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Disabilities, the design of urban transport systems and the city: a situational analysis¹

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¹ Este es un artículo de reflexión. Presenta un análisis de algunos de los resultados del proyecto "The Design of Urban Transportation Systems" financiado por la Universidad Técnica de Dinamarca mediante una beca de doctorado en el periodo 2007-2010. El análisis aquí presentado es original y no ha sido publicado previamente.

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Abstract

This article deals with the issue of inclusion and exclusion of actors in the development and maintenance of new and existing technologies. I will perform a situational analysis for two reasons. First, I will show that it is appropriate to select as the object of study a situation where two arenas meet: the arena of urban transportation and the arena of accessibility. Rather than being defined by technologies and knowledges, these arenas are defined by concerns: the first one on how best to provide mobility for citizens; the other one on how best to provide accessibility to people with disability. Technologies and knowledges in use will make sense in the set of relations that compose the arenas and their interactions. In this particular analysis I will focus on the attempts of certain actors to make the Transmilenio system accessible to persons with disability.

Keywords: disabilities; situational analysis; knowledges; inclusion; exclusion

Discapacidad, diseño de sistemas de transporte urbano y la ciudad: un análisis situacional

Resumen

En este artículo se aborda el tema de la inclusión y exclusión de actores en el desarrollo y mantenimiento de tecnologías nuevas y existentes. Se realiza un análisis situacional por dos razones: En primer lugar, demostraré que es apropiado seleccionar como objeto de estudio una situación en la que dos campos convergen: el ámbito del transporte urbano y el de la accesibilidad, que en vez de ser definidos por las tecnologías y conocimientos, se definen por las preocupaciones que suscitan: el primero sobre la mejor manera de ofrecer movilidad a los ciudadanos y el otro en cuanto a la mejor manera de proporcionar accesibilidad a personas con discapacidades. Las tecnologías y los conocimientos en uso tendrán sentido en el conjunto de las relaciones que componen los campos y sus interacciones. Este análisis particular se centra en los intentos de algunos actores para hacer que el sistema Transmilenio sea accesible para personas con discapacidad.

Palabras clave: discapacidades; análisis situacional; conocimientos; inclusión; exclusión

Deficiências, desenho dos sistemas de transporte urbano y a cidade: analise situacional

Resumo

Este artigo lida com a questão da inclusão e exclusão de atores no desenvolvimento e manutenção das tecnologias novas e as existentes. Vou realizar uma análise situacional por duas razões. Primeiro, demonstrarei que é apropriado escolher como objeto de estudo uma situação onde duas arenas se encontram: a arena do transporte urbano e a arena da acessibilidade. Ao invés de serem definidas por tecnologias e conhecimentos, tais arenas são definidas por preocupações: a primeira sobre como fornecer uma melhor mobilidade para os cidadãos; a outra sobre como fornecer uma melhor acessibilidade às pessoas com deficiências. As tecnologias e conhecimentos atuais terá sentido no conjunto de relações que compõe as arenas e suas interações. Nesta analise particular estou me focando nas tentativas de certos atores para tornar o sistema Transmilenio acessível a pessoas com deficiência.

Palavras-chave: deficiências; analise situacional; conhecimentos; inclusão; exclusão

Introduction

On August 1 of 2002, the Constitutional Court of Colombia ruled in favor of citizen Daniel Arturo Bermúdez Urrego. He had sued the transportation company Transmilenio S.A. for not taking into account his condition as a person with disability in the design of the Transmilenio system in Bogotá. The legal decision forced Transmilenio S.A. to invest in the necessary modifications in order to guarantee the accessibility of persons with disabilities to all parts of the system. Transmilenio S.A. was also required to provide a regular report to the Asociación Colombiana para el Desarrollo de las Personas con Discapacidad, ASCOPAR (Colombian Association for the Development of Persons with Disability) on continued progress in modifications of design and improvements to the system so as to guarantee accessibility for persons with a range of disabilities.

Bermúdez Urrego's attempt to influence the design of Transmilenio was neither the first nor the last in Bogotá's history. Nonetheless, it stands out as a rare example of a successful attempt at the inclusion of persons and groups that are regularly excluded from the design, operation and use of technological systems in our societies. I address in this paper the question of how to account for the attempts of implicated actors to influence the designs of systems. Implicated actors are those actors that are affected by new or existing technologies and knowledges. Despite their position, they are frequently "silenced/ignored/made invisible by those in power" or they are only "discursively constructed and discursively present" (Clarke & Leigh Star, 2008). Implicated actors, however, sometimes do attempt to influence the development of new technologies and knowledges. In other words, they might attempt to rebel against their lack of agency. In this paper I analyze one such case.

To account for the actions of implicated actors, I will perform a situational analysis following Adele Clarke's methodological developments (Clarke, 2005). This is appropriate in this case for two theoretical reasons. First, from a Science and Technology Studies point of view, I will show that it is appropriate to select as the object of study a situation

where two arenas meet: here, the arena of urban transportation and the arena of accessibility. Rather than being defined by technologies and knowledges, these arenas are defined by concerns: the first one on how best to provide mobility for citizens in Bogotá; the other one on how best to provide accessibility to people with disability. Therefore, technologies and knowledges in use will only make sense in the set of relations that compose the arenas and their interactions. In this particular analysis I will focus on the attempts of certain actors to make the Transmilenio transportation system accessible to persons with disability.

The second theoretical reason for this choice is that in disability studies, there is an increasing focus on the situation as the defining concept. Rather than attributing disability to a medical condition of individuals or to the social conditions of the contexts in which they live, theorists are increasingly focusing on the *situations* where persons might find themselves dis-abled in one way or another. In other words, disability is the result of a complex interaction between individual and contextual factors (Shakespeare, 2008). Conditions also change constantly; they are dynamic (García, Carrillo, Cobos, & Santacruz, 2007). Therefore undertaking an analysis that starts from the situation provides the opportunity of accounting for the dynamics that constitute disability. In this case, I will show how persons with disability did not have access to the feeder routes, but they did have access to the trunk lines of Transmilenio: they were disabled in the situation of gaining access to all parts of the transportation system. Rather than accepting their role as passive implicated actors in this situation, they resisted, and actively sought to intervene in the situation.

I will show how the effort of Daniel Arturo Bermúdez Urrego bore fruit because of certain conditions in the arenas of transport and accessibility in Bogotá. These conditions are: the previous efforts by other persons like Fernando Gaitán and Gustavo Martínez to influence the built environment and the design of Transmilenio; the support given to Bermúdez Urrego by ASCOPAR; the existence of the *tutela* as a legal instrument in Colombia; and the constitution of Transmilenio as a state owned company with full responsibility for providing mobility to the citizens of Bogotá. I will account for these developments

and how they lend their support to the actions of Bermúdez Urrego. Therefore, my main claim and contribution to the field is that under special conditions rebellious implicated actors can achieve change in the design of big technological systems, even in the absence of organized collective action.

The analysis is organized in four sections. First, I will present the foundation for this situational analysis. Second, I will briefly present and describe Gaitán's and Martínez's attempts to intervene in the arenas of accessibility and transport in Bogotá. Third, I will account for the success of Bermúdez Urrego in transforming these arenas through a *tutela*. And finally I will conclude and suggest future lines of inquiry.

A situational analysis of accessibility to public transportation in Bogotá

I have chosen situational analysis for this case for three reasons: because disability studies in Euroamerica and in Colombia have shifted focus to the situation as central to their studies; because it enables the analyst to focus on personal and collective action; and because it provides a set of tools to deal with complexity.

The medical theory of disability has been strongly criticized and deconstructed during the last five decades. Within disability studies, very few scholars would still defend, theorize and illustrate how disability is due to a medical condition that should be treated to remove the disability and normalize people. However, as other studies show, in medicine and medical technology there is still a strong desire to help people with certain disabilities to overcome them (Blume, 2009; Mauldin, 2014). Instead, a lot of work has been done on what is called the social model of disability. Disability arises from what in a given society has been constructed to be a disability. The most striking example is being blind. We live in a society that is strongly visual. Therefore, people that have reduced vision or are blind are disabled, not because they can't see, but primarily because they are required to see to per-

form even the most banal daily activities. There are efforts to remedy this situation and that is why we have modifications in the layout of our cities, in the design of traffic lights and other features of urban space, so blind people are not disabled by their environment.

Tom Shakespeare, a major figure in disability studies, has argued recently that the social model is inappropriate because “it creates a straw person and suggests that medicine is undesirable” whereas “it is not medicine, but inappropriate medicalisation which is the root of the problem” (Shakespeare 2008, p. 11). Additionally, he judges that focusing only on the social aspects of disability is simply the wrong strategy. He states, “it fails to capture the complexity of disabled people’s lives” (11). Moreover, he claims “disability is always an interaction between individual factors—predominantly impairment, aspirations and motivations— and contextual factors—environments, policies, barriers and so forth”. This means that it is produced from a combination of impairment and social aspects. This is what policy makers on disability in Bogotá call the situation.

In fact Solángel García, María Victoria Carrillo, Ana María Cobos and Martha Santacruz from the special group on disability of the Public Health Unit in Bogotá have based the policies in Bogotá on a situational model of disability. For them, disability is the result of medical and social conditions that can change. It considers individuals as open systems. Their capacities and disabilities and their quality of life are influenced both by their impairments and the contexts in which they live. They build this understanding on the work of Alicia Amate’s developments for the Panamerican Health Association. These developments are also in accordance to those of the World Health Organization with which Shakespeare also agrees.

Situational analysis departs from the question “Who is authorized and not authorized to make what kinds of knowledges about whom/ what, and under what conditions?” (Clarke, 2005) . This is a question, which also interests “postcolonial, feminist, diasporic, ethnic, queer, multicultural and “other” theories and studies”. All these types of studies focus on populations that in one way or another suffer

from discrimination. In the field of Science and Technology Studies our interest has been in how differences are naturalized in scientific knowledges and in technological systems. The call to focus on different knowledges is fundamental because situations are constituted by different persons, collective actors and institutions, all of which make claims about what is legitimate knowledge and what is a valid course of action based on that knowledge. Discrimination, thus, does not follow from any essential feature of the actors involved or the contexts they live in, but out of their interactions.

Central to Clarke's presentation of situational analysis is the role of implicated actors. One of the main aspects of any given situation is that there are patterns of collective action. Collective action is understood in relation to social worlds, which are collectives associated around any kind of constituted organization, social movement, professional identity or established activity. Persons belonging to social worlds act in their representation. This does not mean however, that identities are framed essentially by the affiliations of persons. They are also framed by the kind of interactions they attempt and establish in a given situation. For example a doctor may act as member of a particular association, as an expert in a certain medical specialty or as a father of a patient depending on the situation. However, Clarke states that any set of people diagnosed with particular conditions and patients in general will not become collective actors, the special focus of social worlds/arenas analyses. This absence of collective identity to act together among patients has been a key aspect of understanding many medical practices historically, especially how patients are situated differently from medical professionals (Clarke, 2005) .

For Clarke this contrast between collective actors and implicated actors depends on their capacity to influence the situation. Nonetheless, she clarifies that under certain conditions patients and their families can become social worlds when they organize themselves. In doing so they can achieve the power to influence the situation that affects them. These processes normally take time. Callon and Rabearisoa (2008) describe this kind of development in their analysis of how patients with neuromuscular disease and their families fought and won the right to

influence the research agenda on their own disease in France. In their case, the process took several decades. In the case I am analyzing here, I will show how individual persons, loosely related to collective actors, can also achieve influence, but only under certain conditions.

The following aspect to clarify then is what constitutes a condition that enables action. Clarke's situational analysis builds upon a long tradition in symbolic interactionist sociology. Susan Leigh-Star and Adele Clarke have synthesized the roots and main concepts of this theoretical development in what they call a "Theory/Methods Package" (Clarke & Leigh Star, 2008). Central to this package is the process by which the interaction among social worlds might produce developments in any given arena that can be stabilized over time. These can become 'boundary infrastructures': stabilized sets of relations that constitute a given arena or that mediate between different arenas. These boundary infrastructures determine partially the conditions of possibility of social actors and individuals in any given situation. But it is important to remember that there is a lot of work required to be done by other social worlds and individuals to maintain those infrastructures in place. Therefore, in situational analysis, infrastructures are not obdurate in themselves, but become so as a consequence of work. Non-human actors can also produce work. These are devices, design features, standards and accounting systems, which enable or prevent others' actions.

In the case of Bogotá, I will describe how Transmilenio became a boundary infrastructure in the arenas of transportation and accessibility and how persons with disability rebelled against their condition of implicated actors. I will do this in two steps. First I will introduce and describe the arena of accessibility in Bogotá in relation to transportation and the built environment. Second, I will present the arena of transportation, how Transmilenio became a boundary infrastructure and Bermúdez Urrego's successful performance in this situation.

The current analysis is based on interviews with Mauricio Gaitán, Gustavo Martínez, and members of the INCI and ASCOPAR and through a revision of the documentation associated with the juridi-

cal process. It would have been even better to have an interview with Daniel Arturo Bermúdez Urrego, but it was not possible to locate him. This study has also profited from an extensive research on the design of Transmilenio and access to its institutional archives and interviews with several members of the design team of the system (Valderrama, 2009; 2010).

Situational analysis invites us to produce schematic diagrams that represent the situation. The following diagram (Figure 1) summarizes the argument of this paper. I will walk the reader through the elements and the interactions represented. The diagram is schematic and incomplete. It is an attempt to organize the analysis in ways that can be understood. In that sense, there is a necessary reduction and projection. Therefore it cannot claim to represent reality. It is an analytical and communicational device designed to represent this analysis.

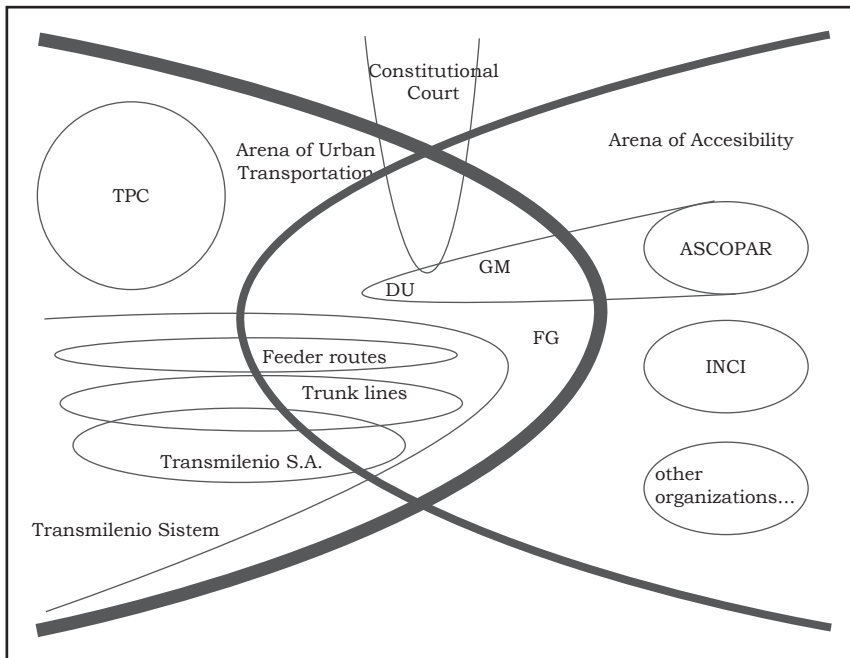


Figure 1: Visual diagram of the analysis.

Source: own work.

Arena of accessibility: where implicated actors remained implicated

Accessibility to public transportation in Bogotá has improved during the last 15 years. But the fact that new accessibility devices are now more visible in the city, does not mean that the way they got into place was uncontroversial; quite the contrary. It was first with Transmilenio that any kind of accessibility to persons with disability became operational in Bogotá. The date of inauguration of this transportation system was the 4th of December 2000. Transmilenio is a bus rapid transit system (BRT). This means that it is a bus based transportation system that incorporates many of the features that were previously present only in train based transportation systems around the world. These features are: the buses run in exclusive lanes, they have the right of way; the buses stop only in bus stations (and not bus stops on the curb side), that operate similarly to train stations; passengers pay the fare upon entering the station and not the bus; and when the bus stops at any station it opens four sets of doors on the side allowing for fast boarding like in train systems. Like many urban train systems Transmilenio is coordinated by a central company; it benefits from a strong branding strategy, which makes it a very visible part of the city; and it promotes a strong user-oriented discourse. Like some urban train systems in the world, Transmilenio also includes a number of feeder routes in order to expand coverage and concentrate demand (Ardila-Gómez, 2004; Shane, 2006; Valderrama, 2010).

During the design of the first phase of Transmilenio (1997-2000), many persons, companies and interest groups were invited to provide their input to the process: there was a core group of planners; established consulting companies like Steer Davies and Gleeve and MacKinsey Consulting; several of the existing bus companies; and there were also a number of public hearings to involve the citizens of Bogotá in the planning phase. Among the persons that were heard was Mauricio Gaitán. Gaitán is blind and during much of his adult life, he has been engaged in studying and campaigning on how to modify the built environment and the transportation systems to provide accessibility to the

blind and people with other types of disability. He has a relationship to the Instituto Nacional de Ciegos INCI (National Institute for the Blind), but does not necessarily represent that institution. Like many other activists he is also committed to universal access: guaranteeing that any person with any disability will have the same access opportunities as any other person in the city. His suggestions about signage for the blind were heard by the planners of the design team of Transmilenio, but were not incorporated into the design of the first phase of the system.

Gustavo Martínez is a civil engineer who became dependent on a wheelchair after an accident at the beginning of the 1990s. As an engineer, Martínez has since been struggling to influence the design of standards and regulations to make the built environment accessible for people with different needs in Bogotá. He describes his struggle as ‘extremely difficult’ and ‘unrewarding’. He clarifies that it took him several years to “get the Instituto de Desarrollo Urbano – IDU (Institute for Urban Development) to even allocate him a desk to work”, because all his contributions were voluntary and unpaid. In these conditions nevertheless, Gustavo Martínez has succeeded in influencing the production of a number of regulations for the future development of the built environment. These regulations deal with how to build and develop parks, sidewalks, parking places, and public transportation systems include specifications to take into account the necessities of persons with diverse disabilities. The development of regulations may or may not influence actual construction in Colombia. Martínez thinks it is a necessary work; but he would also like to see things become material reality. As an engineer, Martínez is also aware that there are limited resources and that “persons with disability cannot expect to be provided with a technology to be transported door to door without themselves making some effort”. Martínez is also a member of the Asociación Colombiana para el Desarrollo de las Personas con Discapacidad - ASCOPAR (Colombian Association for the Development of Persons with Disability). This organization focuses mainly on supporting the development of people with disability through sporting activities. Although it also has an interest in achieving better conditions in the city, this is not its main objective as an organization.

Despite Gaitán's and Martínez's -and many others'- efforts during the 1990s, their voices were not taken into account in the final designs of Transmilenio. The first phase of Transmilenio included a number of devices to allow for accessibility. Concretely the trunk line stations were provided with ramps; the buses that service the trunk lines and the stations have the same height; at the entrance of the stations there is a special wide door to allow access for persons in wheelchairs; and each bus has two places inside the vehicle to park wheelchairs and secure them with a safety belt. However, the buses of the feeder lines serving the inner parts of some neighborhoods do not have these advantages of accessibility. As a consequence, the system discriminated – people who lived close to the trunk lines had better access to the system than those who did not.

“Go live close to the trunk lines!” (Redacción DISSNET, 2005) was the aggressive response of former Mayor of Bogotá, Enrique Peñalosa, when individuals with disabilities, associations and journalists started to complain about the lack of accessibility to the feeder buses. This was certainly an unexpected statement by the person who had built an image of himself as the great re-builder of Bogotá as an inclusive city (Ardila & Menckhoff, 2002). It could be argued that in a city that had traditionally ignored people with disability altogether, Peñalosa's reforms constituted a whole revolution. In fact accessibility was, up to the 1990s, a very modest achievement in the city as a whole. Furthermore, in Colombia people with disabilities were not recognized as full citizens until the Constitution of 1991. Structurally, Colombia and Bogotá were not accessible for people with disabilities. In social worlds/arenas theory, structures are “the enduring temporal conditions of situations” (Clarke, 1991, p. 129). That was the case with the public collective transport (more detail on this in the next section). Fortunately, conditions can change. And in the case of accessibility in Colombia, there was a great improvement first with the Constitution of 1991 and then with Transmilenio. However, the point in this paper is that Transmilenio was not designed *with* people with disabilities and neither was it conceived *for* people with disabilities in its entirety. Therefore different levels of inclusion were achieved in the arenas of accessibility and urban transport.

For example, the devices that permitted access to the trunk lines were incorporated, not because of local influences, but rather because the international referent for the design of Transmilenio already had them. Transmilenio, in fact, was strongly inspired in the Rede Integrada de Transporte RIT (Integrated Transportation Network) of Curitiba, Brazil (Ardila-Gómez, 2004). The RIT is a comprehensive system using a range of technologies. However, the city of Bogotá focused on and copied only the Bus Rapid Transit part of it. Although some degree of integration was achieved with the feeder routes, this integration did not take into account the needs of persons with disabilities.

Copying regulations or parts of regulations or some parts of a reference system is unfortunately a frequent practice in Colombia. For instance, the standards for accessibility included in the regulations for public space development draw heavily on the regulations of Spanish cities (Acosta, 2010, March 10th. Personal communication). Therefore the space regulations normally do not come from a local discussion on how to provide accessibility to the different social groups and communities in the country, but from ready-made international referents. Similarly, the arena of accessibility in Bogotá also takes international referents into account. But unfortunately, sometimes these referents are privileged as an input to the development of local regulations over native contributions. It has even been argued that, by assigning greater value to international standards than to local knowledge production processes we end up enforcing a colonial relationship (Castro-Gómez, 2005; Lander, 2009).

People like Mauricio Gaitán and Gustavo Martínez were active in the arena of accessibility in Bogotá. They made efforts to influence the development of the city and its infrastructure to improve accessibility. But those who had the responsibility for the infrastructure (i.e. IDU) as well as those who had the chance of re-shaping the mobility infrastructure (i.e. Transmilenio's design team) did not take Gaitán's and Martínez's efforts into account. As a result Gaitán and Martínez remained implicated actors: they were affected by the designs of Transmilenio, but despite their efforts, they could not influence the design. Others actively downplayed them in the continuous process of

shaping and re-shaping the city and its infrastructures. It is here, in the situation where the arena of accessibility and transportation meet that exclusion was created. Like many others they attempted to enroll other actors in the arena to accumulate more power of influence, but their efforts were fruitless.

In Figure 1, I have represented them as individuals acting at the intersection of the arenas of accessibility and transportation. Together with Daniel Arturo Bermúdez Urrego, Gustavo Martínez and Fernando Gaitán acted mainly as individuals in this situation. Although they had relations to organizations of people with disability, these organizations did not engage directly in their efforts. The organizations were more interested, at the time, in fulfilling other activities. It is tempting to say that this lack of support explains their failure. However, in the next section I present and analyze Daniel Arturo Bermúdez Urrego's successful attempt. I claim that it was both his strategy of using the legal instrument of the *tutela* and the nature of the legal constitution of Transmilenio S.A. that explain his success. Both these features relate to historical dynamics in the arenas of accessibility and transportation in Bogotá.

Arena of urban transportation: where an implicated actor rebels against his condition

On 28 February 2001, Colombian citizen Mr. Daniel Arturo Bermúdez Urrego sued Transmilenio S.A. for not guaranteeing him accessibility to the feeder routes of the transportation system. Bermúdez used the legal instrument of *tutela*, which was established by the country's constitution of 1991. This legal instrument allows individuals to sue other individuals, organizations or the state itself, if their basic rights are violated. Mr. Bermúdez argued that Transmilenio S.A. had implemented only partial accessibility to people like him, with disabilities. Although access was guaranteed in the trunk lines, a feeder route that passed very close to his home had no devices to facilitate access for persons in wheelchairs. Consequently he had

to travel in his wheelchair 15 blocks through a hostile urban built environment to reach the part of the system where he could actually have access. His argumentation was supported by various laws, decrees and technical norms developed during the 1990s, which mandated the provision of accessibility for people with disability to all services, including transport (Cepeda Espinosa, 2002, p. 2). As described above Mauricio Gaitán, Gustavo Martínez and the groups they sometimes represented had influenced some of these technical norms.

Transmilenio S.A. argued that the transportation system was composed of two different technologies: the trunk lines with new buses, new stations and all the devices to facilitate access; and the feeder routes, which basically complied with the requirements of the Ministry of Transport for companies that provide transport service in the traditional Transporte Público Colectivo – TPC (Public Collective Transport). Transmilenio S.A. also argued that the company was pursuing a program of improvements to comply with the legislation, but that the costs of full accessibility threatened the economic sustainability of the system as a whole, and that increased costs would entail higher prices for all passengers (Cepeda Espinosa, 2002, p. 4). The judge ruled in favor of Transmilenio S.A. on 15 March 2001. The basic argument was that transportation companies should proceed to develop full accessibility, but through a technically and economically sound process, and that such actions should be exempted from the preemptoriness of legal actions like the *tutela* (Cepeda Espinosa, 2002, p. 5). This first decision rendered the attempts of Bermúdez Urrego unsuccessful. He remained an implicated actor after this first effort. He could still use Transmilenio, but only if he could reach the trunk lines by himself. The system was shaping his conditions of possibility, while his efforts to shape the system were failing.

However, Mr. Bermúdez did not accept the decision and resubmitted his *tutela* for consideration at the Constitutional Court. The court magistrates considered the whole case and ruled in favor of Mr. Bermúdez on 1 August 2002. The court interpreted the situation in the following juridical terms:

Can the company in charge of the management, organization and planning of the transport service in a city ignore the right to equality, liberty of locomotion and protection of a special person who lives in a marginal area, and who uses a wheelchair because of disability, and who does not have access to transport because of his condition? (Cepeda Espinosa, 2002, translated from Spanish by the author).

Magistrate Manuel José Cepeda Espinosa developed an extensive argumentation, bringing in examples of diverse sectors to demonstrate that despite the fact that legislation and technical norms were still in the making, the public company Transmilenio S.A. should guarantee access to the feeder routes to Mr. Bermúdez. This should be accomplished by the immediate installation of wheelchair elevators in feeder buses (Figure 2) and through the development of an access plan in a period of no longer than two years. Transmilenio S.A. was also mandated to report progress every three months to the Asociación Colombiana para el Desarrollo de las Personas con Discapacidad (ASCOPAR: Colombian Association for the Development of Persons with Disability) (Cepeda Espinosa, 2002, p. 33). It must be clarified that although ASCOPAR supported Bermúdez Urrego's legal action, they did so upon request and not as part of their mission. As explained above, ASCOPAR's main work is other than to lobby for the betterment of conditions for people with disabilities.

This was the first time in Colombia's history that a transport company was forced to provide access to persons with disability in wheelchairs. It is noteworthy that Bermúdez Urrego's success builds on three developments of the arenas of transportation and accessibility: first, it is the previous efforts of people like Gaitán and especially Martínez that have pushed into the regulations and the legislation a more explicit consideration for people with disability; second, the existence of the *tutela* as a legal instrument which only makes sense if there exists a right to mobility in the constitution of the Colombian state; and third, the particular constitution of Transmilenio S.A.; because one could ask: Why was Transmilenio S.A. liable to comply, while many other companies, which had been operating for decades, did not (and still do not) comply?

In the previous section I have given detail about the efforts of Gaitán and Martínez. Regarding the *tutela* and the work of the constitutional court, I have chosen to represent this as a social world in figure 1. In the abstract, one might expect that the Constitution of Colombia would be the general foundation of the country framing the constitution of any and all arenas. However, what situational analyses show, is that a body like the Constitutional Court only appears in a situation if they actually do something, if they act within that particular situation. In this case, the Constitutional Court was brought into this situation at the intersection of the arenas of disability and urban transportation due to Bermúdez Urrego's use of the *tutela*. Otherwise, neither the Constitution nor the Court would have had any influence in the situation. And in fact that was the case during the previous decades (and it is still the case in many other situations).

I have explained in detail elsewhere why and how the *transporte público colectivo* (TPC) colonized the arena of development for transport in Bogotá (Valderrama, 2009). That is why it is represented as an important part of the arena of transportation in figure 1. This system or mode of transport was characterized by unclear distribution of legal responsibilities among the city, the company owners, the bus owners and the drivers. Castañeda's (1995) account of the history of the TPC states that throughout the 20th century it became legally over-regulated, while its material and organizational structure made it physically and economically under-regulated. For instance, in case of an accident or a traffic infraction, it was the driver who had civil and penal responsibility, while bus and company owners did not.

For the purposes of my argument, I will describe a few salient features of the TPC. The TPC was based on a semi-competitive model in which bus companies managed routes with a high degree of superposition: many routes used the same corridors or parts of corridors (Valderrama, 2009). This arrangement produced competition among bus drivers for passengers, and thus encouraged aggressive driving behavior. Drivers would pick up passengers anywhere on the curbside, making official bus stops completely irrelevant. The vehicles complied precariously with an also precarious vehicle standard. The majority of

the buses were composed of artisan and semi-industrial bodies mounted over truck chassis; they had a very narrow door, which segregated persons with disability. The organization of the TPC did not allow for regularity. There were no schedules, but frequency was high, so passengers' waiting times at the curb were short. However, blind people could not wave to their buses without help. The TPC was regulated by the Secretaría de Tránsito y Transporte – STT (Secretariat of Transit and Transport), which became a very weak regulatory body captured by the interests of the bus companies (Ardila-Gómez, 2004). This is one of the reasons that explain why the arena of accessibility was so weak in relation to urban transportation systems before the design of Transmilenio.

The designers of Transmilenio conceived many of the features of this transportation system to specifically address the many problems that the TPC presented. One such problem was the unclear distribution of legal, operational and economic responsibilities among the main actors that compose the system. This is the motivation behind constituting Transmilenio S.A. as a managing and operational company with full responsibility for the system as a whole. In fact, the City Council established Transmilenio through agreement number 4 of 1999, which made this institution responsible for “planning, managing and controlling the system”. The nature of the organization of the system, with Transmilenio S.A. as the coordinating company and private operators as owners of the bus fleet, made it a public-private partnership, which acted as a managing and executing company, not merely as a regulating agency, like the previous STT. Accordingly, and this was part of the argumentation of magistrate Cepeda Espinosa, Transmilenio S.A. could not avoid the responsibility for providing access to Mr. Bermúdez as the traditional companies of the TPC had done until then.

The analytical point here is that Bermúdez Urrego was able to positively influence the arenas of accessibility and transport thanks to various other developments. They were: First, the existence of a national constitution that provided the legal instruments to take other actors to court. And second, the design of Transmilenio, which exhibited two key elements: on the one hand it guaranteed accessibility in

the trunk lines and on the other Transmilenio S.A. was designed and enforced as a public company with full responsibility for operation and management of the system. This combination of developments in the arenas explains why the actions of Bermúdez Urrego could be more successful than those of his predecessors. Bermúdez Urrego ceased to be an implicated actor when the Constitutional Court ruled in his favor. He no longer had to accommodate himself to the system. The system was modified to accommodate to his needs as a person with disability.

Conclusion

Social Worlds/Arenas theory and its associated Situational Analysis methodology offer a package to study the dynamics of co-development of knowledges, technologies and social relationships. One of the main features of this package is that it invites analysts to focus on dynamics of inclusion and exclusion. The particular recommendation in the methodology is to look for silences and processes of silencing of individuals and collective actors. The theory proposes that in any given process of knowledge and/or technology production there are always implicated actors: those who are affected, but who cannot influence the processes. In this paper I have focused on three cases of implicated actors in the development of the arenas of transport and accessibility in Bogotá. I have shown how they all attempted to refuse their condition as implicated actors. I have described their efforts to influence the situation and I have given an account of how one of them managed to succeed, under specific conditions.

One important aspect of Bermúdez Urrego's success was that it happened in spite of a lack of collective organized action. He sued Transmilenio S.A. as an individual, although he was part of ASCOPAR and very active in other disability organizations. This was possible because of the definition of the *tutela*, the existence of the necessary legal framework and perhaps his luck in having a very competent and serious magistrate, Manuel Cepeda Espinosa, presenting and defending

the case at the court. ASCOPAR and other organizations supported Bermúdez Urrego's initiative, but they did not take the lead in the process. It was not ASCOPAR vs. Transmilenio, nor did Bermúdez Urrego act as the representative of ASCOPAR. So, in this case, an individual led a process that brought together other individuals and organizations but only around this particular situation. Neither before nor after this situation, did this configuration of actors team up to pursue similar ends. Adele Clarke states that patients do not become collective actors, unless they organize themselves. In these cases we have seen how, despite failing to organize collectively, actors nevertheless can achieve influence if they meet favorable conditions.

Bermúdez Urrego's success is also heavily dependent on the constitution of Transmilenio S.A. as a state company with full responsibility for the operation of the whole transportation system. This development in the arena of transportation was due to the desire of the designers to remove from the city the pitfalls in the distribution of legal and economic responsibilities among the actors that constituted the previous public collective transport. They were interested in constituting a powerful state company, but not particularly one that should accommodate any special requirement from special users. They were more interested in promoting an economic model of organization that would be financially sustainable for the city. They also designed parts of the system to be accessible for people with disability. They were well intentioned, but did not open the design process to participation from people with disability. Therefore it is remarkable how Bermúdez Urrego achieved influence by understanding these new conditions in the arena of transportation and accessibility to make his case.

This case adds a new element to the existing constellation of stories of implicated actors that refuse their condition in Science and Technology Studies literature. Ingunn Moser has described at least two dynamics of resistance. Interviewing Roger a motorbike enthusiast who became disabled after an accident in Norway, Moser was taken aback by Roger's invitation to wash the dishes. By treating the interviewer as a woman who should do domestic chores and not as a researcher, Roger was undoing his disability by gendering the situation in a

particular man-dominant way (Moser, 2006). Although Moser makes a different point, the interesting aspect for my argument is that Roger was resisting his role as an implicated actor in a research situation on disability. Following another victim of an accident, Moser (2009) traces the ways in which Hallvard's body is decomposed and recomposed in complex organizational arrangements in the Norwegian health system. However, the system is not aligned with Hallvard's particular needs and it is only through intense struggle that he and his family can arrange the necessary treatments for him to regain a certain degree of able-bodiedness. The interesting point is that for Hallvard's body to be recomposed he, and his family, need to attempt to recompose the health system as well. Vasilis Galis (2006) studied how organizations and individuals with disability struggled to influence the design of the Metro in Athens. His is a story of collective actions. Together with his colleague Francis Lee, he re-reads that case from the point of view of the strategies of other designers to resist their efforts (Galis & Lee, 2014). My case is similar to these three and adds to their main objective: to show how the exclusion of people with disability in our societies happens also through the design of health and transport systems. I add to these rich set of cases one in which implicated actors resisted their condition, took action as individuals and succeeded, at least provisionally, in gaining influence. The bottom line is the same, unless our societies –including their knowledges and their technologies– become more sensitive to differences, we will continue to produce discriminatory materialities like transportation systems, built environments and health care systems.

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