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Authors:	Häkli Jouni
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Boundary objects in border research: Methodological reflections with examples from two European borderlands

Jouni Häkli

Introduction

International boundaries are deceptively simple. As crisp lines on maps or concretely marked in geographical space, they communicate clear-cut division between distinct state territories, between here and there, the inside and the outside. Yet, this geometric clarity is superimposed upon multiple complexities that characterize international borderlands. While boundaries seldom separate two linguistic or cultural realms in any precise manner, it is commonplace to find international borderlands as amalgamations of two or more intermingling sets of linguistic and cultural resources, such as traditions, habits, historical narratives and customary ways of doing and understanding things. Moreover, decades and even centuries of state-based socialization through school education, political participation and the media, have resulted in borderlands evolving as the meeting points of two (or more) national societies with dissimilar institutional, legal and political systems, partly separate local economies and at times even different currencies.

On top of this socio-cultural and institutional diversity, there are different ways in which boundaries come to be enacted by people involved in dissimilar social positions, roles and settings. Hence, as is the case in the Catalan borderlands between Spain and France, for those involved in Catalan nationalist activities and organizations the boundary represents a

violation of the territorial integrity of 'Greater Catalonia' (Els Països Catalans), whereas for the practitioners of official cross-border cooperation the boundary is a meeting point and motive[2] for cooperation and, as such, a legitimate element in the border landscape (Häkli 2001).

Boundaries are an inextricable part of cross-border cooperation. However, it is fair to state that international borderlands are extremely challenging contexts for pursuing coordinated action. Several studies have shown that cross-border cooperation is a continuous struggle to bridge actors across dissimilar socio-cultural and institutional contexts, various degrees of authority and political autonomy and distinct systems or legal regulation. Hence, at stake in cross-border cooperation is a complex governance effort tackling the challenge of coordinating expertise by 'communities of practice' embedded in different socio-cultural contexts (e.g. Gualini 2003, During et al. 2007, Perkmann 2007, Leibenath et al. 2010).

To make sense of this complexity, and means that actors use to reduce it, this paper explores the potential of the concept of boundary objects in the analysis of cross-border cooperation. Empirically the paper deals with the complexities related to the different enactments of the international boundary between Spain and France in Catalonia. First the idea of boundary objects is outlined with focus on factors that maximize both communication and autonomy in interactions between communities of practice. The paper will then move on to arguing that international boundaries perform the functions of boundary objects and that this accounts for their pervasiveness even in contexts where the freedom of mobility across boundaries has been a defining feature of the development of the borderland over the past decades, such as the Catalan border landscape. The paper concludes by showing that boundary objects may be consequential for alleviating the socio-cultural complexities related to borderlands and especially to successful cross-border cooperation in Catalonia and beyond.

The idea of boundary objects

The notion of boundary objects was coined by Susan L. Star and James R. Griesemer (1989) in the context of an ethnographic

and historical study of scientific work conducted in the Museum of Vertebrate Zoology at the University of California, Berkeley in the early 20th century. That a natural history museum would[3] come to host scientific research is not self evident because these institutions were often established as exhibitions to evoke popular wonder and to provide public instruction, rather than to serve as contexts for scholarly contemplation on research problems. What Star and Griesemer (1989), therefore, found interesting is precisely why and by what means did the Museum of Vertebrate Zoology from its very inception develop as a museum devoted to scientific research. To this end they studied historical records concerning the administrators of the museum, the amateur naturalists who contributed specimens to the museum, the professional biologists conducting research in the museum, and other actors forming the network that made the scientific work possible (philanthropists, conservationists, preparators and taxidermists, and the general public). Their goal was to solve the puzzle of how the network succeeded in crafting a coherent problem-solving enterprise despite the fact that it brought together very different social worlds of amateurs, bureaucrats, professionals and scientists, and required cooperation beset by a challenging heterogeneity.

In accounting for this successful cooperation Star and Griesemer explored the different visions that stemmed from the participating social worlds and in particular paid attention to how the different 'communities of practice' could communicate and work together without consensus (Star 2010). It is here that Star and Griesemer (1989) propose the concept of boundary objects as referring to any concrete or abstract element that people can use as a point of reference in their interactions. Boundary objects work to maximize communication without requiring consensus between the interacting parties. This sets two simultaneous demands for them. First, they have to be characterized by "interpretive flexibility" so as to accommodate communication across differences. Second, in order to retain significance and attractiveness they have to be specifiable through refinements in the context of particular locations and practices so as to secure the autonomy of the cooperating parties. Boundary objects are, thus, "both ambiguous and clear, at different moments, for different purposes" (Star 2002, 118).

> Boundary objects are […] both plastic enough to adapt to local needs and the constraints of the several parties[4] employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use. These objects may be abstract or concrete. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds (Star and Griesemer 1989, 393).

In highlighting interpretive flexibility the notion points at a least common denominator recognized by the members of different social worlds. This, however, does not lead to a consensus-driven process of communication and action but rather the opposite: it provides an understanding of how cooperation may benefit from objects that can be shaped by all parties according to their needs. Hence, as "ill structured" the object (at once material and processual) resides between social worlds, but different groups can at once keep working on the object making it more specific and tailored for their own specific purposes and thus useful for work that is not interdisciplinary (Star 2010, 605). It is this tacking back and forth between flexible and rigid interpretation of an object that enables cooperation without consensus as a particular kind of problem solving enterprise.

Importantly for the purposes of this chapter, Star (2010, 605) stresses that when the oscillation between the two forms becomes standardized, then boundary objects begin to change into infrastructure, into standards, things and yet other processes. This is how cooperation across international boundaries, broadly understood, may gradually become institutionalized, turning the boundary from versatile ill-structured objects to standardized infrastructure and resource for further transnational interactions. Thus, as a consequence of intensifying cooperation the boundary will not weaken or disappear but rather it turns into a durable resource for a growing number of cooperative efforts. I elaborate this development further below.

Through an analysis of specimens, methods, field notes and maps related to the emerging research activities in Berkeley Museum of Vertebrate Zoology, Star and Griesemer[5] (1989) identify four types of boundary objects that are both concrete (material) and abstract (codified, symbolic) in their use. *The repository* is a set of indexed objects grouped in a standardized fashion, such as a museum or library. What makes repository a boundary object is the way it enables communication and action across heterogeneity by means of modularity: "People from different worlds can use or borrow from the 'pile' for their own purposes without having directly to negotiate differences in purpose" (Star and Griesemer 1989, 410). If we think of repository in the context of cross-border cooperation, common databases established for representing and analyzing cross-border phenomena – notoriously difficult to depict due to differences in nationally-based statistical systems – stands out as an apt an example. A case in point is the Interreg IIIA project ECCOMAP that aims at establishing cross-border databases between Extremadura Autonomous Region in Spain and the Alentejo Region in Portugal (ECCOMAP 2011).

Ideal type is another kind of boundary object that functions to overcome local or singular specificities through abstraction. It thus serves as an effective means of symbolic communication and cooperation because as abstractions they remain fairly vague and thus adaptable to local needs. As examples Star and Griesemer (1989, 410) give diagrams, atlases or other descriptions that do not accurately detail the location or thing they depict. In the context of cross-border cooperation ideal type could refer to any symbolic use of maps to highlight, for example, the unity of the cross-border region (e.g. Häkli 2009).

Coincident boundaries refer to objects that are identical in regard to their contours but have different internal contents. As an example of coincident boundaries Star and Griesemer (1989, 411) give the territorial shape of the state of California, which enabled the amateur naturalists, the administrators and the scientists to conduct their work autonomously with a firm understanding that all this work, carried out by different participating communities of practice, actually deals with the same object, California. In cross-border cooperation coincident

boundaries are recurrently resorted to in multiple ways, both abstractly and concretely. For example, when land use in a cross-border region is planned as a joint effort, it may be[6] necessary to carry out two separate zoning processes due to different jurisdictions that regulate the processes in different sides of the international boundary. Here cartographic alignment of the zoning areas enables the two processes to be carried out autonomously but synchronizing the outcome by means of a joint boundary linking the two planning areas (Häkli 2009).

Standardized forms are the fourth type of boundary objects Star and Griesemer (1989) identify in their study. The term refers to methods for reducing the uncertainties pertaining to work carried out in dispersed locations and heterogeneous groups. If we extend the idea of standardized forms to include the regulatory setting under which cross-border cooperation is undertaken, the European cooperation instrument European Grouping for Territorial Cooperation (EGTC) provides an illuminating example. EGTC is a treaty based legal instrument established in 2007 at European Community level to overcome the obstacles hindering territorial cooperation. The instrument enables the creation of cooperative groupings formed by states, regional or local authorities, associations or any other public bodies in Community territory. Importantly, the EGTC grouping has legal personality. This simplifies the management procedures of cross-border cooperation as these no longer need to be established separately for all cooperating legal entities. However the EGTC can be the sole body responsible for project management (INTERACT 2011). The standardization of cross-border governance by means of EGTCs is of importance to all forms of cooperation that have suffered from complexities related to having to operate under different national legislative frameworks. Interestingly, the Euroregion Pyrenees-Mediterranean was officially established as one of the first EGTCs in August 2009 (Euroregion 2011).

In presenting the idea of boundary objects at work in the Berkeley Museum of Vertebrate Zoology, Star and Griesemer (1989, 410) are clear to point out that the four types and the empirical examples they give are not an exhaustive list in this case, let alone more broadly. They propose the types as reflective of analytical distinctions within a system of boundary

objects, not as ideal types that can be found in all contexts. Indeed, some characteristics of the types of boundary objects seem to overlap and a single object could be seen to embody[7] two or more of these types (as in the case of ideal type and coincident boundaries, which both could apply to territorial representations of space as boundary objects).

Given the 'interpretive flexibility' of the concept itself, it is not surprising that there are numerous different uses that the concept has been put in scholarship following Star and Griesemer's seminal work. The notion has found foothold especially in areas of research focusing on expert systems and collaborative scientific work (e.g. Aibar and Bijker 1997, Henderson 1998, MacEachern 2001, Jensen 2005, Prasad 2007, Schneider 2009). While criticisms have been levelled against simplistic or anecdotal uses of boundary objects, as referring to any artefact involved in coordinated actions, there is a sizeable literature portraying nuanced analyses of collaborative processes and taking seriously the complexity of the interactions between social worlds (Trompette and Vinck 2009).

Somewhat concerned about the at times overly flexible uses of the notion, also Susan Leigh Star (2010) has in retrospect proposed some limits to the analytical application of boundary objects concept. While refraining from normative statements about the true meaning and use of the concept, she nevertheless suggests that boundary objects are analytically most useful when applied in proper scale and scope. Regarding the former, the notion is best at home when it is used to analyze processes occurring at organizational level. Hence, whatever the context it is employed in, it is the organization of collaborative action and the intersection of participating worlds at stake in the process that can be better understood through the lens of boundary objects (Star 2010, 612).

When it comes to the proper scope of the notion, Star (2010) suggests that it is best seen as specific to collaborative efforts rather than applicable to any artefact that portrays interpretive flexibility (such as a flag, the Bible or a particular film). However, Star (2010) is careful to stress that, for example, an American flag might well play a role in a collaborative effort to advertise, market and distribute flags. But again, the proper

scope of the notion restricts its use to organizational level and the role that artefacts play in this domain (Star 2010, 613).

Mindful of these conceptual limits, I propose that the[8] notion of boundary objects may offer interesting perspectives and novel approaches to the study of multifarious cross-border cooperation processes. First and foremost I think that the notion is valuable as a methodological orientation that helps pay attention to practices instead of focusing on structural and institutional conditions alone. Moreover, the approach brings to the fore the role of material objects and artefacts that may be consequential for cross-border cooperation, including the materiality of the international boundary. This may be helpful in bringing into balance the constructionist and materialist readings of boundaries as elements of everyday political and cultural landscapes. Thus, seen in terms of boundary objects, the international boundary is multiple. It is both abstract and concrete, general and specific, conventional and unforeseen, process and a protocol. It has different meanings in different worlds, but those meanings are sufficiently structured to be mutually recognized. As a methodological guideline, boundary objects approach points at the question of how actors involved in cross-border cooperation maintain their differences and their cooperation, how they manage and restrict variety, and how they coordinate in space and time. It is a conceptual tool highly attentive to particular contexts and thus well tuned for empirical work focusing on different kinds of borderland contexts. It makes visible the ways in which actors operating in socially and spatially contingent circumstances come to establish and maintain coherence between intersecting social worlds, without an overarching consensus as the condition of their collaborative work.

Boundary objects in cross-border cooperation

The notion of boundary objects has been used in a wide variety of research areas including research on collaborative systems, organizational change and social studies of science and technology. Perhaps surprisingly the notion has found only few applications in border studies, despite the fact that the concept of

boundary object would appear to resonate fairly well with the conceptual repertoire of this multidisciplinary research area. The few works that use the concept of border objects mainly[9] employ the notion as a heuristic device that might explain the success (or failure) of collaborative work across international boundaries (e.g. Grygar 2009, Leibenath et al. 2010, Wilder et al. 2010). While in these works the idea of boundary objects is used in its proper scale and scope, they are not in-depth analyses designed from the outset to apply the methodology of boundary objects approach.

In view of this apparent research lacuna I wish to probe further with the idea of boundary objects as one potent methodological guideline in the analysis of cross-border cooperation. I do not propose that this approach is once-and-for-all solution to all analytical challenges involved in understanding and explaining cross-border phenomena, but rather wish to outline relatively strict limits to where the best potential of boundary objects might lie in this research field. To argue for the added value of this approach I propose some research questions, or 'puzzles', where its potential may have analytical purchase in the scrutiny of cross-border cooperation. While the discussion will use examples from the cross-border cooperation at the Catalan borderlands between Spain and France, I will also resort to my previous experience with a research project on Swedish-Finnish cross-border cooperation, where I first sought to develop the idea of boundary objects as a factor in transnational collaboration.

To begin to narrow down the scale and scope of the areas of application for the boundary objects notion, it is useful to take heed of Susan Leigh Star's (2010) suggestion that the concept works best when applied in the kinds of research settings it was initially designed for. To this end, the analytical focus of boundary objects analysis should lie in a relatively coherent collaborative effort where the *key actors can be known* and even named. In the case of cross-border cooperation this is not uncommon and thus the limitation will not restrict the viable use of the approach too much. Importantly, there is more at stake here than just locating the key actors as a matter of fact. Because the boundary objects approach is well suited for ethnographic analysis, the very procedure through which the key actors is

traced may be a significant part of the emerging understanding of what the collaborative network is like, where its 'system boundaries' lie, how these boundaries are produced and what[10] the role of amateurs and lay people is in the unfolding cooperation. In other words, the methodological rule of focusing on key actors does not rule out major interest in the participation, or non-participation, of the ordinary borderlanders in the cross-border cooperation. In fact, paying attention to the 'system boundaries' through which the key actors coordinate and control their collaboration may be highly consequential for the understanding of why certain collaboration is successful or fails to be that.

Targeting specifically the organizational level of social action brings us to the second limitation proposed by Star (2010): To remain in its proper scope the boundary objects analysis should focus on *a joint effort to accomplish something*, rather than analyze any intersection of heterogeneous social worlds that might have a relation to cross-border cooperation. Again, this is typical to cross-border cooperation and thus the condition will not preclude the approach from being a useful analytical tool in the research field.

Together the two methodological rules appear to lay the approach at the very centre of research on cross-border cooperation. After all, these processes tend to be purposeful efforts to accomplish clearly articulated goals through a collaboration of certain players representing organizations, institutions and communities from both sides of international boundaries. For example, in the context of Catalan borderlands there are numerous ongoing collaborative efforts to foster local and regional development (e.g. Four Motors for Europe - network), develop public service provision (e.g. the Cerdanya cross-border hospital), institutionalize incipient forms of governance (e.g. Euroregion Pyrenees-Mediterranean), to name just a few (Generalitat 2011). In any of these cases it would be possible to determine who the most important actors in charge of the cooperation are, what their shared and specific goals are, which areas of professional expertise they represent and how their worlds intersect in the collaborative processes.

Yet, there certainly are questions that the methodology works to solve better than others. To trace these it is good to

recall the ethnographic origins of the boundary objects approach as developed by Star and Griesemer (1989). Star (2010) mentions several previous research endeavours that contributed[11] to the idea of boundary objects in the analysis of scientific work in the Berkeley Museum of Vertebrate Zoology. What these all have in common is the goal of looking at scientific practice as it unfolds 'on the ground' – in laboratories and through scientists' interactions. At stake here is less a specific, narrowly defined approach to on-site field work or the collection of empirical data by means of participant observation. Rather the defining element in boundary objects methodology is that it encourages the researcher to ask unconventional questions and seek answers from events and phenomena that might be disregarded as irrelevant for the processes under scrutiny. In other words, the approach at its best is a way of 'anthropologizing' cross-border cooperation by directing attention also to actions, elements and objects that the actors themselves can not account for as important but which they nevertheless use routinely to carry out their work.

While on-site observation of collaborative practices may be a relevant research strategy, it is important to remain open-minded when it comes to choosing of empirical materials for in-depth analysis. Star and Griesemer (1989) themselves mainly resort to historical records and collections of specimens from which they trace aspects that they interpret as performing the function of boundary objects. In a similar vein I analyzed the development of cross-border cooperation since the late 1990s in the twin towns of Haparanda and Tornio at the boundary between Sweden and Finland (Häkli 2009). Methodologically I based my analysis on various documents related to the planning and realization of the *På Gränsen – Rajalla* cross-border cooperation project. The project (literally meaning "on the border") is a still ongoing effort at coordinated community planning between Haparanda and Tornio with the aim of physically uniting the two towns by constructing a common town centre.

My aim was to look at how different 'communities of practice' have pursued cross-border cooperation bridging the social worlds created through distinct areas of professional expertise and national discourses and practices. From documents

and publications related to the *På Gränsen – Rajalla* project I traced the ways in which the Tornio River, a 'natural boundary' between Sweden and Finland, was crafted as a[12] boundary object in cooperative networks. While the materials I analyzed did carry certain limitations, including their emphasis on the visual and verbal at the cost of direct observation, they nevertheless enabled me to approach in an unconventional vein the means that have been utilized to facilitate communication and cooperation across intersecting social worlds at this international borderland.

This effort resulted in a close re-reading of the project documentation especially in view of how the Tornio River was adopted as a three-fold boundary object. First, the Tornio River was significant as a physical entity vested with a degree of agency in relation to the project. Second, the representation of the Tornio River was important as a means of overcoming the dividing function of the border especially from the point of view of physical planning. Third, the river acquired a role as a symbolic space in the border landscape, thus helping to extend the sphere of the project from the core actors toward the broader citizenry. The national boundary performed as the river's affective kernel and locus of passion – as spatial symbolism that helped unite differing experiences between professional worlds and the borderlanders' lived situations (Häkli 2009).

A similar anthropological approach might open up new understandings of what makes cross-border cooperation successful in Catalonia. Some factors in this regard are already well established, such as the fact that both Spain and France have a Catalan speaking minority living at the Catalan borderland, even though the political and economic position of the Spanish Catalonia, *el Principat*, clearly exceeds that of its northern counterpart (Mansvelt-Beck 1993, Mancebo 1999). There also exists a strong cultural affinity across the Franco-Spanish boundary supporting cross-border cooperation. Adding to this, both Spain and France are Schengen countries, which makes the cross-border mobility of goods and people smooth and easy. Given the fact that Catalonia is one of the more active European regions with a marked interest in forging relations of co-operation with partners in other European countries, it is hardly surprising that examples of successful projects are many,

ranging from sister cities' exchange of experience and
information to local cross-border co-operation in areas such as
the annual vehicle inspection, water treatment and the[13]
development of tourism (Guibernau 1997, Roig 1997). Larger
scale projects range from the mountain regions' cooperation
under the Working Community of the Pyrenees (*La Comunitat
de Treball dels Pirineus*) to a programme for establishing the
Catalan Cross-Border Eurodistrict (*Eurodistricte de l'Espai
Català Transfronterer*) as a legal entity to support cooperation
aimed social, cultural and political development of the Catalan
borderland (Generalitat 2011).

Yet, as is the case with most collaborative work involving
experts with different backgrounds and areas of specialization,
Catalan cross-border cooperation is not without challenges.
Adding to this heterogeneity is the nature of cross-border
cooperation as professional activity not confined in laboratories,
museums or the pages of professional journals. On the contrary,
the collaboration and its results are to a great extent a public
matter involving the views, opinions and sometimes even
participation by the broader citizenry. As has been shown in
several studies of cross-border cooperation, these broader
ramifications are far from simple or predictable when it comes
to acquiring acceptance and legitimacy for this collaborative
work and its goals (Häkli 2001, 2002, Strüver 2004). Hence, in
Catalonia the contemporary social and economic conditions
under which various forms of cross-border co-operation take
place include different perspectives on the border and its
meanings. Those who are institutionally involved in official
cross-border co-operation tend to view the borderland
differently from those who are committed to, say, nationalist
goals. The rather extreme views of the latter, again, may differ
considerably from those of the borderland denizens, for whom
the borderland merely represents an everyday environment
marked by certain physical and social characteristics (Häkli
2001).

It is for assessing the terms under which cross-border
cooperation succeeds both as a professional effort and in gaining
political legitimacy through popular acceptance that the
boundary objects methodology might prove useful. As I have
argued above, successful cross-border cooperation is similar to

scientific work in that it may utilize boundary objects to help in negotiating and resolving potentially conflicting sets of concerns that arise from the intersection of the multiple[14] communities of practice involved. To this end they function as intermediaries between social worlds that should be able to communicate, cooperate and stay committed within this heterogeneous social landscape.

Enacting the Franco-Spanish boundary as boundary objects

As shown in the discussion above, boundary objects can be of many different kinds. However, in the case of Catalan borderlands there is one particular aspect to the Franco-Spanish border that stands out as providing an interesting example of the potential of this methodology. As is well known, the border is demarcated along the highest elevation of the Pyrenees, a monumental physical divider between Spain and France. Yet, instead of merely separating people the mountains also represent a cultural link between the Spanish and French Catalonias, a cross-border region inhabited by 'mountain people' (Häkli 2004). By means of the boundary objects approach it is possible to grasp the intertwinement of social and material realities, instead of working merely within the constructionist realm of cultural signification. The latter emphasis points at one of the intellectual homes of the boundary objects approach: the Actor Network Theory (ANT).

Besides deriving from ethnographic research orientation within science and technology studies, the boundary objects methodology was developed in the intellectual context of ANT. From the outset the proponents of ANT have considered human and non-human actors and social and material elements as potentially equally relevant to the understanding and explanation of social phenomena. In setting forth the concept of boundary objects Star and Greisemer (1989) wanted to develop further the ANT model of 'translations' as developed by Bruno Latour, Michel Callon and John Law. They saw that ANT has overemphasized the perspective of an aspiring scientist or other entrepreneur who attempts to enrol allies by re-interpreting their concerns to fit their own programmatic goals. Instead of such mono-perspectival accounts of translation, Star and Griesemer

proposed that it is necessary to analyze the multiple negotiations that are needed for cooperation occurring at the intersection of different participating social worlds (Star and Griesemer 1989:[15] 396).

To accept that material artefacts and elements are potentially important as boundary objects it is not necessary to digest all claims of ANT, such as the symmetry between a human and non-human agency. Indeed, many scholars interested in the approach may find it more feasible to work with a "weak version" of ANT that views the networks of actors as both social (human) and material (non-human), but not in equal measures because it is social relations that direct the shaping of the networks (Murdoch 1998, Castree 2002). This is my own understanding as well. Human actors are "interactive" while non-human actors are "indifferent", i.e. unlike the latter, human actors are conscious about their position in the structure and environment around them (Hacking 1999).

This said, viewing the Pyrenees mountain range as a boundary object may be illuminating of both how the material landscape supports cooperation and how this cooperation, broadly understood, consolidates the international boundary as its standardized "infrastructure" (cf. Star 2010). To trace the different guises in which the Pyrenees may function as boundary objects, it is useful to examine the different ways in which the international boundary is enacted by those involved in cross-border cooperation. It is likely that the Franco-Spanish boundary of the Pyrenees figures simultaneously as a cultural, material and representational reality. As an environment challenged by scarce means of communication as well as other aspects of limited accessibility, the mountains are already part of multilateral negotiation for instance within the perimeter of the Working Community of the Pyrenees that focuses on development issues specific to mountain municipalities. Within this cooperation the mountains are a tangible reality that professionals from different domains can approach as something they consider essentially the same, but nevertheless, are able to specify in ways that reflect their particular framings (e.g. environmental concerns, communications and logistics, boundary effect on regional development, changing demographics, evolving governance).

Cooperation across various areas of expertise is challenging in itself but the role of the Pyrenees as boundary objects extends well beyond professional interactions. Rather[16] than being just a physical matter of fact, the mountains represent various aspects that are essential to Catalan history and identity. On the most fundamental level the Pyrenees are connected to struggles against domination by the Moorish political power in the Early Middle Ages (Nogué 1998). Later on, resistance toward Castilian centralization policies centred at times on the monasteries of Ripoll and Montserrat, both sheltered by an extraordinary mountain landscape that has become a quintessential symbol of Catalan national identity. Moreover, Catalan poets and writers have depicted the mountains as a sacred and intact virgin nature reflecting the national character of the Catalan people (Nogué 1998). In the early nineteenth century Catalan intelligentsia were drawn to mountain exploration motivated by nationalist as much as scientific and artistic curiosity. Hiking at the Pyrenees was associated with discovering the Catalan national character and landscape, and by the early twentieth century a hiking association, the *Centre Excursionista de Catalunya*, had become one of the most influential societies of civic and cultural character (García-Ramon and Nogué-Font 1994).

In all, the symbolic value of Pyrenees for Catalan identity is considerable. This puts into sharp relief the Treaty of the Pyrenees 1659 that resulted in the annexation of the northern part of Catalonia to France (García-Ramon and Nogué-Font 1994). Even though it took two centuries before the boundary actually materialized in the mountain landscape, the Pyrenees had irrevocably turned into a landscape that, at once, represented the Catalans' mountain way of life and constituted a natural divider between the southern and northern parts of the Catalan lands.

It is this contested but well established history that may provide for the interpretive flexibility engaging the broader citizenry in the border landscape in which cross-border cooperation is embedded in Catalonia. It is clear that for the professional networks of cooperation the Pyrenees often figures as a cultural link or a bridge composed of various means and forms of interaction. However, in the light of existing

scholarship it is less evident that the professionally-driven cross-border cooperation can evolve into a platform for broadly shared political and cultural identity across the Franco-Spanish[17] border. This, in fact, is not yet commonly found at European borderlands. Instead of a passionate will to exploit the possibilities of the increasingly open EU internal boundaries, many ordinary borderlanders remain indifferent toward the market opportunities "on the other side" (van der Velde and van Houtum 2004). Moreover, there typically exists a gap between institutional cross-border activities and the borderlanders' interests toward and knowledge about these activities (e.g. Häkli 2001, Kramsch 2002, Sidaway 2004, Strüver 2004). The discrepancy between official and popular views may have the consequence of diminishing the value of cross-border cooperation. Thus, whatever the achievements of cooperation at the official level are, these may remain without deeper rooting in the borderlanders' social and political fabric.

For the latter to happen in Catalonia the Pyrenees should emerge as a boundary object inhabiting several communities of practice and satisfying the informational requirements of each of them, that is, a reality that, in the face of missing consensus among the broader citizenry nevertheless provides a common enough rationale to more than one social world to make the collaborative work recognizable. In such a case the Pyrenean cross-border cooperation would gain acceptance and legitimacy among the borderlanders, either consciously or subliminally, bridging the gap between professional and lay concerns.

But even then, the status quo is temporary and remains so until the boundary objects are gradually standardized and turn into boundary infrastructures (Star 2010). The latter term refers to the realities that are naturalized to the point where their stability holds for more than one world simultaneously and, thus, is not commonly called into question. As Bowker and Star (1999: 299) aptly point out, "naturalization means stripping away the contingencies of an object's creation and its situated nature. A naturalized object has lost its anthropological strangeness". They stress that when an object becomes naturalized in more than one community of practice, it turns into an infrastructure that acts as a resource for social action by allowing for local variation but with sufficiently consistent

structure to serve standard procedures to be carried out with systematic tools (forms, statistics, and so forth) (Bowker and Star 1999: 313-314). 18

If the Pyrenees function as a boundary object bridging the worlds of various professionals and experts and extending all the way to the multiple everyday worlds of Catalan borderlanders, the international boundary in all its institutional stability, judicial clarity, and material objectivity is best understood as a naturalized object in the sense proposed by Bowker and Star (1999). Cross-border cooperation is by necessity characterized by openness to dissenting views and dissimilar ways of framing the manifold goals, forms and objectives of this collaborative work. Boundary objects may be helpful in alleviating this lack of consensus. However, the Franco-Spanish boundary itself is an institution beyond questioning. The boundary is permanent even though not eternal or immutable. Even those Catalan nationalists who would wish to eradicate the boundary come to attest to its existence in their intentions and actions. In this regard the institution of the Franco-Spanish boundary is a 'boundary infrastructure' serving the rise and fall of more temporary boundary objects that make cross-border cooperation possible. Hence, contrary to some expectations the boundary is not challenged by cross-border cooperation but rather it is deeply embedded in this collaborative work. This at least partly accounts for the resilience of international boundaries in the age of cross-border regionalization, cooperation and mobility.

Conclusion

In this chapter I have proposed that the notion of boundary objects and the concomitant methodology can be helpful in assessing in some novel ways the possible successes and failures of cross-border cooperation. By necessity the discussion here is tentative at best, and much more work is needed to develop the methodology in the context of border studies. However, I hope to have accomplished some conclusions regarding this emergent approach.

First, in view of its proper scale and scope, the notion of boundary objects appears well suited for the analysis of cross-border cooperation and related phenomena. Collaboration[19] across international boundaries is a matter that can feasibly be studied on an organizational level, and as an intentional activity that involves heterogeneous areas of expertise and dissimilar groups of actors inhabiting different social worlds. To this much studied field boundary objects methodology helps import 'anthropological' approaches that pay attention to the mundane practices of professional actors and lay people. Moreover as a descendant of actor network theory, the boundary objects methodology is sensitive to the role of material environments and artefacts in how social processes unfold. Both research approaches are relatively scarce in the border studies literature.

Second, the notion of boundary objects, coupled with that of infrastructures, may be helpful in making sense of why the vast growth of cross-border activities has so little undermined the institution of international boundaries. By introducing a conceptual vocabulary attuned to emergence and stability existing in tandem, the boundary objects methodology foregrounds aspects in the political, cultural and economic development that have hitherto been obscured by the very conventional language used in describing these major developments in Europe and elsewhere.

Third, while there certainly are several threads in the boundary objects methodology that apply generally, it is also clear that in all borderland contexts are to some extent unique and thus demanding specific adjustments to the approach to make it feasible and adequate for the assessment of the phenomena at hand. In this regard the boundary objects methodology is a useful guideline for designing novel approaches to cross-border phenomena, rather than a toolbox readily applicable to making sense of cross-border cooperation.

In all, the notion of boundary objects deserves more careful examination and also critical interrogation before its full potential in border studies can be assessed. On the basis on this tentative discussion, the potential is certainly there. The challenges that this theoretically inspiring and empirically productive work presents, I trust, will intrigue scholars interested in culturally and politically oriented border studies.

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