounters with digital technology**

Digital technology was described as important for mitigating reading and writing difficulties. Indeed, many parents and teachers metaphorically compared computers for dyslexics to glasses for the short-sighted. They supported this claim by arguing that children experienced fewer difficulties when they used assistive digital technologies and cognitive training software.

The importance of technology was also illustrated in the Law 170/2010, which stated that dyslexic children had the right to use supportive technology at school and at home. This is an extraordinary measure since children in Italian schools do not necessarily envision the use of computers in the classroom. Furthermore, the law provided that families could benefit from financial support to ensure their children's access to technology. However, most schools had little technological resources specifically designed for dyslexic students. In addition, parents complained that when computers were offered to dyslexic children at schools, they tended to be quite old. Many teachers denounced the scarce technological resources and highlighted that technology should not be limited to dyslexic children because it could assist all children. These teachers claimed that the relatively low availability of technological devices, such as computers and electronic whiteboards, was due to the school's limited financial resources.

On the other hand, officers argued that the technological instruments were available at schools but teachers did not use them. Some parents highlighted that teachers lacked the skills on how to use specific digital technologies and that the school did not envision specific support to help children to use the computer. Therefore, in most of the cases, the family, experts and

associations, both in the form of social cooperatives and grassroots groups, were the ones helping children use the computer and identifying available assistive software and cognitive training software. Unfortunately, this kind of knowledge did not reach either the school or the teachers:

*“When I look around I see parents which have informed themselves, who have children with difficulties and have got information, and they have these kind of [technological] support at home but at the school they are usually not used.” [Public officer]*

Furthermore, excelling in the use of computers seemed to have a positive effect on dyslexic children’s self-esteem and, according to teachers, many times they decided to pursue careers in technical topics such as computer science. Several teachers mentioned that once children learned how to use the computer, this became a strength since they were much more skilled with computers than other children:

*“Furthermore, they [dyslexic children] become kind of computer experts because they have this instrument only for them, so many times (...) they become our technicians.” [Teacher]*

However, to avoid feeling different from their classmates, dyslexic children often neglected to bring their computer to class, and the family sometimes influenced this decision:

*“Often they refuse to use these instruments in class because they are afraid of being judged as different, of being offended. (...) We need to make them [families] understand that using these instruments means providing a kind of fairness. Giving these children something that they are missing... the instrument that places them in the same condition as others. Because sometimes they say ‘but it’s better they don’t because maybe after they make fun of them’.” [Teacher]*

According to some teachers, not using compensatory instruments might start a vicious circle: without the computer, children might strive to catch up with the rest of the class and, therefore, increase their frustration and lower their self-esteem.

Most of the teachers reported using the Internet to look for didactic resources, such as media content to show to the students and examples of practical activities to be implemented in the classroom. Many of them identified specific websites or video channels to find material. These activities were usually performed alone and not shared with other teachers. However, an interesting case came out during one of the interviews in which one teacher described that at her school a group of teachers was trying to collaboratively create a digital platform for sharing relevant didactic content with all students. Some teachers thought that such a platform might be specifically useful for dyslexic children; for example, they could check their homework online and would not need to copy it from the whiteboard (a common problem among dyslexic children).

During the interviews, these teachers mentioned that the involvement of the school's IT services helped them in solving the technical issues. However, the platform was not yet available because adding content was too tiring and time-consuming. The fact that the involvement of the school IT services helped create this platform suggests that bringing people with different competences together can contribute to the emergence of initiatives that facilitate addressing the issue.

Some other teachers expressed scepticism or resistance towards digital technologies, arguing that they cannot supplement face-to-face and hands-on activities or that they did not have enough technological skills:

*"I have very basic knowledge, I am not a native user. I have been born in 1970 so I have started using the computer at the university (...). I have skills on how to use the [Office] package, and not even, I know a bit of Excel, Word and several browsers."* [Teacher]

Even though the lack of skills and time were main issues in relation to digital technologies, some teachers also expressed that the exposure that digital technologies and the Internet entails might

also be problematic. For example, one teacher expressed her concern about having English mistakes in a website linked to the school since that particular school was a reference point for the trilingual law.

#### **4.2.5. Precarious working conditions**

Most teachers were employed under precarious working conditions, which included not having a permanent position, being compelled to move among different schools and earning minimum wage. This often influenced their involvement in training activities regarding dyslexia. Teachers were usually overwhelmed by additional activities such as participating in pastoral activities, department board meetings and professional development activities. Per year, teachers were obliged to spend 40 hours in additional support activities and a minimum of 15 hours in professional development activities. An important issue among teachers was the uncertainty of which activities would be accepted as “additional support activities”. Also, they did not have a central system that registered or showed how many hours they had done and how many were missing. This uncertainty created a potentially problematic dynamic: teachers used to give preference to common support activities, which many other teachers had already done and therefore they knew would count, instead of engaging with different ones.

Most of the teachers described the professional development activities as an advantage. However, some of them complained about the way they are sometimes implemented. In most cases, complaints were related to the quality of the trainer and to the relevance of the proposed topics to their personal interests. In this respect, teachers wanted to be able to propose what to spend these hours on. During the interviews, a few teachers spontaneously proposed that spazioD could set up training activities on dyslexia

that would count as professional development activities. Concerns on precarious working conditions were only raised by teachers, in spite of the fact that they influenced educational aspects, and this was a reason of concern also for parents and public officers.

### **4.3. An overview of involvement**

Analysing the results of the actor mapping, we found that it was common that people described other people, groups of people and institutions' involvement and at the same time they provided their interpretations of how they should be involved, which were often conflicting. For example, most actors described dyslexia as an issue that is manifested at school or at home in the period in which children start reading. However, there were different perspectives on how affected actors, such as the school, teachers, and parents related to it. In general, most participants identified a single actor, or group of actors, who played a main role in the domain of dyslexia. In some cases, this main actor was the school as an institution. In this view, the school was responsible for enabling practices that would address issues within the domain of dyslexia such as the establishment of formal training on dyslexia for teachers and the development of a special educational plan for dyslexic children. In addition, the school was perceived as a central hub that should mediate among teachers and parents.

In many other cases the main actors were the children since they were the ones who were most affected and vulnerable. Very often children were placed into a cluster together with teachers and parents since they were perceived as the ones who committed the most. Looking through the lenses of attachments can help in elaborating actors' involvement to the issue: on the one hand, the involvement of the school was described as based on a dependency because of its accountability to provide a suitable learning environment for children. On the other hand, teachers and parents were described as becoming involved into dyslexia because of their

commitment towards children, who depended on the issue because of their vulnerability.

Even though teachers and parents were often described as part of the same cluster together with children, their relationship often seemed to be problematic. Teachers' lack of knowledge on inclusive educational practices and parents' attitude towards their dyslexic children and teachers were main sources of controversy. On the one hand, some parents felt that teachers did not understand the needs of their children and even wondered whether they were qualified to do so. This conflict was highlighted during the meetings with DSA Trentino and at the schools, where it was very common to listen to personal stories of parents complaining about a specific teacher.

On the other hand, some teachers felt overwhelmed by the interaction with parents. They complained that some of them did not understand the issue, or overlooked it, whereas some others showed an excessive preoccupation accompanied by a little willingness to collaborate. Indeed, teachers thought that they should not be made accountable for the interaction with parents. Instead, some of them proposed that the school should designate a mediator who would take that role. They suggested that this role could be held by the special needs representatives since they were already present in most schools and were knowledgeable on practices and legal issues related to dyslexia.

Furthermore, the involvement of associations in the issue of dyslexia was generally described as very important. In particular, teachers, parents and public officers envisioned that associations could help in many different ways, such as mediating among different actors (e.g. government-parents and school-parents), providing information on procedures and available materials (e.g. certification process, legal issues) and structuring the offer of

supporting services (e.g. provide educators, organize home-work groups after school).

They often distinguished among different types of associations based on the different kinds of activities they could undertake. For example, some people referred to social cooperatives, as established associations within the territory where educators offered support services during and after school hours; others referred to associations of parents, which were usually described as grassroots communities that were born out of the need to improve the communication among parents, schools and the local government. However, officers and teachers thought that some associations were very contentious, meaning that they brought too many complaints and too little proposals.

Associations were sometimes described as connected to the local government, public health department, and researchers. However, these connections had different connotations from the ones described among teachers, parents and children. More specifically, in this case they did not seem to be meant to describe close relations; instead, they suggested potential relations that could facilitate addressing different aspects of the issue of dyslexia, even though their current involvement to the issue, and to other affected actors, was described as very limited.

Zooming into the aspects that could help addressing the issue of dyslexia, some teachers expressed their interest in attending training activities organized by the public health department and research groups. They explained that this could help teachers and special need representatives have high quality training based on scientific knowledge. Companies were usually left out of most narratives since they were described as playing a minimal role in the debate. In those few cases in which companies were mentioned, they were considered as possible future employers of dyslexic children and potential sponsors for activities.

Although their involvement was described as limited, the local government and Erickson collaborate through the GiADA project (cf. 3.1.2). Public officers often described this project as a success but teachers did not think the same. Indeed, the project was often source of teachers' complaints because it required them gathering data and distributing questionnaires to parents, which increased their workload without providing any immediate benefit to their teaching practices. In general, teachers were critical about their relationship with the local government. They highlighted that public officers only contacted them to request data, but hardly ever to reply to their comments, provide information or acknowledge their work. On the other hand, public officers did not highlight any specific communication issue with teachers.

This mismatch might be related to the fact that public officers hardly ever described any interaction with teachers. Instead, their relation seemed to be mediated by the school principals, who were described as generally responsive. Nevertheless, public officers were usually quite critical on teachers and argued that they were resistant to change, particularly with respect to the trilingual law. Furthermore, in their opinion, teachers were manipulating parents of dyslexic children and deliberately damaging the act in their own interest. To support their position, they argued that the learning methodology embedded into the act included learning-by-doing methods that should not pose additional efforts to children with dyslexia and might even facilitate their learning.

Examples in which teachers and parents were described as absolute actor – complaining parents, careless teachers - were very common in social media, interviews and meetings. As discussed in (Le Dantec 2016), the problem with actors being taken as absolutes is that they become rendered as a matter of fact (Latour 2004b; Latour 2008; Le Dantec 2016). A few times parents

referred to concrete “good” teachers, and praised them for being an exception to the norm.

The mapping activity invited people to reflect in terms of absolute actors (Le Dantec 2016), and this is a limitation of this activity. In spite of it, it helped exploring the existing opportunities for articulation and revealing the role that involvement and assumptions on involvement had on the emergence of these opportunities. In concrete, it suggested that conflicting relations were often grounded on mismatches between assumptions and individual descriptions of forms of involvement among relevant actors. This can be illustrated by parents’ assumptions regarding teachers’ little involvement with dyslexia and dyslexic children, and teachers’ descriptions suggesting commitment in spite of their precarious working conditions. We refer to these relations as loosely coupled, meaning that they relate groups of people who are mutually dependent on an issue but which cooperation is limited or problematic.

#### **4.4. Considerations on articulating**

Through several fieldwork activities we explored the opportunities that actors had for articulating their concerns. We found that these opportunities were often hindered by actors’ assumptions regarding other actors’ attachments. For example, parents and teachers did not get together to talk about their concerns because there had assumptions regarding each other.

In these cases, the role of mediators seemed paramount as they were able to bridge discussions among conflictual actors allowing them to articulate their interests. With respect to the issue of dyslexia in Trentino, associations emerged as possible mediators; as exemplified by the many times that they were described as the ones who could mediate among the views of parents and public officers. Teachers could also be seen as playing the role of mediators among dyslexic and non-dyslexic children, to gather

them in events to discuss the issue of dyslexia, such as displaying movies. Although the data did not show whether these initiatives were successful at enabling understanding of different views, they serve as inspirational material for design interventions.

The project started by exploring existing discursive spaces, and the extent to which they supported different views coming together. In other words, we explored which opportunities people had for understanding shared and conflicting concerns (Latour 2004a; Le Dantec 2016). These explorative activities were mainly based on our individual efforts and did not entail the organization of interventions to create discursive spaces in which multiple views could come together, as in related research exploring the articulation of concerns as a form of democratic participation (e.g. DiSalvo 2009; Björgvinsson et al. 2010; DiSalvo et al. 2014). The reason for such an approach was grounded on characteristics of the context: the existence of a controversy, the emotionally charged atmosphere and our unfamiliarity with it.

More concretely, we assumed that, when dealing with controversial issues such as dyslexia, discursive spaces might already exist and knowing more about the existing staging of the affair and their multiple articulations (Gomart and Hajer 2003) would contribute to enabling future public involvement to the issue. In addition, since the very early stages of the project it was clear that this was an emotionally charged atmosphere with a pre-existing history, which made us concerned about our responsibilities on getting to know the context before organising an intervention. These concerns were related to the fact that we were unfamiliar faces in a context where actors seemed to know each other well. Indeed, articulating was as much about revealing concerns and involvements as about interacting with teachers, public officers, schools and parents to get to know each other.

Even though existing research on articulating issues highlights the importance of enabling deliberative activities among heterogeneous actors, as in hybrid forums (Callon 2009), our experience suggests that there might be emotional, or affective, aspects that might need to be taken in account before engaging into these activities. The fieldwork activities suggested that dyslexia is an issue particularly distressful for children and parents; and this needs to be taken in account when enabling discursive spaces with other –less emotionally affected - actors

This suggests that the extent to which initial activities in the articulation process are based on interventions needs to be considered with respect to the individual context. In addition, it suggests that the articulation processes might require designers to explore existing opportunities for articulation while reflecting on the concrete characteristics of the context and developing sensitivities towards it. As the design process unfolded and we got to know better the context and the people, spazioD increasingly engaged into design interventions to create opportunities for articulation processes, as it will be discussed in the following chapters.

In methodological terms, articulating is a process that engages in a dialog with the research program by opening up opportunities for design interventions. In turn, the program serves as a lens through which designers can look at these opportunities, thereby shaping these design interventions. Indeed, during the fieldwork many opportunities for design emerged. As when one of the teachers told us that they would like to have a digital repository to share relevant information but they had not gone very far because of lack of time; or when also a few teachers proposed that the project could organize training activities on dyslexia that would count as professional development activities. My supervisor and I had many discussions regarding how to proceed: should we discuss with the teachers the possibility of collaborating on the digital repository? Should we discuss with our colleagues from the ODF

Lab the possibility of co-organising a series of training activities on dyslexia for teachers?

These design opportunities were very attractive, because we felt empathic with the problems that many teachers revealed during the interviews and because we thought that they could use our skills as interaction designers in the development of such a system. However, we eventually decided not to move forward in this direction. The main reason was that these opportunities referred to issues which only related to a group among all actors involved in dyslexia. Instead, we wanted to engage into design interventions which focused on children's and their well-being. This was a difficult decision, especially because it also meant a higher degree of uncertainty: what is the object of design? what does it mean to design this kind of interventions? Which shape will they take? We had got some experience on designing events during the Smart Campus project, and thought that this might be a possibility. However, the uncertainty of what the shape of the design would be was definitely higher than the one we would have had to face working on the design of a digital repository.

What we see here is that the research program guided our design decisions towards those which, in our interpretation, allowed to investigate ways interaction design can support the formation of publics. Furthermore, articulating also served as inspiration for concrete design interventions within the research program. In concrete, the figures of speech such as analogies and metaphors which emerged during the fieldwork activities influenced the ways issues were represented, as it will be discussed in the following chapter.





UNIVERSITÀ DEL SALENTO  
SALERNO

# Settimana Europea della Dislessia

5 - 11 OTTOBRE 2015

**NELLE SCUOLE** | 5 - 9 ottobre

14.00 - 20.00

- 5 ottobre - Istituto Comprensivo Ravennate Sud
- 6 ottobre - Istituto Comprensivo Riva del Garda 2
- 7 ottobre - Istituto Comprensivo Cles
- 8 ottobre - Istituto Comprensivo Levico Terme
- 9 ottobre - Istituto Comprensivo Trento 8

14.00 - 18.00 - Laboratori con alunni e insegnanti

aperto a tutti

15.30 - 20.00 - Tecnologie e materiale informatico  
16.30 - 20.00 - sala a Ravennate, Cles e Levico Terme:  
esperti di DSA incontrano i genitori

**AL MUSE** | 10 - 11 ottobre

10.30 - 16.00

laboratori interattivi per

**CONOSCERE**

**GIOCARE**

**SUONARE**

interAction

COOP.IL



## 5. Representing

The fieldwork activities reported in the previous chapter suggested conflicting concerns and different views on the attachments of affected actors. These conflicting views were especially relevant because of their pervasiveness across multiple contexts and their negative influence on collaboration. Despite these conflicting views, the data suggested shared commitment towards dyslexic children and their wellbeing. In this regard, voices were raised against the narrative of dyslexia that portrayed it as a disorder, as it was detrimental for dyslexic children, while arguing in favour of a narrative of dyslexia as a characteristic. However, these voices often remained inaudible with respect to the prevailing medical narrative.

Moreover, and despite the fact that a few collaborative practices had emerged among schools, teachers, parents and associations, the collective capacity to act on issues was often limited by problematic relations among loosely coupled actors who, even though they were linked by the common issue of dyslexia, hardly ever interacted. Indeed, we—researchers and designers at the local public university with professional and personal attachments to the issue of dyslexia—were also entangled in this assemblage of loosely coupled actors.

From this standpoint, we engaged in a series of activities aimed at representing the issue of dyslexia and relevant actors. To pursue this objective, we relied on shared commitments towards children and their wellbeing. We engaged in the design of objects and interventions that tried to challenge the prevailing narrative of dyslexia as a disorder—which caused distress to dyslexic children—by proposing an alternative narrative of dyslexia as a characteristic while creating physical and digital spaces. In

concrete, we engaged with this undertaking based on events, artefacts and digital platforms.

## 5.1. Events

In March 2015, we engaged in the organization of a public event aimed at creating positive awareness about dyslexia. The organization of the event was initiated by the interAction lab, our research group, and the ODF Lab. For the organization of the public event we collaborated with many people and institutions including public officers, school principals, teachers, and the local museum. In addition, more than ten researchers became involved at different stages of the event.

### 5.1.1. Conceptual design and implementation

The decision of engaging into design interventions which focused on children' and their well-being was followed by several informal discussions on raising awareness as a way to address these issues. Antonella, who had been living several years in the United Kingdom, became inspired by “Dyslexia Awareness Week” and we quickly embrace the concept.

The “Dyslexia Awareness Week” is an initiative promoted by the British Dyslexia Association in the United Kingdom, which has been held on the first week of October since 2012. Although the main topic changes every year, in general this initiative aims at generating positive awareness about dyslexia by means of several activities such as exhibitions, performances and presentations <sup>5</sup>. These activities share a common format through which dyslexia is presented as a different way of processing information that entails weaknesses but also strengths. The kind of concrete activities have changed across the years. For example, the 2014 edition followed

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<sup>5</sup> <http://www.bdadyslexia.org.uk/fundraising/dyslexia-awareness-week>

the theme “*Dyslexia Matters...*” and focused on how dyslexia can be experienced in different contexts such as the school and the workplace. The activities included mentoring sessions for dyslexics, presentations and openly available resources such as a posters and presentations (Figure 5.1).

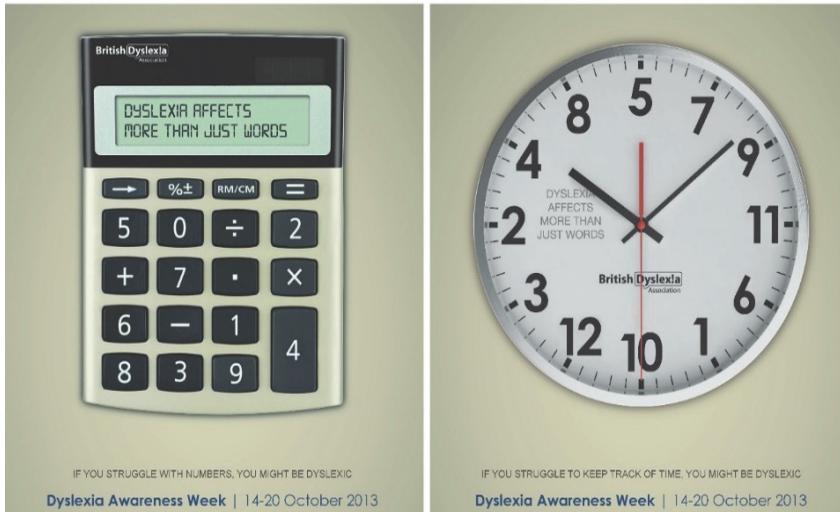


Figure 5.1 Dyslexia Awareness Week Posters in 2014.

On Building on this format, we envisioned the “Settimana Europea della Dislessia” (“European Dyslexia Awareness Week” in Italian) in Trentino. The concept was iteratively shaped in weekly meetings. The first meeting was held on the 19<sup>th</sup> of March and included Antonella, Maurizio, myself and those working on the design of the video-game for cognitive training. Organising a joint meeting allowed brainstorming on the event including different research interests on dyslexia within the interAction Lab: interests on dyslexia as an issue that can gather people together and interests on dyslexia as a characteristic which difficulties can be addressed with cognitive training. During the initial meetings, we worked on the conceptual design of the event and engaged into activities to be able to implement it. The conceptual design was an iterative and collaborative process and included the ideation of the

event and the visual identity. Figure x shows different prototypes for the visual identity of the event. The conceptual design of the event entailed reflecting on how to instantiate positive awareness in a way that it could gather actors with different views on dyslexia. In practice, it was carried out through brainstorming and sketching techniques.



Figure 5.2 Different prototypes of the visual identity of the event (credits to Adriano Siesser).

Activities regarding the implementation of the event included organizational, logistic and networking activities such as contacting and visiting different possible locations, documenting the spaces, and planning how to align the physical space and the conceptual design. Also, as the design of the event evolved, more interAction lab members were invited to the weekly meetings. At this stage, the conceptual design was quite stable, and most of the discussions revolved around implementation issues.

### 5.1.2. General description of the event

After several months of iteration, the event was held from the 5th to the 11th of October 2015 and challenged the prevailing narrative of dyslexia while outlining an alternative that described

dyslexia as a characteristic. To convey this alternative narrative, the event emphasised strengths often related to dyslexia such as creativity and good spatial skills. Building on the results of the fieldwork activities, and in alignment with the vision of the project by which this thesis was funded, the event also underlined the role technology can play in mitigating many of the difficulties that dyslexic people face and reinforcing their capabilities. Hoping to attract the attention of a younger audience, the emphasis was put on the ludic aspects of technology.

The week was divided into two parts. The first part took place at different schools and included activities such as workshops and presentations. The activities at schools were the result of a collective action among researchers, public officers and schools. This intervention was initiated by a proposal collaboratively drafted among researchers at the interAction Lab, ODF Lab and public officers. This proposal described the motivation for organising the event, a list with the proposed activities, their objectives, and their logistical requirements. The proposal was sent to five different “comprehensive schools”<sup>6</sup> in key areas of the region (Figure 5.3).

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<sup>6</sup> The term “comprehensive school” refers to a specific arrangement in the Italian scholastic system by which one school acts as a hub for nearby, usually smaller, schools.

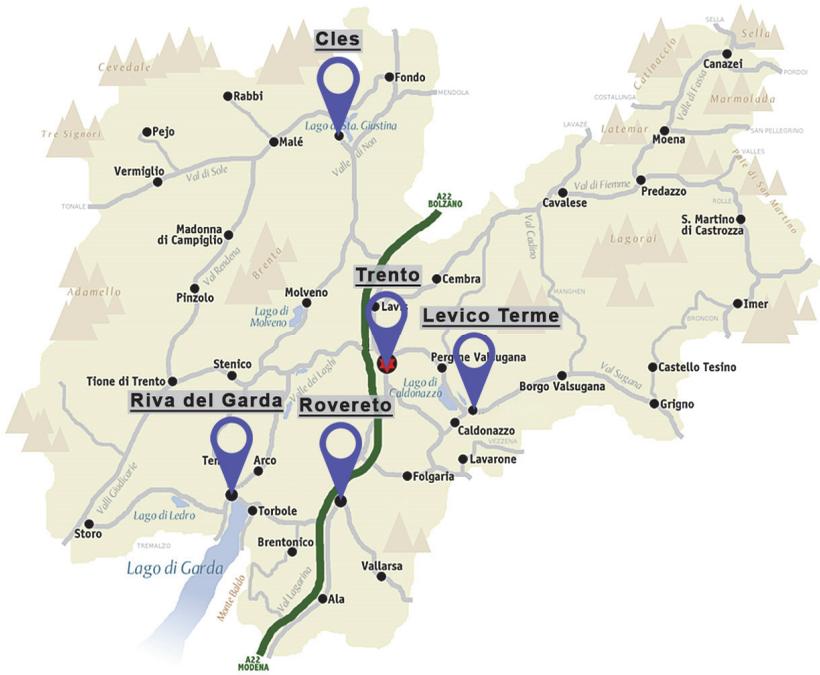


Figure 5.3 Five locations where the event at schools was held.

The initiative was largely welcomed. After that, school principals, teachers and our research group collaborated in the operational part of the organization of the event such as selecting the spaces in the school and scheduling the activities within the event.

The second part of the event took place on a weekend in the Museum of Science and Natural History in the regional capital. It consisted of an interactive exhibition and a workshop at the FabLab inside the museum. The exhibition and the workshop were the result of collaborative effort among researchers, employees and volunteers at the FabLab and the museum. The exhibition took place in a large room inside the museum, which was specifically chosen as it was in an area where admission was free of charge. The exhibition featured a journey connecting several artefacts

which emphasized creativity and technology as a compensatory instrument.

### 5.1.3. Activities at schools

The daily program included workshops with children and teachers, video game playing sessions, demo-sessions and plenary meetings. The workshops were conceived and conducted by ODF Lab researchers and took place during school hours. These activities involved separate groups of teachers (N=191) and children (N=321). The workshops with teachers included a presentation and a hands-on activity. This activity tried to put teachers into dyslexic children's shoes by asking them to create a concept map—a tool to represent and organise knowledge commonly taught and used in schools—of a highly complex text which at times was also confusing. A certificate of attendance was provided so teachers could prove their participation at the workshop as a training activity.

The activities with children included a workshop and a video game playing session. The structure of the workshops was similar to the ones for teachers and were also conceived and conducted by researchers from the ODFLab; the content and hands-on activities were adapted for children. The children were given a piece of text taken from *The Little Prince* by Antoine de Saint-Exupéry with some letters changed with others. After they tried to engage in decoding the text, they were given a key and invited to follow it to decipher what was written in the text. They were invited to work in groups and given a fixed time for completing the activity. In addition, during the playing and demo sessions children could try the video game for cognitive training developed within the project. The difference between the playing and demo sessions was that the former were carried out during school hours with classes of students and had been planned in advanced together with teachers, while the latter were open sessions carried out after school hours.

They usually took place at the entrance area of the school and were open to anyone who wanted to try the video game.

Activity	Number	People involved
Workshops with children	17	321 children
Workshops with teachers	6	191 teachers
Video-game playing sessions	12	258 children
Plenary sessions with parents, teachers and local government	3	100 – 150
Demo sessions at schools	5	100 – 200
Two-day event at the science museum	1	Unknown <sup>7</sup>
Wearable Zoo workshop at the FabLab	1	30 children

Table 5.1 Activities at the schools and museum.

Finally, on Monday, Wednesday and Friday evening, plenary sessions were organised. They were open to anyone interested in the topic of dyslexia and featured talks by a cognitive psychologist, a representative of the local government, and a representative of the public health department, who was an expert on dyslexia diagnoses. Table 5.1 contains an overview of the activities and number of people involved. The following sections will focus on the workshops with teachers, plenary sessions and event at the museum as they are the most relevant in terms of articulation and representation processes.

#### 5.1.4. Workshops with teachers

During the workshops teachers showed great interest, took notes, raised questions and initiated discussions by enhancing the information presented on the slides with their practice based knowledge. For example, when the compensatory and dispensatory provisions allowed by law were presented, they clarified consequences of each of them. One teacher pointed out

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<sup>7</sup> Even though it was not possible to estimate the number of people who attended the event, the room was crowded throughout the two days – with a few lower and higher peaks.

that, in order to ease their children's struggles, many parents tended to push teachers and the school to apply the dispensatory measures, such as exempting children from written examinations or subjects, such as foreign languages. She expressed a concern about parents' eagerness to suppress children's distress. More specifically, she suggested that exempting children from subjects might help in the short term but it might be also it might be counterproductive in the long run since they will not receive a high-school degree but a certification and this would limit their access to university. This observation did not only suggest a teacher's concern towards supporting children's learning but also towards not limiting their future beyond school. In addition, in all workshops, teachers brought up issues related to the trilingual law, showing a concern as to whether dyslexia implied difficulties with learning foreign languages. This concern suggests that teachers' adherence to the law was mediated by the effect that it might have on children's learning. It contrasted with the public officer's descriptions of teachers' rejection of the law which, in their opinion, was influenced by their resistance to change and an unwillingness to learn a language.

The teacher's concerns for dyslexic children's future beyond the school and difficulties in learning languages becomes especially interesting in the light of parents' assumptions of teachers' general disinterest in their dyslexic children. However, because the workshop was only for teachers, this did not contribute to the articulation of concerns among other actors – such as parents and public officers. However, the fact that so many teachers voluntarily requested to join workshops can be seen as an articulation on the different views on teacher's interests. In addition, the interest during the workshops and the amount of questions suggests that the workshop created a safe space for teachers to engage with dyslexia; differently as what it happened during the plenary sessions, as I will discuss in the following paragraphs.

Different views on dyslexia were revealed during the workshops, such as when a few teachers suggested that learning in English can trigger dyslexia. This view contrasted with the ODF Lab researcher's, for whom dyslexia is a neurological condition and therefore not influenced by the educational system. Some teachers' view can be illustrated by the comment of one of them who, while looking at the differences of percentage of dyslexia diagnoses between the United Kingdom and Italy, asked whether, with the implementation of the trilingual law, they could "*risk*" achieving the same situation as in the UK. In response, the cognitive psychologist argued that it would not affect the number of dyslexics since it is a neurological condition by which information is processed in a different way. In addition, she argued that the fewer diagnoses in Italy might be due to the fact that Italian is a more transparent language than English - meaning that written and spoken Italian are closer than English - and that the attention to dyslexia in Italy is quite recent – suggesting that before this national attention there were more “undiagnosed” dyslexics.

Interpreting legal and medical documents at school and at home seemed to be a major challenge but also an important step towards supporting dyslexic children. In this regard, DSA Trentino seemed to be the main actor trying to organise practical activities to discuss concerns on relevant legal and practical information. The importance of this information and its technical complexity might have influenced actors' involvement. In particular, these conditions suggested that the commitment to the issue of dyslexia was often mediated by a commitment to interpreting its legal and medical aspects. However, the knowledge and effort required to interpret this information and the limited opportunities for engaging with others might have jeopardized the involvement of relevant actors.

The outcome of workshops with teachers can be discussed in terms of their role in facilitating involvement and articulating different views. With regards to involvement, the workshops tried to open up opportunities for teachers to obtain knowledge on legal and medical aspects. This relates to the data of the fieldwork activities, which suggested that accessing this kind of information required an extra commitment from teachers in a way that might have jeopardised their involvement with dyslexic children. The workshops tried to overcome the barrier of obtaining practical knowledge and, in this way, facilitate teacher's involvement with dyslexic children.

However, the extent to which different views were articulated was influenced by the format of the workshop: presentations and hands-on activities proposed by the researchers. This format can be seen as the way dyslexia was represented which, in this case, it contributed to a distribution of power between the ODF Lab researchers – the ones presenting - and teachers – the ones learning that narrowed down the extent to which different views were articulated, and thereby the extent to which they became Things (Binder et al. 2011). This points to the challenge of designing representations around topics in which professional knowledge on some aspects of the matter at stake – such as didactic methods - can support involvement but also influence power distribution.

### **5.1.5. Plenary sessions**

The attendance at the plenary sessions varied between around 25 to 75 people. These sessions were particularly interesting because they brought parents, teachers, public officers, researchers, and public health officers together in the same room for the first time in spazioD. In terms of the processes proposed in this thesis, this was the first time that spazioD opened up an opportunity for collectively articulating different concerns on dyslexia.

The three talks – by cognitive psychologists, public officers and public health officers- focused on very different aspects. The cognitive psychologists focused on explaining dyslexia based on its different manifestations and proposed ways to address them. They described dyslexia as a different way of processing information, with multifactorial origins and that can manifest in multiple ways, which may differ across dyslexics. To illustrate the consequences of processing information in different ways they elaborated on the “automatisation deficit”, which is a condition characteristic of dyslexics. They illustrated this condition with an example of driving a car: the first time we drive a car is often a tense and tiresome experience; however, as we automatise the required skills it becomes easier and we eventually do not think about it. The problem of an automatisation deficit is that no matter how many times you have driven a car, it might always be such a tense and tiresome experience as the first time. They explained that this is what many dyslexic children experience every time they read and, as a consequence of the required extra effort, dyslexic children often get tired as the day or the scholarly year proceeds. They highlighted that parents and teachers should be particularly aware of this and of the influence that it might have on children’s self-esteem.

What is interesting here is that the cognitive psychologist had the specific capability to represent a technical term such as automatisation deficit and its consequences referring to what, for many, was an everyday experience. Similar to the workshops with teachers, the talk tried to overcome the barrier of obtaining practical knowledge that might hinder involvement with dyslexia. The talk, represented dyslexia as a concern that predominantly entails dealing with its everyday manifestations at home and at the school.

In their talk, the public officers focused on the legal aspects of dyslexia and stressed the importance of an early diagnosis. In relation to this, they described their commitment towards ensuring an early diagnosis by describing the GiADA project (cf. 3.1.2). One of the outcomes of this project has been a set of guidelines so schools know how to proceed in cases of dyslexia. Throughout the presentation, they often emphasized that it was important to create networks among family, teachers and school principals. The talk represented dyslexia as a collective issue, which requires actors to work together towards a common goal, as in a form of collective action (Bennett and Segerberg 2012).

The public health officers focused on thoroughly describing the diagnosis process and specified that it usually lasted three months, which disagreed with the up to nine-month timeframe that teachers and parents described during the fieldwork. After the diagnosis, they highlighted that it was vital to request a “*cognitive profile*” from the doctor because “*it will tell you what to do at home*”. This was one of the documents which teachers and parents had referred to as technical during in the previous research activities (cf. 4.2.3). In this talk, dyslexia was represented as a temporal process and addressing it mainly required being able to identify who were the relevant actors, and the information that needed to be passed from one to other.

At the end of the talks, everyone was welcome to ask questions or comment on the presentations. The great majority of questions and comments were made by parents. Some of them were concrete questions requiring clarification on practical aspects, such as the diagnosis process. Some others described their – usually unpleasant – experiences with teachers who, according to them, did not understand dyslexia. In these cases, dyslexia was represented as a struggle largely influenced by the inefficiency of the public health system and the lack of knowledge of teachers. Even though in all plenary meetings there was a small group of teachers – we could recognise most of them because they had

attended also the workshops - they usually sat together and they did not ask any question or provided comments.

The plenary sessions were envisioned as spaces where many discussions would unfold; however, the reality was different from our expectations. The plenary sessions were a mix of successes and failures. In concrete, the plenary succeeded at opening up opportunities for revealing different views on dyslexia among relevant actors. This was exemplified by the different representations of dyslexia in the talks and questions. This was an extraordinary opportunity, especially considering that actors hardly ever gathered together, as revealed in the fieldwork activities. Indeed, to the best of our understanding, this was the first public event on dyslexia to be held at schools in Trentino where parents, teachers, public officers, and researchers came together. Therefore, this suggests that these sessions helped relevant actors become aware of each other and of their involvement with dyslexia, which can be the ground that open ups discussions in future opportunities.

Indeed, one of these future opportunities happened just after one of the plenaries. The school principal of one of the schools organised drinks and snacks after the plenary session, where people mingled together. Even though we cannot know till which extent these informal gatherings enabled the articulation of concerns, I think that their importance should not be underestimated. In my own experience, it was through informal conversations with parents, teachers, public officers that I got to know more about their involvement, and I also had the opportunity to tell them more about our project and the other events in which we were involved, such as the event at the museum. Indeed, during one of these conversations I got to know a mother who was trying to set up an association of parents of children with

dyslexia in one of the valleys in Trentino. She came to two of the events at schools, and also to the one at the museum, where I introduced her to one of the parents of DSA Trentino, as their experiences might help each other.

Even though the plenaries opened up opportunities for exploring different views, their success in terms of articulating these views was limited. The plenary sessions revealed concerns, but they did not provide the means for understanding the different or conflicting views. What usually happened was that people presented their different views but hardly ever engaged into discussions on these views. Therefore, the extent to which these plenary sessions articulated different views in a way that people could deal with disputes – as part of Things - was rather limited. This does not mean that they there were lost opportunities; instead, it highlights the slowness and entanglements of designing Things.

Even though the plenary sessions explored new possibilities of political assemblies (Latour and Weibel 2005) - public plenary meetings at schools – the extent to which they supported creating these assemblies was limited. Reflecting on this situation helps elaborate on the role of design in supporting the formation of publics. In concrete, it highlights the importance of understanding representing and articulating not only as intertwined but also as complementary processes. This means that it is not enough to design interventions that represent an issue and expect that articulation will happen; instead, enabling ways for articulation to happen is also part of the design. Therefore, when designing Things, special attention needs to be put into foreseeing ways in which dialogs that allow dealing with disputes can be constructed. These ways can take many different shapes: from a mingling event after plenary sessions, to collecting and publicly sharing concerns and creating social media channels. The following chapters will further elaborate on ways which can help complementing articulation and representation processes.

### 5.1.6. Activities at the museum

Over ten different researchers were present in the museum room at all times, interacting with visitors and taking pictures and field notes. As people walked down the museum stairs, they would find a large window through which they could see the room where the activities were taking place. As people approached the entrance, there was a large cardboard box on a table, with a large panel posing the question: “*To me dyslexia is...*” There were colourful pieces of papers on the table where people could write a sentence that reflected their view on dyslexia and place them inside the box. As people approached the exit, there was another large cardboard box on a table along a large panel with the question: “*Now I think that dyslexia is...*” The same colourful pieces of papers were placed on this table, and people were also invited to write their answers and place them inside the box. Figure 5.4 shows both cardboard boxes.



Figure 5.4 Cardboard boxes at the entrance and exit.

When entering the exhibition space visitors would first encounter the “alternative lenses”, an artefact envisioned as a kind of ludic provocation. Next to it there was a large screen where a stop-motion video explained dyslexia using Lego bricks. The alternative lenses and the video became central to the process of representation and will be elaborated later in this chapter.

In the centre of the room, a large area was dedicated to play and games. In one part of this area a concert was staged where visitors could play cardboard music instruments (Tittarelli et al. 2014). It also included a game exploiting spatial thinking (Menestrina et al. 2014) and the video game for cognitive training developed by Zeno, Angela and Adriano.

At the other side of the room there was an area dedicated to methods and practices for dealing with dyslexia. In this area, there was a stand by Erikson, the company publishing books on dyslexia. There was also a prototype developed by the HCI group at the FBK that used eye-tracking technology and text-to-speech software for narrating text out loud by following a person’s gaze (Schiavo et al. 2015). Finally, there was a software application aimed at creating awareness on the importance of creating usable digital content by analysing the visual complexity of Internet sites (Miniukovich and De Angeli 2014; Miniukovich and De Angeli 2015). Figure 5.5 shows pictures of some of these interactive artefacts at event.

The general atmosphere of the event was very convivial. The room was quite busy throughout the two days, and some visitors—especially the youngest ones—stayed for a long time playing games and trying out the musical instruments. It was also quite common to see visitors and researchers discussing in groups. Among these visitors, we recognised some of the parents and public offers with whom we had interacted in the previous research activities. The following section describes in detail two of the artefacts that were present at the exhibition, which are especially relevant for this

thesis because they tried to destabilise some of the assumptions that regarded dyslexia as a disorder.



Figure 5.5 Event at museum.

## 5.2. Physical artefacts

As part our engagement into the design of objects that would challenge assumptions regarding dyslexia, two physical artefacts were conceptualised. The design of these artefacts was inspired by a critical design approach, meaning that they tried to prompt reflection on a specific issue through provocation (Dunne 2008). However, they had two main differences: they did not only try to prompt reflection on a prevailing narrative but they tried to challenge it by proposing an alternative; in addition, unlike most critical designs, they were not primarily built from a concern or curiosity of the designer (Pierce et al. 2015). Instead, the conceptual design was inspired by shared commitments and concerns revealed during the fieldwork activities. The figures of speech used by parents, teachers or public officers, such as metaphors and analogies, were especially useful for translating concerns into physical designs (cf. 4.2).

### 5.2.1. Alternative lenses

The fieldwork activities described in the previous chapter revealed a double-faced role of technology for dyslexic children. On the one hand, parents, researchers and teachers often described technology as an instrument that could help dyslexics. On the other hand, they also described situations which suggested that technology was stigmatising and mentioned that most dyslexic children refused to use the computer at school to hide their characteristic. This decision triggered a vicious circle: without the computer, children experienced difficulties in following the pace in the class and thereby they constantly needed to catch up with their classmates, increasing frustration and risking lowering their self-esteem.

During one of the discussions regarding the organization of the event at the museum, the idea of representing this situation through an artefact that triggered reflection on it came out. By engaging in a creative process of thinking through sketching

commonly adopted in interaction design (Buxton 2010), I became inspired by the metaphor revealed during the fieldwork: “*computers are for the dyslexic what glasses are for the short-sighted*”. Building on this metaphor, the “alternative lenses” were conceptualised. Figure 5.6 shows part of the sketching process by showing a storyboard illustrating a possible scenario of use for the alternative lenses.

In the following weeks, the idea was discussed with different members of the lab, who proposed different ways of implementing it. For example, one colleague proposed to create overlays of physical and digital images to enhance the playful experience. We spent several days investigating the technical feasibility and exploring possible options. Due to technical limitations – it was not possible to integrate the ad-hoc mobile app with a camera which allowed seeing through the mobile – the interaction with final artefact was slightly different and much simpler. While discussing the implementation, we did not only considered aspects that related to qualities of the alternative lenses as interactive devices (Will they provide audio or haptic feedback? Till which extent do they provide an engaging experience?) but also aspects related to their role in the process of representation (how well does the conceptual design represents the metaphor? What is the role of this device in the context of the event?). One concern was that the glasses could only be individually experienced and thereby might not trigger discussion. In an attempt to facilitate people to gather around them, we created two alternative glasses and decided to place them at the entrance to the room, where they would be presented as a playful provocation and set an informal mood for the event.

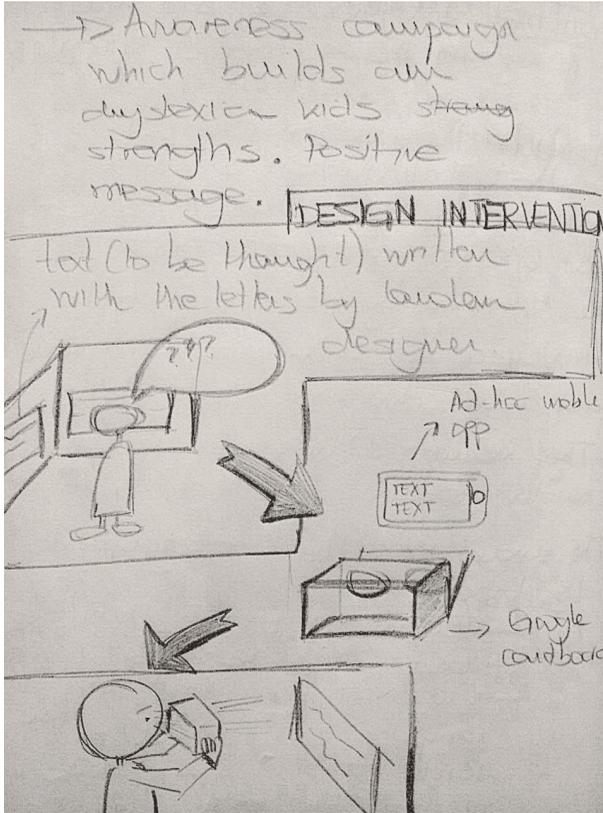


Figure 5.6 Initial storyboard illustrating the interaction with the alternative lenses.

The alternative lenses were ideated as a fun, interactive device that integrated playful aspects to make it more accessible to children. The lenses included two tangible objects: a pair of cardboard glasses and a poster. The cardboard glasses were a DIY virtual reality headset that allowed the exploration of a 3D landscape. The landscape was displayed as a photosphere image on the screen of a mobile phone placed inside the cardboard glasses (Figure 5.7). The poster displayed a sentence written in “Dyslexia”. This font aimed to incite aesthetic appreciation as well as allow people to experience the difficulties that dyslexics commonly face when reading. It had been designed by Dan Britton, a dyslexic British

designer whose work I discovered searching for “unreadable typefonts” on the Internet. Since the font was not publicly available, I wrote him asking whether it would be possible to include the typefont in the posters. He promptly replied and suggested to talk on Skype since he wanted to know more about the design intervention. He was pleased to know about the event at the museum, and we discussed a conceptually similar event in the United Kingdom in which he was collaborating at that moment. He was a freelance designer and the font was meant to be one of his products; however, he decided to make the type font freely available for the purposes of the event. This subtle act of kindness reveals the power of issues to connect people who did not have any other thing in common apart from the willingness to address the issue.

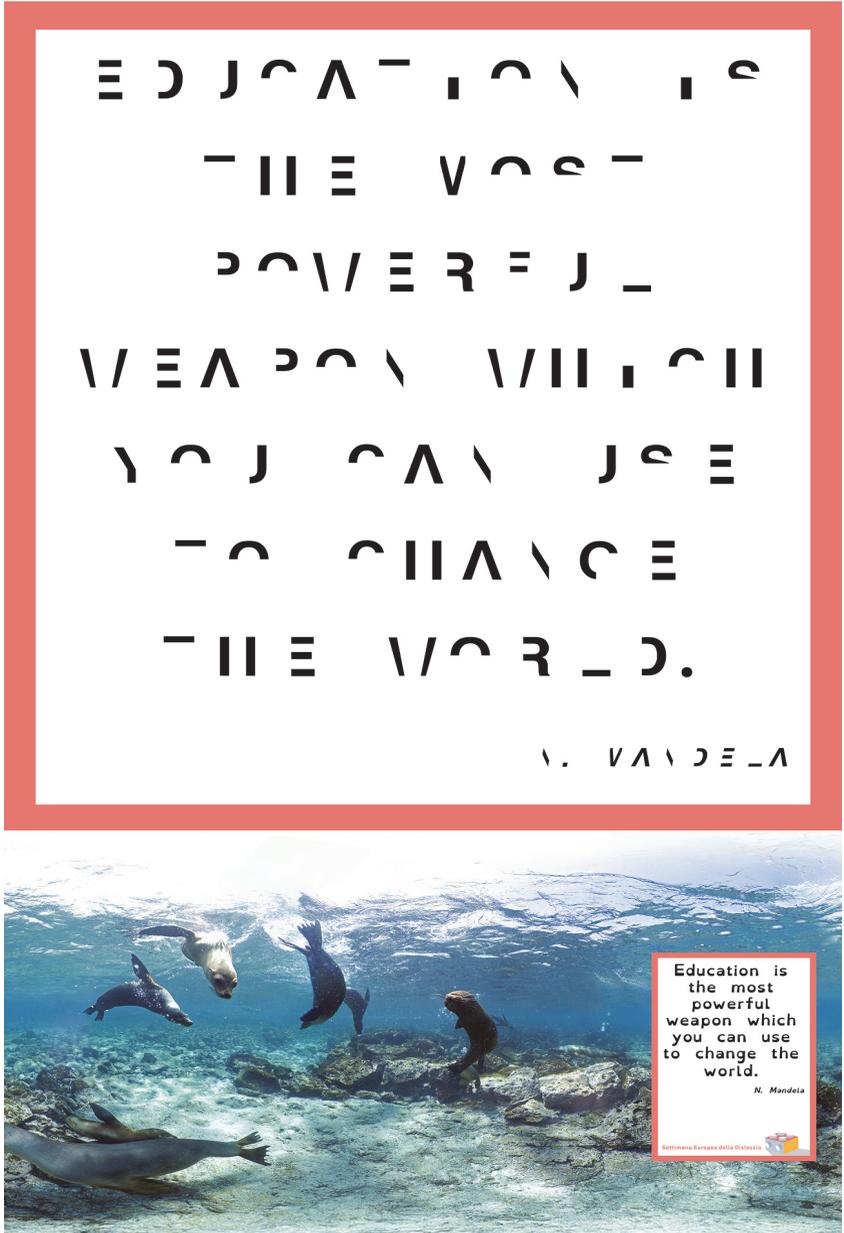


Figure 5.7 Example of poster (above) and photosphere (below) (translated from Italian).

The connection between the cardboard glasses and the poster was established by including an image of the poster within the photosphere. However, in this case, the poster contained a sentence written in “Open dyslexic”, an open source type font specifically designed to facilitate reading<sup>8</sup>. Wearers of the cardboard headset could experience different photospheres by tilting the cardboard glasses; tilting produced auditory feedback. An example, translated from Italian, is presented in Figure 5.7. This figure shows the physical poster, which contained the text “Education is the most powerful weapon which you can use to change the world’ N. Mandela” and its digital representation inside the photosphere image. Three posters were created with different quotes about learning from M. Montessori and N. Mandela. In addition, six photospheres were designed for two different sets of cardboard glasses.

### 5.2.2. Lego bricks

Different interpretations of “being different” emerged during the fieldwork. Some described it as a something neutral, some as a value and others as something negative. To challenge the view that being different is something negative, we created an artefact that consisted of two sets of Lego-Duplo bricks. The first set were the original bricks but painted in white. The second set consisted of 3-D printed bricks, which resembled the original, colourful ones but had a main difference: three faces of the parallelepiped (instead of only two, as in the original brick) could be connected to another brick (Figure 5.8 and Figure 5.12). This characteristic rendered these bricks unique since they allowed building more creative constructions when combined with the original pieces. The bricks were 3-D printed in collaboration with the local FabLab. The idea of using white/colourful pieces of bricks was inspired by one of the

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<sup>8</sup> <http://opendyslexic.org/>

slides of a presentation by Luz Rello, a post-doctoral fellow at Carnegie Mellon University who specializes in Human Computer Interaction and dyslexia (see Rello and Baeza-Yates 2013). This presentation was organized by a dyslexia association based in Madrid. In her slides, Rello depicted the data corresponding to dyslexic people as colourful while other data was shown in grey.

The bricks were used in the creation of a stop-motion video recording (Figure 5.8). A graphic and a visual designer and PhD fellow at the interAction lab conceived and recorded the video. His research investigates how interactive visualizations can contribute to raising awareness on issues of public interest. After ideating the video, members of the ODF Lab was invited to create script to ensure scientific rigor in the descriptions. Finally, since the aesthetic quality of the video was an important aspect, a professional actor was hired to narrate the voiceover<sup>9</sup>.

To confront the narrative of dyslexia as a disability, the video showed two pairs of hands playing with the bricks. The original Lego-Duplo bricks were painted in white to increase the contrast. The 3-D printed bricks were enacted to build words with spelling mistakes, while the voice clarified that dyslexia is not a disorder but a different way of processing information. In addition, the hands built different shapes using the white and coloured bricks, while the voiceover explained that people with dyslexia tended to be very creative, as they often needed to develop strategies to compensate for the challenges of reading and writing. Finally, the bricks were manipulated to depict the lower percentage of dyslexic students in Italy, as compared to other European countries.

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<sup>9</sup> <http://spaziod.org/sites/default/files/file/videos/SED.mp4>

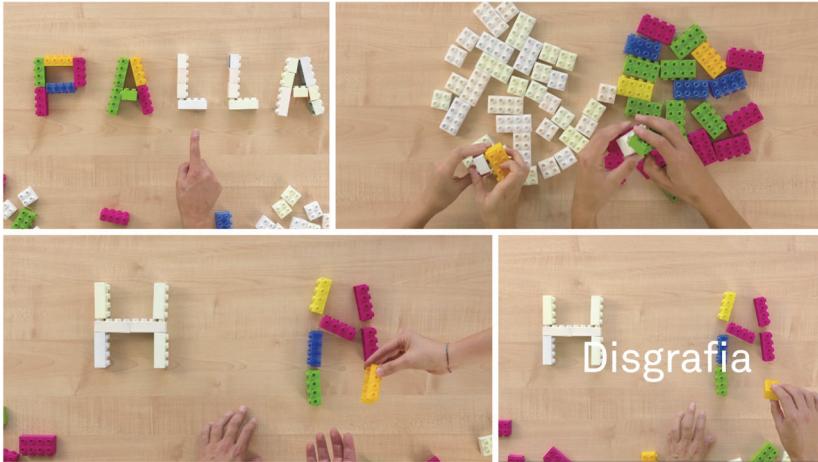


Figure 5.8 Screenshots of the video.

### 5.2.3. Enacting the physical artefacts at the museum

The “alternative lenses” welcomed visitors at the entrance of the exhibition as a playful provocation. They attracted both adults and children and supported interaction among them. The typical engagement transpired as follows: a child tries out the glasses, she would usually turn around and exclaim “how cool!” or “wow!” then, this behaviour would attract other people and many children would hand the glasses directly to other children inviting them to participate (Figure 5.9).

While the children were enjoying the glasses, many parents took the opportunity to talk with the researchers. These dialogues allowed the parents to relieve some of their tensions. Many parents highlighted that their children did not want to talk about dyslexia and that many of them experienced anxiety. This situation is exemplified by the case of one child, her older sister and mother entering the room. The child was being pulled into the room since, as her mother explained, “*she does not even want to listen to the*

*word dyslexia*". At first, the child was reluctant, but after seeing her sister playing with and enjoying the glasses, she gave them a try. After this, her enthusiasm was awakened and she decided to visit another part of the exhibition where she played a game, later returning to the glasses.

Some parents mentioned that teachers had spotted that their child might have reading or writing difficulties or that their children had been tested for dyslexia. Most of them seemed to be worried and often asked questions regarding the process of diagnosis. In these cases, it was crucial that cognitive psychologists were also involved in the event and could provide advice to parents. In this way, the "alternative lenses" created opportunities to connect different and diverse actors with a shared interest on dyslexia. Moreover, the "alternative lenses" also facilitated a connection with additional actors only peripherally involved in the dyslexia agenda; those who had little concerns on the issue of dyslexia. For example, the glasses became a talking point to discuss dyslexia with people who were unaware of the major concerns experienced by parents and children prior to the exhibition.

The enactment of the "alternative lenses" as a critical design artefact also confirmed a general confusion concerning dyslexia. For example, some parents asked whether the poster showed how their children saw written text. These situations were very delicate, since it was critically important to us that the message of the artefact was not misinterpreted. While the openness of the artefact was important to engage people, it was also important to ensure that it would not misrepresent aspects of dyslexia. On this perspective, interaction with visitors during the event was crucial. Many parents asked their children to read the physical and digital posters as a kind of a test, rather than focusing on the playful experience during the exhibition. This was not our goal, and thus while talking with children and parents we tried to reduce the evaluation component and instead focus on discussing about their views and experience of technology and dyslexia.



Figure 5.9 Cardboard glasses (Picture courtesy of Linda Tonolli).

Next to the posters was a picture of the type face designer with his name, a QR code to his website and a quote stating his motivation for creating the font: *“being a Dyslexic student I wanted to create a piece of artwork that would allow an understanding and a sense of empathy between non Dyslexics and Dyslexics”*. We presented him as an “outstanding British designer, who is himself dyslexic”. One couple, whose son is dyslexic, paid much attention to the font as a standalone piece of design. The mother introduced herself as the director of a school in the region, who had recently discovered that her youngest son was dyslexic. They became very interested in the poster and the font and took a picture of the QR code to contact the designer. They expressed an interest in creating similar posters to be placed at their local school. This observation suggests that the alternative agenda enacted by the artefact inspired related actors to extend its use in different settings and forms.

During the exhibition, it was common to see children around the room playing with the two sets of Lego bricks placed on the tables, building constructions which took advantage of the possibilities that the 3D printed bricks provided. Some of the bricks were on a table where the stop-motion video was played in a loop on a large screen. Headphones were provided to improve the experience. Many people stopped and watched the video and a few teachers asked us whether it was publicly available and expressed an interest to show it at their school. However, most people did not seem to wonder about the extra feature of the bricks or did not ask about it. Only when the special characteristic of the additional play face was brought to their attention did they realise it and found it meaningful. Interestingly, in a workshop organized in February 2016 with parents of children with dyslexia, one mother told a researcher that she had secretly taken one of these bricks during the event and used to carry it inside her bag. This subtle, and somewhat subversive, action highlights how meaningful the proposed alternative agenda embedded into the critical design artefact was for some of the affected actors.

#### **5.2.4. Alternative lenses at a FabLab workshop**

On Sunday afternoon, a “Wearable zoo” workshop was held at the FabLab. The workshop was ideated by the interAction Lab and collaboratively organised between with members of the FabLab. The initial concept to organise a tinkering workshop for children where they could customise and bring home the “alternative lenses”. The main motivation for organising this workshop was to involve both people concerned about dyslexia as well as those who were not concerned (Latour and Weibel 2005). To that end, we proposed the idea to the manager of the FabLab, who suggested to organise a meeting where the responsible for public engagement would be also invited. This meeting was held in May 2015 and participants included Maurizio, myself, the manager of the FabLab, and the responsible for public

engagement. The concept was welcomed but it was important to frame it in a way that would be relevant for the museum, which focuses on natural sciences. During the following months, the members of the FabLab and myself meet several times to find a format of the workshop that would be relevant for both parts. We considered tinkering the Google cardboards with recycled materials as a way to discuss issues on global warming, this was relevant for the museum but confusing in the context of spazioD. We also consider tinkering the cardboards with different laser cut materials, so children could get some experience laser cutting; however, this did not include a particularly relevant frame for the museum. Finally, one of the members of the FabLab proposed organising a “wearable zoo”. Concretely, relying on the rhetoric of being different as something positive, he imagined the cardboard glasses as animal masks (Figure 5.10). However, these were a particular kind of animals, which were composed of characteristics from three different animals (e.g. pig tail, deer horns and elephant trunk). In this way, the workshop was relevant for dyslexia, but also for a natural science museum; achieving this was only possible because of the meetings in which we discussed ways in which the workshop could be relevant for both parts. Indeed, the format of the workshop became a resource for further interventions<sup>10</sup>.

During the workshop, children could tinker with the “alternative lenses”, personalising them as animals. The activity was often mentioned when talking with people at the interactive exhibition and announced through the museum’s speakers only 15 minutes before it started and quickly became very popular. While people (mostly parents and children) waited in line to access the workshop, they stood next to the posters and a researcher explained the motivation behind the activity. Many people did not

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<sup>10</sup> <http://www.instructables.com/id/Wearable-ZOO-Masks-Tinkering-Workshop/>

know much about dyslexia or thought that it was a disease, confirming previous results. The critical design artefact helped by recalling situations at school. For example, a mother, talking to her daughter, explained her that [name of daughter's classmate] brought the computer to school because she was dyslexic and it helped her read.

One of the parents waiting for her child to attend the workshop was a teacher who agreed that it was important to create awareness about dyslexia. She claimed that she also tried to contribute to it at the school. For example, she mentioned that she had organized a projection of the movie “Like Stars on Earth”<sup>11</sup>. This movie came up quite often in discussions about ways to raise awareness of dyslexia, especially because during the conception of the event we had considered the option of organising a one-week film festival. For this purpose, we had created a list of films about dyslexia, which featured dyslexic actors and/or directors, or which celebrated diversity and learning. However, we did not think to include this movie because it is a drama film with a narrative based on the struggles and difficulties faced by a dyslexic child that, in our opinion, is far from a positive agenda such as the one our design interventions tried to bring forward. This suggests that, although the activity aimed to present an agenda on positive awareness of dyslexia, it also supported the emergence of different representations which might not have been aligned with the perspective of the event but which could contribute to facilitate involvement.

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<sup>11</sup> <http://www.imdb.com/title/tt0986264/>



Figure 5.10 Wearable Zoo at the FabLab (Pictures courtesy of Linda Tonolli).

Children had a lot of fun creating and tinkering with these animal forms, even though it was not clear whether any message derived from the proposed agenda passed to them. In general, it was not clear that the artefact challenged an existing narrative and proposed an alternative political agenda. For example, some people asked whether there exist glasses for helping dyslexic

people read. However, once the metaphor of “*computers are for the dyslexic what glasses are for the short-sighted*” was explained, many parents could easily relate to the challenges inherent to bringing computers into the classroom. Furthermore, they found that the metaphor reflected a message that should be passed on, as exemplified by the occasion on which a mother asked her daughter to pay attention when the researcher explained that if children thought that the computer helped them writing and reading, there was nothing awkward about bringing it to school.

### **5.2.5. Combining artefacts**

Some of the artefacts that were part of the event had not purposefully been designed for it. Instead, they had been constructed as part of different design research programs: from understanding the theoretical foundations for games for a purpose to understanding interaction design qualities that can support automatic computation of interface aesthetics.

In the case of artefacts which had not purposefully been designed for the event, the process of representation entailed designing an artefact that would represent them in terms of spazioD. This was done through an event brochure, which described the activities as part of the project (Figure 5.11). The brochure included an introductory description of dyslexia, where it was depicted as a condition that makes reading more difficult and usually entails dealing with issues at practical, social and psychological level. The intervention at the museum was presented as composed of three spaces for learning, playing games and playing music. The brochure also included a short description of the research groups. Acknowledgements included the director of the museum and the manager of the FabLab. The brochure was signed by two professors, one leading the interAction lab and the other the ODF Lab.

Designing this rather simple-looking brochure required a quite substantial amount of work. The text went through several iterations of revisions among different people at the interAction and ODF Lab. It was important that the text referred to the shared concerns, namely the problematic narrative of dyslexia and children's well-being. In addition, it was also important that it provided a comprehensive view of what people could expect at the event. Large of the discussion was about the logos and names which should be included in the brochure.

Indeed, this brochure is an interesting piece of design because it reveals the tensions we faced trying to organise an event where everyone could express their view on dyslexia and, at the same time, making the event actually happen. On the one hand, we wanted to support gatherings around the issue of dyslexia which revealed all different views; on the other hand, the feasibility of these interventions was influenced by practical, institutional and financial dependencies.

These tensions become visible in the brochure. For example, they are illustrated by the fact that we presented ourselves as institutional actors together with the province and signed the brochure with the names of the two professors. Even though this revealed an organizational structure behind the intervention, it also contributed to making the event happen. In concrete, participating as institutional actors made the event possible because in this way we had access to the museum and to funding from Città Educante. Another example of these tensions is the way in which different actors were represented in the brochure. In concrete, teachers, public officers and the group of parents were implicitly included in the acknowledgements as "several institutional actors and citizens". However, the local public health department was explicitly included by adding their logo. This

decision was mainly due to the fact that they financially supported the event by printing the dissemination material.

## Settimana Europea della Dislessia

UNIVERSITÀ DEGLI STUDI DI TRENTO

## Settimana Europea della Dislessia

**5 - 11 OTTOBRE 2015**

**informazioni e contatti**

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Evento organizzato da  
Università degli Studi di Trento  
Dipartimento di Ingegneria e Scienza dell'Informazione:  
interAction Lab,  
Dipartimento di Psicologia e Scienza Cognitive:  
Laboratorio di Osservazione Diagnostica Formazione

MUSE | 10 - 11 ottobre

10.30 - 16.00

Con il contributo di

In collaborazione con

Con il patrocinio dell'Azienda Provinciale per i Servizi Sanitari

**Riflessione sulla dislessia**

Vi proponiamo una riflessione per guardare il mondo con gli occhi curiosi di una persona dislessica. Dal 5 al 9 ottobre andiamo nelle scuole Trentine, il 10 e l'11 vi aspettiamo al MUSE e in seguito in uno spazio digitale in cui innestare un processo concreto e sostenibile di collaborazione che coinvolga cittadini e cittadini, insegnanti e studenti, istituzioni e volontariato.

La dislessia è una condizione neurobiologica che rende più complessa la lettura. Le statistiche italiane indicano un'incidenza di circa il 3% nella scuola primaria e secondaria; in altri stati europei si evidenziano percentuali superiori, fino al 10% nel Regno Unito. Le persone dislessiche sono intelligenti quanto le altre e si ritiene che molti personaggi famosi, fra cui Agatha Christie, Leonardo da Vinci, Albert Einstein e Pablo Picasso, fossero dislessici.

Indipendentemente dal loro talento personale, alunni/è sono svantaggiati in un sistema scolastico, come quello italiano, ancora fortemente basato sulla letto-scrittura. Le difficoltà pratiche, psicologiche e sociali sono molteplici e possono essere affrontate solo da un processo partecipato e consapevole in cui i diversi protagonisti contribuiscono con le proprie esperienze e conoscenze.

Il progetto nasce e prende forma dall'incontro fra due gruppi di ricerca dell'Università degli Studi di Trento: il laboratorio interAction (Dipartimento di Ingegneria e Scienza dell'Informazione) e il Laboratorio di Osservazione, Diagnostica e Formazione (Dipartimento di Psicologia e Scienze Cognitive). Abbiamo combinato le nostre competenze cliniche e di progettazione in un processo di innovazione sociale che ha coinvolto genitori, insegnanti e istituzioni, usando la tecnologia come materiale fluido per favorire riflessione e dibattito, affrontare le difficoltà legate alla dislessia e rafforzare le competenze di tutti.

**Programma**

Nelle scuole incontri e laboratori con alunni ed insegnanti per conoscere la dislessia e provare nuovi strumenti di supporto per gli apprendimenti.

(5 ottobre - I. C. Rovereto Sud; 6 ottobre - I. C. Riva del Garda; 7 ottobre - I. C. Cles; 8 ottobre - I. C. Leivo Terme; 9 ottobre - I. C. Trento 6)

A Rovereto, Cles e Leivo Terme si terranno degli incontri serali con i genitori e i professionisti che lavorano sul tema della dislessia.

Al MUSE la riflessione si articola metaforicamente e fisicamente su 3 piani dell'edificio. Le attività che proponiamo combinano dimostrazioni tecnologiche, attività laboratoriali e poster informativi.

**Spazio per Conoscere - piano terra**  
*Università di Trento, FBK, Erickson*

Il tema è affrontato in modo giocoso, ma scientificamente rigoroso, concentrandosi sui punti di forza delle persone dislessiche quali creatività, pensiero critico, abilità di costruzione e intelligenza emozionale. In questo spazio, potete confrontarvi con esperti, interagire con i risultati della ricerca informatica, provare alcuni strumenti compensativi disponibili sul mercato e proporre nuovi modi di azione collettiva.

**Spazio per Giocare - secondo piano**  
*interAction Lab, ODFLAB - Università di Trento*

Recenti ricerche neuropsicologiche hanno dimostrato l'efficacia di strumenti informatici per l'esercizio cognitivo in diversi ambiti di apprendimento, quali comprensione, calcolo, scrittura e lettura. Questi strumenti però spesso presentano il limite di essere noiosi. Per questo abbiamo creato insieme a 60 alunni e alunne (9-12 anni) *Skies of Monowork*, un video-gioco in cui gli esercizi sono integrati nella trama avvincente di un viaggio nella fantasia. Venite a provarlo e aiutatesi a migliorarlo.

**Spazio per Suonare - terzo piano**  
*Laboratorio di Robotica e Tecnologie dell'Apprendimento - Università di Siena*

In questo piccolo teatro potete provare SxS (Sound and Sensors), un sistema di strumenti musicali progettato per coloro che, pur non avendo conoscenze in campo musicale, abbiano voglia di approcciarsi alla musica in maniera fisica ed innovativa. Il sistema è stato sperimentato per il trattamento della dislessia, attraverso un'attività coinvolgente basata sulla musica rap.

**Il gruppo di lavoro dell'Università di Trento**

Questo progetto ha preso forma attraverso un processo di partecipazione che ha coinvolto un vasto numero di attori con competenze diverse, ma uniti dalla stessa visione. Il motore si è innestato grazie al talento, alla passione e alla tenacia di un gruppo di ricercatrici e ricercatori dell'Università di Trento, in parte supportati dal progetto "La Città Educante" (finanziato dal Ministero dell'Istruzione, dell'Università e della Ricerca, PON RSC, 2007-2013). È stato un piacere lavorare con loro: Adriano Sieser, Alkaios Minkoukous, Andrea Conci, Angiola Di Fiore, Angela Pasqualotto, Antonella Ammirati, Cristina Core, Gianluca Schiavo (FBK), Linda Tonolli, Maria Menendez Blanco, Matteo Moretti, Maurizio Tei, Veronica Tranquillini, Zeno Menestrina.

**Ringraziamenti**

Il lavoro è stato facilitato da vari attori istituzionali e cittadini. Ringraziamo innanzitutto l'Università di Trento per il supporto incondizionato, la Provincia Autonoma di Trento che ci ha aiutato a raggiungere le scuole del territorio e le scuole coinvolte per la disponibilità e l'entusiasmo.

Un ringraziamento particolare va a Michele Lanzinger per averci ospitato presso i suggestivi spazi del MUSE e a Sabina Barucci e tutto il FabLab, per aver messo a disposizione conoscenze e macchinari per costruire i venturi.

**Partecipare**

Questo lavoro collettivo ha permesso di gettare un seme che tutti insieme possiamo fare crescere. Vi aspettiamo numerosi nelle scuole, al MUSE e sul nostro sito (spazio.org) dove potrete contribuire con esperienze, conoscenze e idee.

Antonella De Angeli  
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Figure 5.11 Brochure (front-above; back-below) distributed before and during the event.

This way of organization resembled a hybrid form of “organizationally enabled connective action” (Bennett and Segerberg 2012), which means that conventional organizations operate in the background but step back from projecting strong agendas to enable engagement around personalized action frames. In our case, even though we tried to enable people to express their different views on dyslexia, the extent to which we managed to do so depended on institutional and financial aspects, such as financial support from public institutions and access to the museum. In addition, it was also influenced by our inexperience on how to allow people to personalise the propose narrative, without projecting a strong agenda. This hybrid forms of organization became especially relevant in the digital platforms, as it will be discussed later in this chapter.

### **5.3. Digital platforms**

A page titled *Settimana Europea della Dislessia* (Dyslexia Awareness Week in Italian) was created on Facebook the 17th of September 2015 as a tool that could help advertise the events and thereby attract people to participate. In Facebook’s terminology, we created a community page, which is different from a group because members’ posts appear on a dedicated part of the screen instead of in the central wall. The decision to creating a page instead of a group was grounded on a prior exploration of two main Italian Facebook groups on the topic of dyslexia.

These groups were filled with negative messages and contained very few proposals for action. In addition, they provided a homogeneous view on teachers, who were often assumed to be part of the problem. With the aim of creating an artefact that would support involvement based on shared commitments rather than on assumptions regarding other affected actors, we decided to create a page that represented an alternative view of dyslexia as

a characteristic. We expected that this page would act as an external force, a provocation, where people would discuss about dyslexia.

### **5.3.1. Facebook page**

A community “engagement” plan –using Facebook’s terms- was prepared and implemented by two PhD fellows targeting the local community who could physically participate in the event. Their research was not related to spazioD but they kindly contributed with their time to the project. This help was crucial since, at the moment the Facebook page was created, those directly involved in spazioD – including myself- were overwhelmed dealing with the practicalities of organizing the event. Indeed, making the event happen required many resources on very practical actions such as printing posters, renting a van, collecting materials for the workshop at the FabLab.

The engagement plan included the preparation of content to advertise the event and the identification of Facebook profiles related to relevant actors mainly within the Trentino region. A part of the content was retrieved from selected sources on the Internet, while other elements were created within the project. The content created within the project displayed a visual representation that embedded the proposed positive narrative, leveraging on Lego-Duplo bricks as proxies for childhood, assemblage and creativity. The profile image of the page contained an image of the bricks (Figure 5.12). In addition, the bricks were present in other pieces of content published on the page, such as a set of content pills and the stop-motion video.



Figure 5.12 The two sets of Lego bricks (left) and Facebook profile image (right).

The content pills were pleasing images combined with short sentences that provided a direct, positive message about dyslexia. An example is provided in Figure 5.13. These sentences were written by clinical psychologists with the aim of demystifying assumptions on dyslexia, prompting reflection on alternative narratives and on the representations of these assumptions in everyday language. The content pills were very popular, as illustrated by the high number of likes, comments and shares they received.

An especially popular pill contained the following text: *“Children with dyslexia are intelligent, the reading difficulties that characterise dyslexia are independent of their level of intelligence.”* This pill received 395 likes, was shared 3,433 times and received 11 comments. People who shared the pills sometimes added a message such as *“have you understood??!”*, *“spread the message... not everyone knows it... neither at the schools!!!”* or *“I think this should be explained better to teachers because they tend to isolate students with this difficulty instead of helping them”*. In this way,

the content pills served as easy-to-personalise action frames (Bennett and Segerberg 2012), which were used for the purpose of expressing opinions regarding teacher and school's knowledge on dyslexia.

The content pills also triggered messages expressing disagreement, as illustrated in the following comment: *“I don't really agree with the second part [of the sentence], reading difficulties are related to dyslexia only if there exist an IQ within the norm, or superior to the norm; therefore, they are not independent of the intelligence level.”*

This comment exemplifies a view on dyslexia where IQ is an important aspect. Indeed, as we got more engaged in the project, we realised that some people often stressed that dyslexics have IQ levels within or superior to the norm. This emphasis on IQ levels tended to represent dyslexics as brilliant – but misunderstood – people. This view can be illustrated by one of the replies to a message that shared this pill:

*“in many countries, the problem [with the schools] does not exist. Unfortunately, in Italy... in addition, those who are dyslexic have a medium-high IQ, you can see it in famous people such as Einstein, Mozart, Beethoven, Leonardo Da Vinci, Picasso, Netwon....”*

This view might be influenced by awareness campaigns which represent dyslexic people using example of famous people, such as Einstein, claiming that they were dyslexic. This representation often created tensions with cognitive psychologists, who thought that making children believe that they were kind of geniuses might be as inappropriate as suggesting that they have a disorder. In spite of the fact that cognitive psychologists were also part of the page, the comment expressing disagreement with the message in the content pill received no reply and remained as an act of personal expression (Bennett and Segerberg 2012).



**Figure 5.13** Content pill published on the Facebook page (translated from Italian).

The most successful piece of content seemed to be the stop-motion video created with the bricks: 8,000 people liked it, almost 5,000 shared it, and more than 350 commented on it. We could only see the comments posted on our page, yet these numbers reflected the total actions on our page and on the pages of people who shared the video. Table 5.2 illustrates the differences between the two of them.

Actions such as sharing, commenting and tagging other people could be seen as invitations to become involved, for example, by

supporting or rejecting the message represented in the video. In addition, in the cases in which the video was shared, it travelled outside the digital space of the page where it could shape further discussions on dyslexia.

	On our page	On shares
Likes	548	7425
Shares	4628	85
Comments	28	323

Table 5.2 Facebook Page Data.

The comments on the video generally praised the positive narrative and tagged other people encouraging them to watch it. However, despite the positive message embedded in the video, one of the commenters spotted a dissonant note in it. In particular, she highlighted that the video was “*beautiful*” but “*I’d would like you not to use the term ‘DIAGNOSE’. LET’S USE A SYNONIM: VERIFY... CERTIFY. Diagnosis is automatically associated to a disease and this is not beneficial to our children.*” This comment suggests that the video, together with the page, enabled an opportunity for articulating a concern regarding using the verb “diagnose”, which had been included in the script by the cognitive psychologist and which was aligned with the medical perspective.

Some people, the video seemed to move them to share personal experiences related to dyslexia. For example, a dyslexic person commented on the video by sharing her memories at school:

*“I discovered that I am dyslexic in the 5<sup>th</sup> grade, after an endless series of failing grades in English, History and Geography... When we discovered that I was dyslexic, my classmates mocked me. They said that I was stupid or that everything was an excuse to be helped during the exams. Indeed, some of my friends stopped talking to me because, according to them, I could take the admission test to the university only because I was favoured. Indeed, they had failed all the exams; the only passing grades they had were in those subjects in which they copied. Instead, I managed to move forward always achieving 5 or 6 points and the only favour that I had was that I could use the computer and therefore do not lose some minutes,*

*which were very useful to read the text and the questions...*  
[Facebook page]

The act of sharing this memory can be seen as an attempt to allow people to recognise commonalities by exposing private experiences (Crivellaro et al. 2014). In addition, it can be understood as a call for resilience and hope to those facing the difficulties of being dyslexic. In this way, this message did not call for collective action towards a concrete agenda, but helped people to connect to a personal experience.

For others, the video opened up opportunities to criticize teachers. A few of these comments claimed that they lacked knowledge on teaching and evaluation practices that could help dyslexics. Often the conversations that unfolded in the comments revealed the problematic relationship between parents and teachers. In addition, one comment included a call for action to other parents and against teachers:

*"[...] we [the parents] need to fight against the "teachers" who do not apply the measurements during a foreign language test and, last but not least, humiliate the child with the lowest grade of the entire class."*[Facebook page]

This comment support previous findings, which highlight the role of Facebook pages in sharing implicit acts of political resistance against other forces (Crivellaro et al. 2014). Although there was evidence that some teachers visited the page—information of profession was publicly available in some personal profiles, some teachers reached out in private and some others mentioned the page during the event at the museum—it was surprising that none of them seemed to have ever replied to any negative comment regarding teaching practices and skills, which might have been due to teachers feeling intimidated by the social context of the page.

Indeed, the comment which included a call for action against teachers was a very a popular one in terms of likes. In a follow-up

comment, a mother pointed out that the teachers tried their best with her daughter but the problem was that they did not have enough knowledge. She claimed that this was due to the head teacher who did not support appropriate training. This comment stood out to us as it was the first time that a parent spoke up for a teacher.

The lack of comments supporting teachers suggests that the kind of communication happening in digital platforms might be more suitable for creating spaces for discussion against a main force, such as an institutional proposal (Crivellaro et al. 2014); rather than for enabling the creation of discursive spaces where disputes can be dealt with, as in Things (Binder et al. 2011). Even though digital platforms can help create awareness and raise questions regarding assumptions, supporting the creation of assemblies where people with different views can engage into a dialog might require opportunities, such as events, where people can engage into face-to-face interactions.

### **5.3.2. Reflections on the page**

The Facebook page was of limited utility at facilitating connections among related actors, such as parents and professionals, and it was only during the ‘European Dyslexia Awareness Week’ event that they actually interacted. We believe that the design of the digital platform might have contributed to the limited interaction. For example, the choice of creating a community page, instead of group, might have hindered interaction. Even though people could have commented on the content, it did not happen as often as in groups related to similar topics. This could be related to the fact that people may feel more at ease commenting on content posted by other members rather than by the impersonal and hierarchical ‘European Awareness Week’ profile associated to the University of Trento. However, even within this limited interaction setting, the conflicts between different actors (specifically teachers and parents) became evident.

The available choice of different kinds of pages in Facebook, and their implications in terms of interaction and functionalities, is something to be considered in future

Summarising, the digital platforms became especially meaningful when placed into the context of the project. For example, the possibilities that sharing, commenting and tagging opened in terms of supporting involvement of other people become particularly interesting when compared with the few of them that emerged after seeing the same video at the event. In both cases—on Facebook and at the interactive exhibition—people seemed to appreciate the video; however, the digital platform leveraged the video’s agency of involving people. This highlights that artefacts cannot be considered in isolation; instead, they are assemblies of people, objects and their relations in a form of “object ecology” (Jenkins et al. 2016).

In addition, the differences between enacting the video at the exhibition and on the digital platform placed a specific emphasis on relations and on the influence that they can have on the agency of the components of the assembly. Moreover, the multiple forms of agency of the video can be read through the analytical lens of “artefactual multiplicity” (Bjørn and Hertzum 2011). This notion highlights that single artefacts become a multiplicity when they are enacted by different people, practices and events underlining the importance of exploring the capabilities of artefacts in multiple contexts and interventions. Similarly, the following section will explore the capabilities of artefacts to enable collective action beyond the design project, with an emphasis on forms of involvement and social arrangements.

## 5.4. Considerations on representing

Representing is a process that aims to depict issues and gather relevant actors around those issues. The main outcome is the creation of opportunities for bringing people together through physical artefacts, digital platforms, and events. Representing is a process with a strong focus on constructing – be it digital artefacts, physical artefacts, events. Artefacts that are not purposefully constructed for representing an issue can still be part of representation processes and play a role in depicting the issue or gathering people around it. In these cases, it might be needed to combine the artefact through another artefact that reshape their representation in terms of the research program. This is exemplified in the brochure which shaped some of the artefacts around the event.

In methodological terms, the brochure can be understood as a meta-artefact that allowed to include the outcome of a research program into a different one (Koskinen et al. 2011). Meta-artefacts can be especially relevant for practice-based interaction design research programs aiming to engage with society through design interventions. The focus on interaction design entails that objects presented at these design interventions should provide quality of interaction, which in turn requires time and dedication. Indeed, some of the artefacts were pieces of design research carefully crafted through three-year research projects (e.g. Miniukovich and De Angeli 2015; Menestrina 2017). However, the focus on quality of interaction might jeopardise the feasibility of the design interventions, as the resources required to design interactive devices might be beyond those foreseen within a concrete research framing. In this way, meta-artefacts can be a way to enable practice-based interaction design research within concrete research framings.

In addition, this concept contributes to the discussion on the temporal aspects of designing participation to Things (Ehn 2008; Björgvinsson et al. 2010) by proposing meta-artefacts as a way to enable meta-design. According to (Ehn 2008), meta-design is about building configurable infrastructures composed of multiple blocks that can be combined in different ways. Meta-artefacts extend the scope of these configurable infrastructures to artefacts designed outside, and sometimes before, the design program. These configurable infrastructures aim at facilitating participation by enabling quality of interaction and connecting designers with designers. Even though meta-artefacts can support participation at design and use time, the extent to which they facilitate participation through design-in-use still depends on good environments for design games at use time (Ehn 2008). Aspects related to the ways in which the environment supported design games at use time are discussed in the chapter on reconfiguring.

The events and artefacts attempted to enable participation through exploring alternatives and provoking reflection by asking “what if?” questions (Schön 1983; Fallman 2008). An example would be the alternative lenses, which indeed succeeded at triggering curiosity and engagement. However, the extent to which the event and artefacts enabled participation also depended on the extent to which they were able to elaborate on these provocations. For example, after having fun trying the glasses, often questions were raised regarding the artefacts and their relevance to dyslexia – as “so what?” replies to the “what if?” questions. In these cases, the role of researchers as mediators was critical important, as they elaborated on the conceptual design behind the glasses and facilitated discussions that revealed different views on the role of technology and dyslexia.

Reflecting on these situations might help elaborate on explorative design as an interface with society (Fallman 2008). In this view,

design interventions in societal contexts engage into explorative processes that allow constructing knowledge. However, when considered in society, these explorations happen within an assembly of people and artefacts, or Things (Binder et al. 2011). This influences the way knowledge is constructed and therefore it needs to be considered when designing interventions. In concrete, as part of Things, what if? questions are posed within an assembly and designs (in this case, artefacts and events) should provide the means for people to engage into dialogs. In the event, this dialog was often enabled by the way it was designed, which envisioned that over ten researchers would be in room at all times. Researchers acted as mediators which helped revealing different views and gathering people together, introducing visitors to experts and other researchers.

Reflecting on the process that led to conceptual design of the event and artefacts reveals that it was very much a designers' endeavour. There might have been a few exceptions, as when the members of the FabLab participated in the design of the Wearable Zoo workshop. Indeed, the extent to which spazioD embraced participatory approaches to design was often a concern for us. As a group, the interAction lab is in dialog with the PD community, in particular Maurizio is a very active member; however, embracing a PD approach in spazioD added an extra complexity with which we were not able to deal. In the months preceding the event we speculated what it would mean to embrace a PD approach in spazioD. In concrete, we discussed that this would entail inviting teachers, parents or public officers to take part into design activities and including them into making decisions. However, the practical feasibility of this was limited and influenced by several factors. Among them there was the approaching deadline (the date of the event was fixed since the beginning) and the fact that the decision-making process was lengthy and sometimes unpredictable. More specifically, decisions were taken in weekly fixed meetings - that went on for several

months- and also in emails or phone calls as a response to unexpected situations.

The substantial effort in terms of time and the need to quickly react to unforeseen situations definitely influenced the extent to which other relevant actors participated to the design. However, there might have been a greater reason for which spazioD did not set up the means to engage people into decision making: in spite of the fact that the extent to which the project facilitated participation or exercised control was a recurrent topic of discussion, PD was not part of spazioD research program and we did not engage into reformulating the program to make that happen. An implication of this is that we privileged actions that were aligned with aspects of the research program, such as creating interactive artefacts or bringing people together around representations of issues.



SOMO

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## CHAPTER 6

## 6. Reconfiguring

In the previous chapter I discussed different actions through which we – the interAction lab- tried to bring people together. Building on representing as a two-fold process which entails gathering people and portraying issues (Latour and Weibel 2005), we designed several interventions on the basis of physical artefacts, digital platforms and events. These design interventions facilitated people coming together and revealed different views on dyslexia. This chapter elaborates on reconfiguring, as a process by which people adopt or appropriate design interventions. In concrete, it elaborates on different kinds of actions in which people engaged that suggested a process of reconfiguration while elaborating on the role of the design interventions on enabling these actions.

### 6.1. Reconfiguring at project time

The following sections elaborate on different kinds of actions in which people engaged before and during the event, mostly in the Facebook page, which suggested processes of reconfiguration. This section starts with an overview of the people who joined the Facebook page to illustrate that the page opened up opportunities for reconfiguration beyond the local context.

#### 6.1.1. Expanding the spatial scope

Even though the Facebook page was created as a tool that could help advertise the events and attract the local community, many people outside Trentino seemed to also “like” the page. We had information on people’s locations because Facebook Insights, an analytic tool embedded in Facebook pages, allowed us see the geographic distribution of people involved with the page. We had not planned to use the page as a way to collect data and found

ourselves wondering whether it could contribute to the project. Influenced by our previous research experience on analyzing social media (De Angeli et al. 2014; Teli et al. 2015), we decided to explore the data.

The data was retrieved in December 2016 and showed that the page attracted a total number of 2,410 likes. the distribution of likes over time is reported in

Figure 6.1.

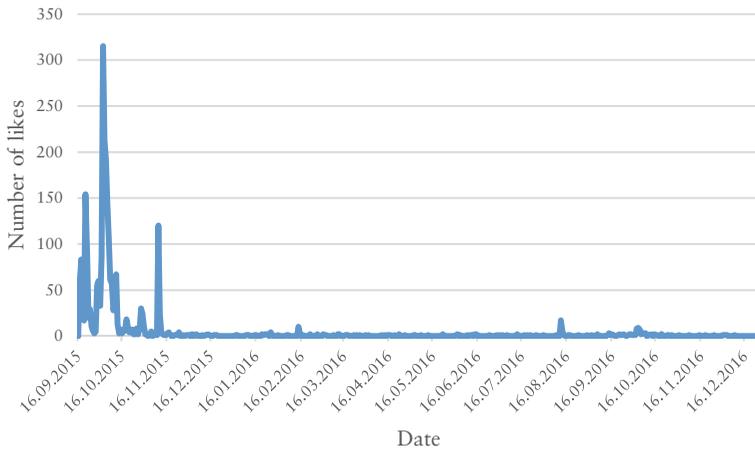


Figure 6.1 Daily new likes over time.

Most of the likes happened during the week of the event. Although there was also another peak almost one month after, corresponding to a post with the video in which we summarised the activities and people’s feedback during the event. This was the feedback collected in the large cardboard boxes at the entrance and exit of the event. This video was intended as a way to establish a dialog among those who attend the event and also those who did not. The relatively high number of people who liked and shared the video – almost 200 people – suggests that people found it

worth sharing with their network. However, it only triggered five comments, most of them praising the initiative. These results suggest a logic similar to that of digitally networked connective action, where people's involvement is grounded on the desire to express personal hopes, rather than on collectively pursuing a common agenda. This suggests that people might not have shared the video to contribute to a collective view of the dyslexia awareness week but as an act of self-expression (Bennett and Segerberg 2012).

The data also showed that the high percentage of people in Trentino-Alto Adige who liked the page was closely followed by the neighbouring Lombardy and Veneto. In general, we were surprised that physical proximity did not seem to be the main factor which influenced liking the page: people located in regions over 600 km away were also present. The interest elicited outside Trentino was even stronger when considering the engagement with the content, meaning the percentage of people who liked, shared or commented on pieces of content. An overview of engagement per region is provided in Figure 6.2.

While attracting people to come to the schools and the museum seemed to be a way to bring affected actors together and thereby open up opportunities for encounters, the meaning of the page for people who could not participate to the event was not clear to us. This opened up questions on how it could contribute to research and on the implications of our actions: Could this data help us infrastructure future interventions which gathered people together? could the page open opportunities for bringing together those who "liked" it? What does "liking" a page means in terms of acting on an issue? The page facilitated involvement to the issue but, by doing so, it also seemed to obscure the meaning of that involvement.

Furthermore, the unexpected number of likes by people in other regions raised a concern about their expectations with regards to

the page and about our responsibilities – as the ones who co-organised the event- on these expectations. Indeed, several comments and private messages inquired about the occurrence of events in other regions. The expectations that design interventions can create on those who are concerned about an issue links back to the discussion on explorative design interventions in society (Fallman 2008) elaborated in the previous chapter. In concrete, it suggests that the increasing interest on design explorations and critical design interventions in society brings along a need for discussing ways in which designers can support those involved with issues beyond the project. In our case, the best we managed to do was answering the messages, informing them that this was the first year we organised such an event and that so far it only happened in Trentino. Reflecting on it, these messages suggested that there was a kind of centralised organization leading the event and therefore might have limited the opportunities for people to engage into the organization of similar events.

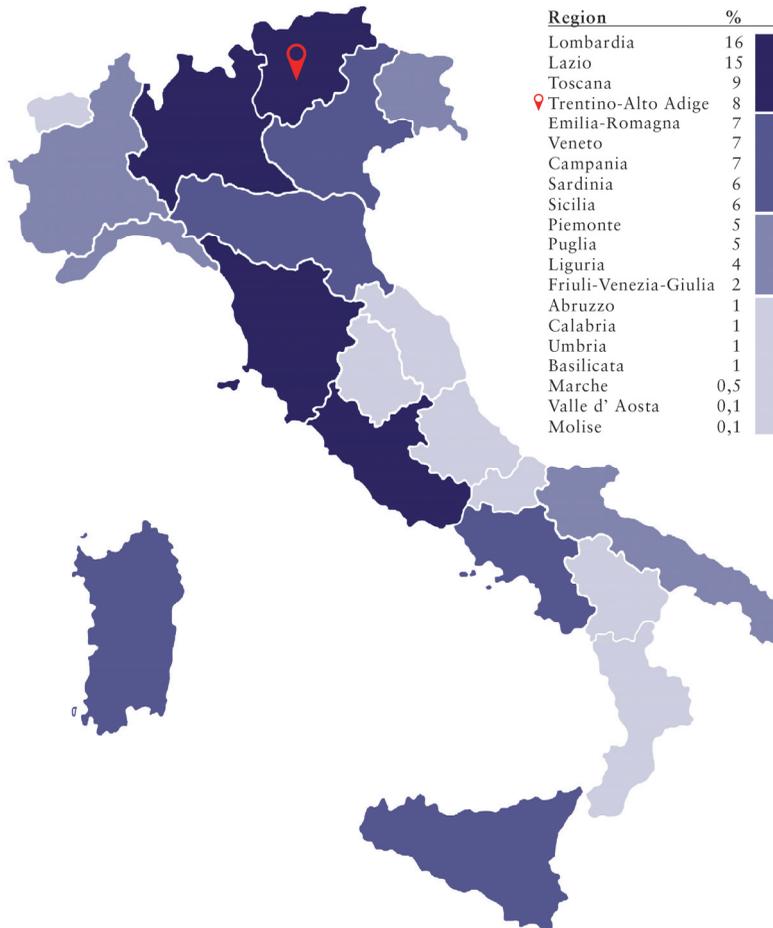


Figure 6.2 Engagement.

### 6.1.2. Exposing forms of involvement

We assumed that if the page contributed to bringing many people outside Trentino together, this would be manifested by many comments on posts and follow ups on these comments. However, this did not happen. In comparison to the number of people who liked the page, the number of comments was quite low. Instead, people seemed to use the page to identify relevant content and distribute it through personal or professional profiles.

Indeed, we found some initiatives which suggested that the page might have inspired some people to proactively engage into creating opportunities for gatherings. Finding these initiatives was not easy, as they did not appear in the page. Instead, we found them by searching for the term “Settimana Europea della Dislessia” in Facebook and filtering by 2015. Most of them happened in the same period of the dyslexia awareness week. These initiatives become particularly relevant considering that performing the same search in 2014 retrieves only three results, which referred to a one-day event at a counselling office in Rome where it was possible to obtain information regarding dyslexia.

Many of the initiatives in 2015 were located in regions outside Trentino. Most of them were presentations for increasing awareness or free tests offers to identify writing or reading difficulties. Some explicitly linked to the dyslexia awareness week by sharing the description of the event. For example, a charity working on psychophysical wellbeing in the area of Florence published the following post:

*“SETTIMANA EUROPEA DELLA DISLESSIA: 5-11 October 2015. The logopedists and psychologists who collaborate with us also open their doors to provide information [link to the website]. The practical, psychological and social difficulties are multiple and can be addressed only through a participatory approach where different people contribute with their skills and knowledge.”*

This post was published including a link to the digital magazine of the University of Trento, where our events at schools and at the museum were described<sup>12</sup>. The increasing number of references to the dyslexia awareness week with respect to 2014 suggests that the page of the event did not only help reach out people but it might have also inspired others to engage into action.

Here I do not mean to claim that educators, psychologists or organizations already providing services regarding dyslexia were inspired by the event to organise initiatives on dyslexia, as this might not have been the case. However, the page, together with the event, might have inspired making these initiatives public, as an act of personal expression and recognition achieved by sharing a common concern (Bennett and Segerberg 2012). Following this line of thinking, the page together with the event can be seen as an easy to personalise action theme that helped people spread the word over their networks (Bennett and Segerberg 2012).

The extent to which interventions were positioned as part of the dyslexia awareness week were influenced by the technological affordances of the digital platform in an intended or unintended way. This point can be illustrated by some other initiatives, which referred to the dyslexia awareness week but did not provide any explicit link to the page. One of the posts published by a centre of neuropsychologists and logopedists in the region of Emilia-Romagna can serve as example:

*“In occasion of the European Dyslexia Awareness Week that will start on Monday the 5<sup>th</sup> we would like to contribute our five cents*

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<sup>12</sup> <http://webmagazine.unitn.it/evento/disi/6495/settimana-europea-della-dislessia>

*to increase awareness on the topic of dyslexia, we have decided to offer part of our time to carry on free screenings [...]"*

For this group of professionals already involved in dyslexia, the dyslexia awareness week constituted an opportunity for exposing their involvement with the issue, highlighting not only their professional dependency but also their commitment. In this regard, it is interesting to note the specific choice of action: making their knowledge and skills publicly and freely available. By temporarily detaching their activities from economical processes, typical of professional forms of involvement, they displayed a kind of commitment beyond their professional dependency (Marres 2007; Le Dantec 2016).

In the post, they also made an open call to other professionals to join the initiative, which prompted a few comments. Some commenters added tags to other professionals, inviting them to consider the initiative. In this way, digital platforms did not only help create opportunities for involvement among relevant actors but they also helped people bring the initiative to the attention of others while suggesting ways to get involved. It is interesting how the affordances of the digital platforms enabled these different kinds of involvement. Although the extent to which they can enable involvement to move forward into action is not clear.

The extent to which Facebook supports calling people to action can be elaborated through the example of a post publicly shared by a person on the 3<sup>rd</sup> of October. The post announced the European Dyslexia Awareness Week, tagged five people and asked whether they would like to organize something related to it. Searching on the Internet we found that this post referred to an association of parents linked to a school in the local region of Veneto. The post generated several comments by some of the people tagged in the post, including the president of the school board and the original commenter. The comments unfolded into a

quite extensive discussion which tackled many different topics, such as the need to organise informative sessions which collectively involved teachers and parents, the importance of the considering the specificity of the local context in those sessions, and the shortage of resources. The discussion finished with a comment that suggested to continue discussing in an upcoming meeting.

The fact that the online discussion was interrupted to be resumed in a physical meeting, along with the initiatives discussed above (presentations for increasing awareness, free tests offers to identify writing or reading difficulties), suggest the relevance of physical meetings. This suggests that, even though digital platforms such as Facebook can help supporting new forms of involvement and bringing them to the attention of related actors, their capability for bringing people into action might influenced by the possibility to combine them with other contexts such as face-to-face meetings, or events.

We also found an initiative which seemed to happen entirely on Facebook. It was an event that appeared on Facebook around the time of the dyslexia week. This digital event was also named “Settimana Europea della Dislessia” and was held between the 5<sup>th</sup> and 11<sup>th</sup> of October, initiated by someone in the area of Rome. As stated in its description, the event was aimed at increasing awareness about dyslexia by inviting people to change their Facebook profile with an image of a famous dyslexic person.

In total, the event was shared with almost 3000 people. It was not possible to discern whether our page inspired this initiative as no explicit reference was available in the text. However, we think that the author was aware of our initiative as she shared a post containing a piece of news published on a Trentinian digital newspaper which covered the events at the schools and at the museum and she explained:

*“it is so sad to browse on the Internet and not to find any initiatives... except for those wonderful ones in Trentino, which we publicise again for the fortunate ones who can attend.”*

Most of the comments on the event page supported the initiative and changed their profiles to different famous people who were believed to be dyslexic, such as Einstein and the singer Mika. However, there was also one post that challenged the invitation to change their profile to a famous person. This post was written by someone who had engaged in sharing pictures of famous people during the week and on the last day she decided to post a photo of her dyslexic son, explaining that he was the most famous and important person in her life. Moreover, she described that this somehow subversive action was aimed at showing that dyslexia was more “*normal*” than what people thought. Finally, she explained that she had been inspired by her son. She described that he had argued that the initiative of posting pictures of famous people was “*little realistic*” as illustrated by her comment paraphrasing her son’s concern:

*“mum, how many [dyslexic] children do you think that will become Mika, who is in the top lists, talks five languages and designs watches?”*

What we see here is that representing dyslexics referring only to those who are publicly recognised by their achievements might be perceived as equally problematic as representing them referring to their weaknesses. Interestingly, this representation acted as a provocation, which prompted reflection and facilitated the articulation of different views.

Among the multiple perspectives gathered around the page there were also some that rejected the initiative. The most articulated example was found in a popular Italian public group on dyslexia where one dyslexic person wrote:

*“In general, I don’t agree with any ‘European weeks’ and in particular I strongly disagree with the European Awareness Dyslexia Week’. If we have these kinds of events, there will always be labels. Furthermore, I believe it is not needed to have ‘weeks’; instead, it is paramount to research and understand that dyslexics don’t need to be ‘helped’ but only need to have opportunities that allow them to achieve high results [...]”.*

This post received several likes and comments. Most of them supported this opinion and argued that the event stigmatized dyslexics. The comments triggered a discussion on different views on the initiative. Some commenters mentioned that it was “*sad*” and expressed their discontent:

*“I was disappointed when I got to know about it because I can’t understand what this is for, which sense it has. They make us feel even worse.”*

However, other people argued in favour of the initiative since “*there is so much disinformation that has been going on during the years*” and praised the value of some of the published content, such as the video.

### **6.1.3. Reinforcing social arrangements**

On the 25<sup>th</sup> of September 2015, just before the beginning of the Dyslexia Awareness Week, DSA Trentino became a formal non-profit association. The members referred to it as the first association of parents of children with dyslexia in Trentino. As indicated on their website<sup>13</sup>, their objectives include supporting, informing, and exchanging information; activating a network where schools and families collaboratively work on encouraging, supporting and empowering dyslexic children’s strengths; and having a voice in the schools to ensure that DSA rights are respected. They had already pursued these objectives as a group; however, by becoming an association, the activities were embedded within an institutional structure. This meant that the

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<sup>13</sup> <http://dsatrentino.altervista.org/associazione/mission/>

group became a new form of social arrangement with a board of members and distributed governance. In addition, this new form of social arrangement allowed them access to specific kinds of resources such as physical spaces and financial support. The availability of these resources was particularly relevant as they could enhance their capability to pursue their objectives, such as organising support activities for children and informative events. Therefore, becoming an association did not only contribute to formalising their commitment but could also to leverage their agency with respect to dyslexia.

Even though the activities in the project did not facilitate the formation of this association alone, as it was something that they had been considering for some time, their decision did have timely connections with our project. Indeed, it was during one of our meetings that they decided to mobilise themselves to formalise it within the following weeks, as they expressed that it was important to be publicized as an association during the event. In this way, organising the event can be seen as an action that contributed to reinforcing the kind of relations among the parents, as they were now part of a formal association, and to other actors and to the issue, as they could now have more support to organise activities and therefore to the emergence of recursive ways of engagement (Teli et al. 2015) which could shape further social structures and undertakings (Le Dantec 2016).

## **6.2. Reconfiguring beyond the initial design**

The following sections elaborate on different actions which suggested processes of reconfiguration beyond the initial design of the event, artefacts and platform.

### 6.2.1. Supporting new forms of involvement

One of the first public activities in which DSA Trentino—now an association—took part in happened shortly after the dyslexia awareness week, on the 30<sup>th</sup> and 31<sup>st</sup> January of 2016. They engaged into the organization of a stand on dyslexia during a two-day regional fair for children in Trentino. The main foci of the fair were ludic, sportive, and handcrafting activities with no explicit link to either scholastic or didactic aspects. This was the first time that they participated in such an event, where most of the visitors were not professionally or personally involved with the topic of dyslexia. This suggests that the event at the museum served as inspirational material for organising this event. They also invited us and the FBK research group that had been present at the event at museum. The motivations for inviting the FBK research group and our group were mediated by the physical artefacts that were at the museum. They asked the FBK group if they could bring the eye-tracking technology and text-to-speech software for narrating text out loud by following a person's gaze (Schiavo et al. 2015). To us, they asked us if we could bring the video game for cognitive training and the alternative lenses. They also invited a psychologist, and two logopedists who sometimes organised training activities for the DSA Trentino to join the event. Considering that we did not have a relation with them before the project, we found it meaningful and gratifying that the relations that had been shaped through previous activities, such as attending to their group meetings and engaging into the organization of the dyslexia awareness week, might have encouraged them to invite us to participate to the event. This participation was also mediated by the artefacts, as they were a central part of their stand and a way to attract people to it.

At the stand, children could draw and play, while parents could talk with the psychologist and logopedists. The alternative lenses were placed on a low table in front of the stand and they attracted the attention of children passing by. While children were trying

out the glasses, the adults accompanying them often started talking with us and asked what the stand was about. The conversations confirmed that most of the visitors did not have a relation to dyslexia and highlighted a general lack of knowledge about it, therefore opening up opportunities for articulation. In particular, even though most people expressed not being certain about the details, most of them related it to a disease. These conversations were also opportunities to destabilise some of the assumptions regarding dyslexia, such as the fact that dyslexia does not imply being less intelligent and that this is not the reason why dyslexic children are entitled to use the computer at school.

### **6.2.2. Events during the Dyslexia Awareness Week 2016**

The 2015 event inspired the organization of two events in Trentino in 2016 which, took place during the Dyslexia Awareness Week. These two events were proactively organised by the university and DSA Trentino and our participation came as response to their requests, in a way that underlined their ownership of the events.

The first event was a one-day seminar co-organised by the ODF Lab and the representatives for equal opportunities of the University of Trento and held at the department of Sociology and Social Research. As one of the organisers explained, the choice of location was partially based to its central position in Trento downtown, which makes it easily accessible to anyone; and that the building hosts the office of one of the representatives. The seminar was titled “Specific learning disorders and university: experiences in UniTrento” and it included several presentations by representatives of the university—university dean and special needs representative—cognitive psychologists and a dyslexic university student.

We were involved neither on the design nor on the organizational activities of this event and only got to know about it when our group was invited to give a presentation on what we had done the year before. The members of the ODF Lab and the representatives for equal opportunities of the University of Trento knew each other before we organised the event in 2015, mainly due to the support that the ODF Lab offers for dyslexic university students, but had never organised an event together. This suggests, that the events at schools and the museums served as inspiration for collaborative organising this seminar.

We were glad to know that the seminar targeted dyslexic university students. In spite of the fact that we had been in contact with some dyslexic university students and one of them helped during the event at the museum, this group had been relatively overlooked in the previous year's edition due to practical reasons. Another difference with respect to the previous year event was that the seminar did not embrace the overall positive and ludic narrative. This might be related to the focus on providing information on academic practices, support services and testimonials and also to the fact that the ODF Lab co-organised the event and, in their view, dyslexia can be mitigated but remains a problem.

Furthermore, in this seminar the involvement of the university took a different with respect to that of 2015. More concretely, in 2016 university's involvement was grounded on its accountability of enabling practices that would support dyslexic university students learning. Therefore, in this edition, the university's involvement took a similar shape to the school in the previous year.

The second event was a two-day initiative led by DSA Trentino. In July 2015, some of the members of the association's board contacted us asking whether we were organising a similar event as last year. We told them that nothing was yet organised and ask

them whether they were interested in organising an event themselves. We do not know whether they had already considered this possibility but embraced it with enthusiasm. A few days after they informed us of their intention to organise an event on the dyslexia awareness week and asked us whether we could meet so we could share our experience organising the previous year's event.

A few days after, we organized a joint meeting at which six board members and myself participated. In the meeting, we discussed aspects related to the previous year's event, such as general organizational issues, and went through the list of artefacts showed at the previous year's exhibition. They were very interested in having video game, the alternative lenses and Lego bricks in their event. In addition, they expressed great interest to be able to access and edit the visual material files, such as the posters and brochures that had been used last year as advertisement for the event. In addition, we discussed the Facebook page and way it had been being used before, during and after the event. To facilitate the advertisement of the event, the board members and myself decided to include one of them as administrator of the page.

During the meeting, we also discussed the people with whom we collaborated for the organisation of the event. Most of them were in their list of contacts, such as the contact person at Erickson, or knew how to contact them, such as one of the researchers at the ODF Lab. Even though they knew everyone, they had not contact everyone so the organization of the event opened up opportunities for interacting with people who played a relevant role on dyslexia in Trentino but with whom they had not yet interacted. Interestingly, they expressed their reluctance about involving the local government as they thought that it might cause more troubles than benefits. Involving the local government might help dealing

with formal procedures or access to physical spaces. However, as an association, DSA Trentino had also access could get these resources on their own. This meeting prompted a collaboration that went on over the next following months over email, as I was not physically in Trento. Moreover, as the day of the event approached, they created a group in an instant messaging platform where I was also included. On this platform, there was a daily exchange of messages with updates on the organization, encouraging messages and questions regarding logistical issues.

The discussion during the meeting and the interactions during the organization of the events suggested that our participation enabled access to the network of actors who had participated in the previous year's event, provided empirical experience on how to organise such an event, and provided access to the artefacts used in the previous year's event.

The event was held on the 8<sup>th</sup> and 9<sup>th</sup> of October 2016 and included workshops and demos for children, which ran in parallel with seminars held by professionals in the domain of dyslexia (Figure 6.3). In this case, the event embraced the positive narrative but lessened the focus on digital technology. In particular, the workshops mostly included hands-on activities focused on assembling, hand drawing and writing. The seminars were mainly targeted at parents and teachers and were held by psychologists, logopedists and adult dyslexics. For this occasion, DSA Trentino had organised the provision of formal certifications of attendance, so teachers could attend to the event and included as professional development activity (cf. 4.2.5). It is interesting to highlight that this subtle action suggests a kind of involvement among parents and teachers different from what we usually observed. More concretely, providing a certification that teachers could use as part of an activity organised by an association of parents suggests a kind of involvement grounded on working together towards supporting dyslexic children.

In addition, the seminar included presentations by one of the members of our group and by one of the members of ODF Lab. Indeed, DSA Trentino and ODF Lab had interacted and coordinated throughout the organization of this event and the event at the university. Interestingly, these two groups had experienced disagreements in the past, even before spazioD started, mainly due to conflicting views on issues regarding dyslexia.



Figure 6.3 Events and artefacts organized by DSA Trentino.

In summary, we found that the design practices enacted during the project did not only support new forms of arrangements but also made existing ones visible. In this regard, the Facebook page and its embedded analytical tool helped reveal the spatial scope of the network of people related to the issue, highlighting the capability

of digital platforms travel across spatial and temporal dimensions. In addition, it revealed existing forms of involvement, as in the case of the professionals offering free tests, placing them within a network of related actors. Finally, the organization of the event required a major effort in terms of resources and time, and would not have been possible without the support of our colleagues who offered their time and help. This highlights the need to be flexible and dynamically allocate resources to adapt to the unexpected practical issues the usually emerge during events (Hillgren et al. 2011).

### **6.3. Considerations on reconfiguring**

Reconfiguring is a process that aims at enabling adoption and representation beyond the initial scope of the project. The main outcome in terms of reconfiguring were the two events organised by the university and DSA Trentino in 2016; and the events and connective actions enabled by the Facebook page. Although reconfiguration processes happen spontaneously, our experience suggests that there are conditions that can facilitate them. These conditions can vary depending on the kind of reconfiguration actions but, in general, they entail access to a network of people related to the issue and availability to access and distribute material used to represent the issue. In the case of the dyslexia awareness week organised by DSA Trentino, these conditions entailed access to network of personal relationships; to artefacts, digital platforms and organizational material of the events; and to the personal experience of organising such an event. Similarly, in the Facebook page, it entailed the availability to distribute the designed material.

The outcome of reconfiguration processes can be very different, varying in the forms in which people engage into political action. In the Facebook page, reconfiguring activities often took the form

of sharing pieces of published material. The logic of these actions did not seem to rely on a desire to contribute to collective action, but rather as an act self-expression with respect to a concern (Bennett and Segerberg 2012). The extent to which these actions can contribute to the formation of publics depends on the extent to which people in these digitally-mediated connective networks can be considered part of publics and, thereby, might require reformulating the meaning of publics with respect to digital media.

In methodological terms, reconfiguring can be understood as a process that provides inspiration for new design interventions outside a concrete framing. The design material and relations that enable adopting and appropriation can be seen as takeaways of a research program, as a kind of a “program for action”. Similar to other takeaways, such as research publications, programs for action are outcomes that travel outside concrete projects to contribute to collaborative efforts. However, the main aim of programs for action is not to contribute to collaborative effort of academic knowledge production; instead, they are inspirational material for adopting and appropriating design interventions.

In spazioD, the program for action included many different activities, interventions and artefacts: from the dyslexia awareness week, to the Facebook page, the visual identity to the network of people. As with research programs, these programs for action are living models which become reformulated over time by those becoming involved. Reformulations in of spazioD’s program for action are exemplified by the seminar organised by ODFLab and the university, which did not adopt the overall positive and ludic narrative; and the two-day event organised by DSA Trentino, which lessened the focus on technology.

One of the challenges in doing so it is to keep a balance between providing a program that can inspire people to act and framing their actions (Benford 1997). Sometimes we did not foresee that the way artefacts were constructed might have entailed too much

control from our side, as when we created a public page on the dyslexia awareness week instead of a group. This hindered the opportunities for appropriation, as exemplified by the fact that DSA Trentino never posted as administrator. This highlights that constructing programs for action should be understood as a collective process. For interaction design researchers, this might entail formulating participatory or co-design processes as part of research programs.

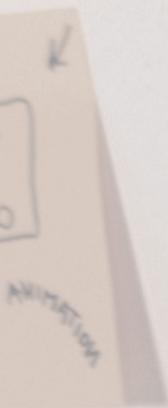
Programs for action can in some cases be appropriated without requiring participation, or even awareness, of the designers, as when people published activities outside Trentino within the dyslexia awareness week. In other cases, or might entail quite an intensive engagement, as the meeting, emails and interaction through private messaging with members of DSA Trentino in preparation for the two-day event in 2016. Before starting such activities, design researchers might need to consider whether they are willing to engage into activities can go beyond the professional life, as private message invaded personal space.



**Team 3.**  
Dyslexics find it very challenging  
that does not include a logic  
information. This includes reminders  
which are arbitrary. This can lead  
avoidance. Design an intervention  
easily recall the names of...



**CHAPTER 7**



## 7. Conclusion

This chapter attempts to answer the research questions: *What design processes can contribute to the formation of publics? What design interventions can enable these processes?* In particular, it addresses these questions by elaborating on the way the processes were enacted in the work presented in this thesis and the way they supported people to gather around concerns. It concludes with final remarks elaborating how this work can be considered for moving forward in investigating ways in which design can contribute to the formation of publics.

### 7.1. Articulating

Articulating the issue of dyslexia as a matter of concern (Latour 2004b) revealed diverse contexts, multiple issues and heterogeneous groups of people and digital technology were entangled (Björgvinsson et al. 2010). Through the research activities, we became part of this entanglement. Our participation within this space did not pursue enabling common consensus or a rational resolution of conflicts; instead, it was meant as an attempt to supporting involvement of different voices and facilitating action on common concerns.

In this space different perspectives on dyslexia were articulated with respect to different contexts—societal, institutional, scholastic, legal—highlighting their multisitedness (Law 2004; Le Dantec 2016). For example, from a societal perspective, dyslexia was as mainly described as an issue that elicited commitment towards the most vulnerable and affected. From a scholastic perspective, it was described as an issue that required institutional engagement because of institutions' accountability on providing a suitable learning environment for children.

In addition, multiple, overlapping and conflicting ramifications of issues, or themes, were articulated among these different contexts and groups of people, highlighting their multifacetedness. For example, in the social context, the construction of DSA as a category was source of uneasiness for children and parents. However, the category of DSA in the institutional context was source of relief and provisioned further scholastic and financial support.

Articulating dyslexia as a multi-sited issue with overlapping and conflicting ramifications also meant constructing a wicked problem, where expertise and ignorance with respect to different aspects of the issue were equally distributed among those people—teachers, parents, public officers—involved with the issue, highlighting a symmetry of ignorance (Rittel and Webber 1973). Indeed, controversies regarding dyslexia in Trentino could be addressed in very different ways, and this thesis provides an account of the way we engaged with dyslexia, which was not planned in advance but unfolded as a dialog, adapting to upcoming issues, opportunities and available resources (Schön 1983; Redström 2011).

The articulation of dyslexia as a matter of concern revealed assumptions regarding dyslexia and shared commitments towards destabilising these assumptions. In particular, assumptions regarding dyslexia as a disease and the effect that these assumptions had on dyslexic children were a shared concern among parents, teachers and public officials. However, these assumptions were so deeply engrained into the daily practices and discourses that they were difficult to reveal. It is interesting to point out that people often resorted to figures of speech such as metaphors (*the computer is for the dyslexic what the glasses are for the short-sightedness*) and analogies (*dyslexia is a characteristic as having curly hair*) to argue against these assumptions providing

an alternative and, thereby, helping articulating different views. These figures of speech can help articulate concerns through design (DiSalvo 2009) because they describe issues and views in figurative ways by referring to objects or actions, which can be represented as artefacts.

The articulation of matters of concern facilitated the emergence of shared concerns and conflicting views among heterogeneous actors. Indeed, the conflicts were strong and diffused among institutional actors (government officers), professional actors (head of schools and teachers) and private actors (parents of dyslexic pupils, non-profit organisations). For example, officers assumed that teachers and parents were mainly responsible for the medical perspective on dyslexia and the lack of a pedagogical intervention. On the other hand, both parents and teachers voiced the lack of political interest to address the issue, openly complaining about bureaucratic inefficiency and incompetency. This strong mistrust against the institutional providers was one of the few points of agreement between teachers and parents, who accused each other of being in denial or lacking the fundamental knowledge to teach dyslexic students.

The involvement of these heterogeneous groups of people to the issue can be read through the lenses of dependency and commitment-based attachments (Marres 2007; Le Dantec and DiSalvo 2013; Le Dantec 2016). As illustrated by parents' commitment to children and teachers' dependency to the local government, these attachments did not only mediate the relation between people and a particular issue but also among different actors and institutions. In addition, they changed over time, as illustrated by the relations between DSA Trentino and ODF Lab; and the involvement of the university as an institution accountable of dyslexic university students.

Furthermore, attachments did not only help in investigating actors' involvement with issues but also emerged as assumptions

regarding others' involvement. Specifically, most people expressed their opinion regarding the way groups of relevant actors and institutions were, or should be, involved. More importantly, the mismatch between these opinions and their assumptions of how they actually participated was often source of conflict. For example, according to many parents, teachers were dependent on the issue because of their accountability on their children's learning. In addition, many of them assumed that teachers did not support their dyslexic children because they did not care or were not even qualified. On the other hand, many teachers expressed a feeling of commitment towards children and dyslexia. However, in their view, this commitment was often not acknowledged or constrained by the regulation on diagnosis of dyslexia or by their lack of training on methods and practices.

In our interpretation, these mismatches, based on generalised assumptions, jeopardised the involvement between parents and teachers, hindering involvement and collective action on shared concerns. In these situations, mediators were perceived as especially relevant because they were able to build relations between loosely coupled actors. This term refers to people or groups of people who are involved on an issue and whose involvement with each other could help addressing it, but in practice their cooperation is limited—as between teachers and researchers—or problematic—as between parents and teachers. In these cases, mediators—such as associations—were described as very important because they could mediate in contested relations—such as the one between parents-local government and parents-teachers.

## **7.2. Representing**

We engaged in representing processes based on events, physical artefacts and digital platforms. Building on Latour and Weibel

(2005), we investigated these processes with respect to their ability to bring people together while portraying the issues at stake.

We found that an important aspect influencing the way issues are portrayed is that representations need to be capable of traversing different social worlds—such as the ones of children, parents, teachers, psychologists and doctors—while remaining open to interpretation. For example, the Lego bricks could travel between events and people and yet remained open for interpretation. More concretely, for children the bricks represented a more versatile object of playfulness, whereas for parents they embedded a metaphor of their dyslexic children. In this way, the artefacts allowed people to easily personalise them to their views.

This was possible due to the characteristics of the artefacts, which lacked self-explanatory elements. However, this also led to delicate situations such as when some parents asked whether the poster showed how their children saw written text. This specific example illustrates a delicate situation, as it was important that the artefacts did not convey misleading information, and highlight strengths and weaknesses of following critical design approaches relying on ambiguity. More specifically, artefacts often benefited from ambiguity since it contributed to designing objects that remained open to interpretation, thereby welcoming the emergence of different views. On the other hand, ambiguous representations can be interpreted as supporting the values and agendas that are actually the object of critic (Bardzell and Bardzell 2013). During the event, researchers often mediated between the artefacts and visitors, elaborating on the embedded metaphors and engaging into discussions, which other visitors also joined. Therefore, physical artefacts could be interpreted across different social worlds when actively mediated by people in the assembly, highlighting once again the importance of mediators. This suggests that prototypes suggesting possible alternatives, or prospects (Seravalli 2013b), should not only be capable of travelling to future states but also among different social worlds.

Here it is important to distinguish between critical design artefacts and art pieces. The inspiration for designing such artefacts comes from the contextual research, interpreted by the individual designer and her concerns through a specific kind of design authorship (Pierce et al. 2015), which can be understood as a design authorship in context. This means that, even though the design of the artefacts depended on the designer's skills and interests (Bardzell and Bardzell 2013), critical design artefacts were not primarily created from building on the inspiration and concerns of the designer. Instead, they are designed through building on collective concerns as articulated by the people who relate to the issue.

In the work presented here, shared commitments and collective concerns inspired the alternative narrative represented in the artefacts, events and digital platforms. This alternative narrative aimed at triggering reflection by challenging assumptions. This specific interpretation of critical design contributes to predictive design by introducing a kind of design tactic (DiSalvo 2009), which challenges a status quo by proposing an alternative agenda aimed at prompting reflection and discussion that can contribute to the formation of publics.

We found that this interpretation offered opportunities but also limitations. It brought forward an alternative that could prompt action. In this way, artefacts might not only represent matters of concern, but also foster agencies of caring (Puig de la Bellacasa 2011). More specifically, caring can take the form of engaging, modifying, or rejecting the proposed alternative. For example, in some cases, people might choose not to adopt the entire agenda but only specific elements. This situation was illustrated by the cognitive psychologists, who agreed to challenge the existing narrative of dyslexia as a disease but did not feel comfortable with the overall positive, and sometimes ludic, agenda; in their opinion

being dyslexic is still a problem. However, the difference between proposing an alternative view and framing that view might be subtle and depend on the way they are enacted.

For example, enacting the alternative narrative of dyslexia as a characteristic on Facebook drove us to create a page, instead of a group. Although the page—and its embedded narrative—might have prompted people to raise their voice against conditions that were assumed to be matters of fact (Latour 2004b), as in the case of the mother who publicly challenged the use of the term “diagnose” when referring to dyslexia, it might have also limited the emergence of different views.

Overall, the comments in which people challenged the content of the posts were particularly interesting. They showed how the page, together with the artefacts and events, contributed to the articulation of problematic aspects of the installed base (Karasti 2014), in the way that collective action could be taken to mitigate undesired outcomes (Dewey 1927) (such as the social construct of dyslexia as a disease). In addition, actions such as sharing, commenting and tagging pieces of content enabled people to become aware of, articulate and problematize issues. In this way, the combination of the actions available in the page, the content and the people who gathered around it provided the means for discovering and expressing attachments (Marres 2007; Le Dantec and DiSalvo 2013). In addition, they enabled the expression of the consequences of an issue and prompted others to enrol in it.

Events were opportunities for gathering to facilitate the emergence of common field of work among otherwise loosely coupled actors. For example, it was through the organisation of the events at schools that our group and the ODF Lab collaborated with schools and teachers. In addition, the design practices resulting in the concrete physical artefacts, and the enactment of these artefacts, created opportunities for emerging attachments. As an example, some of the parents whose children did not yet have the

“diagnosis” of dyslexia had the chance to talk with cognitive psychologists who stood near the “alternative lenses”.

These opportunities could only emerge within an assembly formed by different components such as artefacts, events and groups of people. In addition, the capabilities of these components depended on the particular configuration in which they were enacted. For example, despite the relatively high number of people who gathered around the page, its capability to bring people together was probably influenced by other components, such as the event.

### **7.3. Reconfiguring**

In terms of infrastructuring, reconfiguring can be understood as a process that bridges designing activities envisioned within the design project and those that spontaneously, and sometimes unexpectedly, emerge beyond the project (Björgvinsson et al. 2010). In this way, reconfiguring is similar to other “design-in-use” processes such as adopting and appropriation. However, it also presents some distinctive characteristics. Concretely, reconfiguring places an emphasis on transforming relations among people, rather than on transforming properties of objects, as it is often the case in adoption and appropriation. This distinction is important with respect to the formation of publics because it is through the transformation and reinforcement of relations among heterogeneous groups of people that collective action can happen (Le Dantec 2012).

Analysing the results, it was often difficult to discern whether there was a connection among the emergence of different forms of involvement and specific actions. As in the case of many of the events publicized in Facebook during the dyslexia awareness week in 2015. Indeed, in 2016 the Italian Dyslexia Association organised the “First National Edition of the Dyslexia Awareness

Week” which included more than 600 initiatives at national level<sup>14</sup>. In spite of the fact that we tried to contact them via email and social networks during the organization of the events, we received no reply. The lack of initiatives before the 2015 drive us to speculate that there might be a connection between the two of them; however, we do not know the extent to which our activities might have inspired this event. This uncertainty might pose challenges for engaging with these interventions in HCI research settings, where reliability and generalizability have been important research evaluation metrics. In addition, it raises questions regarding ways to assess projects that create spaces for collective action.

However, digital platforms cannot be considered in isolation. The work presented in this thesis suggests that it is paramount to consider ecologies of artefacts, meaning that their capabilities depend on their co-existence with others, as in the case of the event and the Facebook page. There is also paramount to consider the multiplicity of these artefacts within the ecology, meaning that their capabilities change depending on the configuration of the ecology of artefacts.

Furthermore, our experience allows us drawing some suggestions on strategies that can facilitate processes of reconfiguration to support collective action. More concretely, this work extends the component and protocol strategies presented in (Ehn 2008) with respect to the forms in which they facilitate opportunities for reconfigurations. In our interpretation, components do not only allow reconfigurations at different time – or asynchronous design games (Ehn 2008) – but they also allow reconfigurations outside the scope of the project at the same time of the project – or synchronous design games beyond the initial scope. This is

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<sup>14</sup>[http://www.aiditalia.org/Media/SezioniLocali/treviso/locandine/Presentazione\\_settimana\\_nazionale\\_dislessia.pdf](http://www.aiditalia.org/Media/SezioniLocali/treviso/locandine/Presentazione_settimana_nazionale_dislessia.pdf)

exemplified by the initiatives that were publicised in Facebook during the event in other locations.

Finally, protocols are not only a way to facilitate appropriation and adoption; they also suggest ways and provide the means for people to engage others into collective action. This is exemplified by the dyslexia awareness week format, and how it was collectively enacted by different groups of people in 2016. In this way, events can be understood as kind of prototypes that test activities and also allow collaborations (Seravalli 2012).

#### **7.4. Summary**

In this section I provide a summary of the responses to the research questions and proposes possible paths for research programs investigating the role of design in the formation of publics.

*RQ1: What design processes can contribute to the formation of publics?*

The main contribution of this thesis is the definition of a method following a practice-based interaction design approach for a research program to support the formation of publics. This method proposes articulating, representing and reconfiguring as three intertwining and complementing processes that can support the formation of publics. This thesis proposes that designing for the formation of publics does not only entails enabling each of these processes but also facilitating the means for complementing each other. For example, representing issues through gatherings entails enabling the means for those issues to be articulated. The activities presented in this case study suggest a few examples of how this can be done.

The thesis proposes that the process of articulating aims at creating opportunities for exploring concerns and assumptions regarding people's engagement to issues (DiSalvo 2009; Le Dantec 2016)

while revealing mediators. Mediators are people, or groups of people, who can gather together actors with conflicting views on a shared issue. They are paramount for the process of the formation of publics because they can enable future opportunities for exploring different and conflicting concerns. In addition, this thesis suggest that affect and emotion are important aspects to be considered when designing around issues. Related literature has already discussed their relevance (Le Dantec 2016) and future research on this topic might contribute to better understanding ways in which design can contribute to the formation of publics.

The process of representing aims at gathering people around issues while portraying those issues (Latour and Weibel 2005). The main outcome is the creation of opportunities for bringing people together through physical artefacts, digital platforms, and events. This thesis discusses meta-artefacts, as a way to enable quality of interaction in practice-based interaction design research within concrete research framings. The case study only presents the example of a brochure that served this purpose but these meta-artefacts might take other forms. Investigating which forms these might be, how they can be integrated under a common research program and in which ways they can enable not only processes of representation but also of articulation and reconfiguration might be an interesting path to pursue.

Finally, the process of reconfiguring aims at supporting adoption and appropriation beyond the research program. The main outcome are actions and interventions which allow people, or groups of people, to express their concerns. This thesis proposes programs for actions as takeaways of research programs aiming at engaging people into action. In this work, these programs for actions have taken the form of meetings, shared files, and artefacts. Investigating forms in which these takeaways can be shaped in a way that facilitate sharing, adoption and appropriation might contribute to research interfacing with society (Fallman 2008).

*RQ2: What design interventions can enable these processes?*

The thesis proposes that designing interventions on the basis of physical artefacts, digital platforms and events can enable people to act on an issue. In addition, it contributes with an empirical case study which shows how these design interventions were enacted as part of processes of articulation, representation and reconfiguration.

Even though these design interventions should be holistically approached; they differentiate in terms of the role they play in enabling the processes that support the formation of publics. Concretely, physical artefacts can specially contribute at raising questions, provoking reflection and enabling discussion on assumptions. However, designing in society might not only be about raising “what if?” questions but also about enabling the means to engage into a dialog that can elaborate on “so what?” replies. In this respect, exploring ways in which designs can suggest possible alternatives, or prospects (Seravalli 2013b), might contribute to enable these dialogs.

The affordances of digital platforms can help connecting different people concerned about the same issue. However, the extent to which these actions can contribute to the formation of publics depends on the extent to which people in these digitally-mediated connective networks might be considered publics (Bennett and Segerberg 2012). Exploring the possibilities that digital media opens for political action might entail reconsidering what public and publics formation means in terms of these media.

Events can act as overarching interventions, sometime including physical artefacts and digital platforms, which can enable the emergence of discourse spaces where assemblies of people can engage into dialogs that address their disputes (Binder et al. 2011). The work presented in this thesis suggests that the capability for

physical artefacts and digital platforms to bring people into action might be influenced by the possibility to combine them with face-to-face meetings or events. This suggests that personal interactions still play a paramount role in opening new possibilities for democracy.



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# Notes

