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ANALYSING URBAN POLICY DISCOURSES USING TEXTOMETRY
AN APPLICATION TO FRENCH URBAN TRANSPORT PLANS (2000–2015)

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Abstract

This paper supplements the array of methods in urban policy discourse analysis by applying textometry to a corpus of planning documents. Textometry is a systematic computer-assisted analysis of textual data. When applied to large corpora, the method can reveal contrasts that cannot readily be detected by non-instrumented human reading (Comby, 2015). It seems promising therefore to use textometry to analyse urban planning documents which, in France as in other countries, are reputed for being at first sight much of a muchness and rather lengthy (Offner, 2006). By analysing dozens of documents at a time, this method ramps up the scale of analysis enabling us to identify massive transitions in discourse over time or major contrasts among discourses emanating from specific groups of actors. When combined with classical methods (i.e. interviews, qualitative archival research) textometry seems to be effective at identifying new ways of understanding urban policy discourses.

To exemplify the potential of such a method, the analysis developed here draws on a corpus of 36 French urban transport plans (plans de déplacements urbains) for the period 2000–2015. Our results display marked contrasts in discourses, mainly as a result of changes over time. Paradoxically, for most cities between 2000 and 2010 the discourses become increasingly abstract in their content while highlighting a proactive attitude and providing specific information on the document implementation process and a precise list of institutional partners.

Keywords: Discourse, urban planning, textometry, transport planning, Urban Transport Plans

Introduction

Despite the increased use of discourse analysis in the literature on urban policy research, two major shortcomings seem to cast doubt on the scientific character of the methodologies developed (Jacobs, 2006). Much criticism is levelled at the elusive and unsystematic character of these approaches. More precisely the observed tendency to "overgeneralize and infer too much from a particular example" (Jacobs, 2006: 47) is problematic. A second shortcoming is that most of these approaches tend to overfocus on the language of texts at the expense of social practices. In order to make urban policy discourse analysis more systematic and methodologically explicit we propose here to explore the potential contributions from textometry, which is a particular form of statistical analysis of textual data. This proposal has to be considered in conjunction with other methods to strengthen the scientific basis of traditional qualitative studies and enhance their capacity to deal with larger data sets.

To exemplify the potential of such a method, the analysis developed here draws on a corpus of 36 French urban transport plans (plans de déplacements urbains) for the period 2000–2015. These plans are mandatory documents in France for cities of more than 100,000 inhabitants and have to be revised every 10 years. The corpus we have analysed encompasses 18 initial and revised versions of such plans. Taking PDUs as source material in this way authorises a potential change in the scale of analysis and provides the opportunity to develop diachronic studies. That being said, these potential changes are dependent on the removal of certain methodological obstacles.

1.   Selecting data and methods for analysing urban policy discourses

1.1. "Classical" sources and investigative techniques that show their limitations

Many disciplines endeavour to understand the deep-rooted reasons underlying urban policies through qualitative or quantitative surveys based on data produced and collected in the context of research. These "classical" sources and investigative techniques such as questionnaires, experiments or interviews with actors have shown their limits in terms of distanced and systematised analysis of urban policy.

Interviews with actors are the principal method used to access the beliefs and perceptions to which different actors adhere. Yet, this technique has four well-known limitations. The first is the very marked resort to a certain form of cant by some respondents, most notably elected officials. Accordingly, it is sometimes very difficult to grasp the full complexity of the "underlying rationales" for implementing a particular project or policy. A second limitation is the phenomenon of *ex-post* rationalisation, that is, an explanation given for past reasons drawing on elements from the present (Bourdieu, 2000). This distortion of the reasons for the initial action is all the more obvious when actors involved in a project or policy are questioned some decades later as witnesses of a period. Third, researcher biases may arise due to errors and oversights be they intentional or unintentional during

interviews with actors (in the same way as with questionnaires or experiments). Lastly, interviews with actors are very time-consuming and thus this method is often reserved for limited data sets.

Some of these problems could be offset *a priori* by having the same respondents complete the questionnaires. That said, it seems that elected officials are (generally) unwilling to respond to them despite assurances as to anonymity. Technicians and their views of the policies implemented are therefore overrepresented within the public sphere.

Lastly it is possible to conduct experiments (Tannier et al., 2016) by placing urban policy actors in virtual situations in order to ascertain their opinions, strategies or representations as to the territory with which they are involved. In the world of city planning, such experiments are still rather rare. Their main shortcoming is that they tend to generalise their results, since the experiments simulate a context and a time span for decision making. A further issue is that "induced data" sources of this kind do not allow diachronic analysis.

Archival research does allow diachronic analysis but it has rarely been exploited over long periods in urban policy research. This is probably due to the time required for such research, and for organising and analysing the often very voluminous information on a particular subject. These limitations mean that most such research focuses on a particular case study and its results can rarely be generalised (MacCalum & Hopkins, 2011). In urban policy research, the comparative perspective appears to be first-rate work with high potential. It is, however, conditioned by the development of robust methodologies for analysing large data sets and compatible with the time constraints of research.

1.2. Challenges and limitations of urban policy "discourse analysis"

Since the late 1990s (Hastings, 1999), numerous research projects in the field of development have claimed to deploy "discourse analysis". The term encompasses very different practices. They fall into two categories (Maingueneau, 2012):

- "discourse *studies*" which share the common understanding that "discourse" is the simple result of a language practice (conversations, interviews) produced in a particular social and political context. Discourse is considered to be an instrument providing clues that enable researchers to access "realities" lying outside language. These "discourse studies", which are in the majority, tend to approach a form of content analysis in the way that they pay little attention to language itself. They often consider language to be transparent and make a distinction between social and linguistic issues. In doing so, these "discourse studies" tend to overlook what it is that differentiates the simple output of a communicative interaction from "discourse".

- "discourse *analysis*" is one of the interpretative disciplines of "discourse studies". It specifically considers discourse as the articulation of texts and social practices. Discourse, from this perspective, corresponds neither to the text nor to the situation of communication, but to what links them together through a certain enunciation device (Fairclough, 2003).

The development of research about discourse in urban policies has sometimes been slowed due to numerous critiques finely expounded by Keith Jacobs (2006). Two of the criticisms that Jacobs rightly pinpoints seems to be closely correlated in that they involve the scientific rigour of "discourse studies".

Indeed, a first pitfall would seem to be a lack of explanation about the methodologies used and their theoretical assumptions. A second pitfall concerns the traceability of the interpretative path followed by researchers, who allegedly tend to over-generalise the inferences linked to the exploitation of a particular excerpt, the very choice of which may be open to debate. To what extent does the researcher's starting hypothesis not contribute to focusing his attention on one excerpt rather than another? The criticism concerns the risk of circularity associated with a hypothetical-deductive approach.

Faced with these two first limitations, we propose here a method that could potentially enhance urban policy discourse analysis: the use of textometry applied to urban planning documents. At the crossroads of language sciences, statistics and computing, textometry is not a "new" method since it is based on lexicometry's heritage (Lebart and Salem, 1994) which arose in France in the 1970s. Textometry relies on a quantitative data analysis, which mediates the researcher's relationship with the text: it allows extensive and precise counts of the vocabulary used in a large collection of textual data, the consultation of which suspends interpretative activity pending observation and description phases. Beyond that, textometry allows a wide range of sophisticated statistical computations aiming at exploring semantics (co-occurrence networks, contextual attraction of terms) or at comparing and contrasting the characteristics of several texts (over- and under-use of terms in the various divisions of the corpus, factorial analyses). Textometry is efficient at identifying similarities and variations between texts or groups of texts, while maintaining a contrasting approach (Comby, 2015). When applied to voluminous corpora, this method can reveal contrasts in discourses that could not readily be detected by non-instrumented human reading or predicted on the basis of common knowledge. Significantly, textometry differs from other statistical approaches to textual data in that it attaches importance to the text as an empirical and theoretical object. In that respect, textometry tools, such as the open and free-of-charge TXM tool[1] (Heiden, 2010) are distinguished by functionalities (concordancer) and an ergonomic design that allows users, with just a click, to return to the text in order to observe the actual occurrences in context, and thereafter to construct qualitative interpretations. Within the limits of this paper, we shall focus on the heuristic value of textometry and its capacity to support an inductive approach to a large amount of textual data.

1.3. Urban planning documents as institutional discourse

In combination with a corpus of planning documents, textometry enables a change of scale (wider scale of data, diachronic perspective) compared with traditional investigative techniques. Textometry also provides a methodology that serves a discourse analysis perspective in an appropriate way. What we understand by "discourse" is a specific enunciative device that has to be described and interpreted from several standpoints of entanglement between a text and social practices (i.e. several urban and political contexts).

As explained by Fairclough (2003), no text can be produced without a social practice and each social practice is distinguished by its own authorised language forms (type of texts, language registers,

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[1] http://textometrie.ens-lyon.fr/?lang=en is the address for downloading TXM software

etc.). In the French tradition of discourse analysis, the notion of a "discourse type" is a decisive conceptual tool for thinking about this link between a verbal production of a particular practice and its particular communication devices (*dispositif de communication*). From that perspective, urban planning documents have to be considered as utterances of *institutional discourse* (as against political discourse, media discourse, etc.). This term refers to a discourse with a strong active and performative dimension produced by an institution, emanating from a collective entity presented as indivisible while being the product of a negotiation between various points of view. Therefore, institutional discourse is guided by a dual principle of stabilisation of statements and erasure of conflict (Krieg-Planque and Oger, 2013). The state-of-the-art highlights that institutional discourse is characterised by linguistic regularities: a marked appetite for stereotypical writings (not to say "clichés"), phraseological elements and performative utterances (Krieg-Planque, 2012).

Hence, it is not surprising that, as with most operational spheres or in research on urban public action, Offner (2006: 15) should describe urban planning documents in general and PDUs in particular as "wishy-washy", "polished" and "non-conflictual". The apparent "uniformity" of these planning documents is specific to institutional discourse. From a methodological point of view, the questions arising around the standardisation of their contents correspond particularly well to the opportunities textometry offers. Statistics, the science of gaps *par excellence*, makes it possible to attract researchers' attention to both the common trends of the planning documents and the (more or less discrete) variations in these documents that have been the subject of processes of "smoothing" (Oger and Ollivier-Yaniv, 2010) and are known to be prolix and at first sight somewhat similar in terms of content.

2. Data and method

2.1. PDU: content and governance

The method we discuss here focuses exclusively on the plan itself as research material. This excludes *de facto* newspaper articles, reports of proceedings, public statements and press releases that go along with the whole implementation process of the plan. In that respect, it seems necessary to present a brief description of a PDU, its content and the governance structures affecting the implementation of these documents.

In a nutshell, PDUs are mandatory documents in France for cities of more than 100,000 inhabitants. They are equivalent to other urban transport plans in Europe, as they concern planning transport for people and goods on the scale of the conurbation. They deal with the infrastructures and services to be put in place, changes in transport modes, urban logistics and access for the disabled. The organisation implementing the PDU may be either the public transport authority or the local authority. This project owner is often associated with a consulting office specialised in urban or transport planning. Apart from these two main structures, other actors are involved during the PDU consultation process: different authorities (*Régions*, *Départements*, neighbouring local authorities), chambers of commerce or public transport users' associations. The whole process generally lasts three to four years and finishes with the final approval (or disapproval) of the Prefect, i.e. the local

representative of central government. This final procedure is to check that the PDU complies with the legislation in force. A revision of the document is required every 10 years at least.

For a better understanding of the current governance structure surrounding PDUs, it seems necessary to clarify its origins. In France, the idea of transport planning on the scale of the conurbation emerged with the 1982 LOTI Act, in a broader context of government decentralisation. This first wave of incentives suggested the implementation of a PDU for all interested cities, without any real statutory constraint. Only a few local authorities followed this movement. None successfully completed the implementation process. Indeed, successive political changeovers in central government in the 1980s made this document progressively obsolete.

The vast majority of French cities devised and put in place their first PDU in the early 2000s. Most of these early plans correspond to the 1996 LAURE Act and more specifically to the requirement to produce a PDU "within three years", bolstered by the requirement (in the 2000 SRU Act) for cities to produce a PDU in order to secure financial support from central government for their "dedicated public transport lane" projects. This legal obligation appeared in order to speed up the implementation of the plans. Several local authorities failed to meet the original deadlines and proved reluctant to implement their first PDU. Several local actors saw PDUs as yet one more document in the long series of requirements imposed by central government (Offner, 2006).

As a result of this evolving legal context, two main waves of approvals of mandatory PDUs emerged. The first came in the years 2000 to 2005, followed by second wave of revised documents in the years between 2010 and 2015 in line with the statutory limit of 10 years for the revised version. The corpus we have analysed follows these two main waves.

Since the general reorganisation of the French national planning system through the 2000 SRU Act, the PDU has played an important role. Local urban planning schemes (PLU – *Plan local d'urbanisme*), defining land-use at the municipality level, have to be consistent with their respective PDU. And the PDU in turn has to be compatible with broader supra-local orientation documents.

That being said, in terms of content, the PDU cannot be considered as a strong commitment: no legal consequences ensue if the objectives are not attained. In order to enhance the responsibility of the local authorities towards their own prior commitments, the 2010 *ENE* Act added the requirement of an environmental evaluation of the previous PDU for every revised plan.

2.2. Representative character of the sample

The objective of analysing PDU discourses on a larger scale (wider scale of data, diachronic perspective) with textometry requires a representative sample of the "parent population" of all cities obligated to put in place and revise a transport plan in the period 2000–2015. The 36 urban transport plans consist of two issues for 18 French cities (Table 1).

As a quick analysis of the metadata, the sample is representative whether we consider the population present within the "urban transport perimeter", the type of organisation producing the document or the colour of the political majority when approving the two issues of the transport plan. The 18 cities analysed provide a good representation of the diversity of cases to be found for all 66 French areas concerned by urban transport plans. Of course, some minor deviations are observed with

in particular a slight over-representation of cases where public transport authorities are the project owners of the document (33% versus 21% for all cities). In terms of city size, the sample of transport plans contains slightly more "extreme" cases (very large and very small cities). The class of cities with 100,000 – 250,000 inhabitants is therefore slightly under-represented (44% as against 55%). Despite these slight deviations, we can assert that by these criteria, the sample proposed is representative of the diversity of cases found nationwide.

Variables	Categories	Conurbations in the corpus (N= 18)		All conurbations in France required to produce and update an urban transport plan (N = 66)	
		N =	Frequency	N =	Frequency
Population within the urban transport perimeter in 2012	[1] > 1,000,000	2	11%	4	6%
	[2] 500,000 – 1,000,000	2	11%	5	8%
	[3] 250,000 – 500,000	5	28%	16	24%
	[4] 100,000 – 250,000	8	44%	36	55%
	[5] 50,000 – 100,000; and [6] 25,000 – 50,000	1	6%	5 (4+1)	8%
Type of organisation producing the urban transport plan	Council	12	67%	52	79%
	Public transport authority	6	33%	14	21%
Colour of political majority in the executive of the organisation producing the plan in the 2000s	Left (*PS, PCF, Verts, MRC, PRG* and *divers gauche*)	9	50%	30	45%
	Right (*RPR, UDF, MPF* and *divers droite*)	9	50%	36	55%
Colour of political majority in the executive of the organisation producing the plan in the 2010s	Left (*PS, PCF, Verts, PRG* and *divers gauche*)	13	72%	46	70%
	Right (*UMP, UDI, Nouveau Centre* and *divers droite*)	5	28%	20	30%

Table 1. Descriptive statistics of the sample analysed (N=18) and of the parent sample of French cities concerned by a transport plan (N=66)

Notes : The results for the 2000s for "all cities" in France correspond to the 2001 municipal election results for the city centres of the 66 urban transport perimeters required to have urban transport plans. The results for the 2010s for "all cities" in France correspond to the 2008 municipal election results for the city centres of the 66 urban transport perimeters required to have urban transport plans.

Since it brings together texts produced under similar conditions, our corpus meets the homogeneity criterion required by any computer-assisted discourse analysis. All the documents studied belong to the same "discourse genre" (Maingueneau 2003), that is, a socio-historically constrained communication device that structures texts in specific ways (thematics, structure, style, etc.). For example, most of the 36 documents we study have a generic structure of the type "diagnosis/project/action". Each part of the document has the characteristic of being highly structured and hierarchically arranged through a system of titles and headings. These documents are all written in a standard register and the marks of the writer's presence are erased. All these common features are noteworthy as no specific size or form is required by law (unlike other French planning documents).

This corpus is also large enough to justify the use of a statistical analysis methodology: it represents a substantial set of 1,673,335 words, to which each PDU contributes in a variable way. Since there are no legal requirements as to the format of the PDU, the number of pages varies greatly from one document to another, ranging from 64 pages (Tours, 2003) to 285 (Aix, 2015). Some 55% of the PDUs in our corpus are between 100 and 200 pages long. The number of words also varies significantly from one document to another. Although most texts contain between 20,000 and 60,000 words, we observe a considerable increase in the number of words over time. Documents produced in the 2000s average half the length of documents produced in the 2010s (30,390 words on average for the 2000s versus 61,461 for 2010s).

Our approach focuses on textual data alone and eliminates all of the illustrative components such as maps, drawings and photographs, despite their obvious value (Duhr, 2006). The use of these illustrative elements, in particular photographs, would be worth investigating. For example, the almost systematic presence of photographs of bicycles in PDUs seems to be a tool for building a positive discursive image of the city, featuring the integration of valued social norms. While portraying "social desirability", the means of transport highlighted in the photographs do not correspond to those that predominate in the plans.

A systematic semiological analysis of illustrative elements of plans could provide additional insights into our method and could shed a complementary light on the potential existence of compensation effects between illustrations and texts. Apart from the over-representation of certain transport modes in visual elements, we identified rather a duplication of the textual elements by different illustrative elements in the PDU corpus studied here.

3. Results

3.1. FCA as an exploratory class of analysis

Within the limits of this paper, we will focus on one single class of analysis: a factorial correspondence analysis (FCA) performed on the vocabulary of the corpus presented earlier. Inspired by C. Spearman (Martin, 1997), FCA was developed by the French mathematician J.-P. Benzécri in the early 1970s on the basis of mathematical principles that are well detailed in an abundant reference literature (Cibois, 2014; Murtagh, 2005). This tool, which is closely associated with the "*école française d'analyse des données*" (Benzécri, 1984), has expanded beyond national boundaries (Greenacre and

Blasius, 1994) and is nowadays currently used to design synthetic visualisation of the vocabulary distribution as a function of selected variables.

It is important to understand that this methodology has an exploratory consistency and is usually used for its heuristic potential: its main goal is not to "prove" but to suggest pathways for analysis, by giving a preliminary view of the associations (and contrasts) between the lexical items and certain variables.

In order to identify the similarities (and dissimilarities) between each PDU, and consequently, to examine the factors underlying them, we constructed a contingency table with 36 columns (one for each PDU) and 268 rows corresponding to verbs, common nouns and adjectives occurring at least 500 times within the corpus. At the intersection of a row and a column, the number of occurrences of the unit under consideration for a certain PDU was recorded.

By using these grammatical types and a minimum frequency criterion of 500 occurrences we were able to filter out terms relating to local specificities (e.g. proper nouns for places or elected officials) so as to concentrate on the common base of the discourse and to enable comparisons.

We chose not to limit ourselves to the grammatical type of common nouns. Extending our quantitative statements to the verbs used enables us to take into account enunciative devices (or "ways of saying things") by which the institution portrays itself. Moreover, since the institutional discourse (Krieg-Planque, 2010) tends to contain a plethora of phraseological units, the analysis of the breakdown of adjectives helps to refine the profile of general common nouns. A general term such as "transport" is an invariant in the text: it is only through the use of an adjective (e.g. *public*, *sustainable*) that a specialised meaning is created.

Technically, our analysis is based on lemmas that is to say conventional lexical forms which group all the conjugated forms (e.g. "is", "are") under the same entity (e.g. *"be", "car"*) and erase the plural and gender marks (e.g. "cars"). In other words, in the case of verbs, lemmas are obtained by reducing all conjugated forms to the infinitive. Similarly, nouns and adjectives are reduced to their masculine singular forms.[2] This procedure was used to categorise each of the 1.67 million graphic forms of the corpus by referring them to their corresponding lemma and thus made our data more readable.

This is where the FCA comes into play: it extracts the information contained in this complex table and transforms it into a simplified reading of the main contrasts structuring the vocabulary. Mathematically the construction of such an FCA comes down to calculating distances (of the Chi-square type) between sub-corpora (in our case, between different documents) by taking into account the (relatively) commonly or rarely used lemmas. These distances are then broken down over an ordered series of factorial axes.

After these calculations the resulting FCA (Figure 1) is synthetic and easy to read: the more "central" a lemma is (i.e. when its factorial coordinates are close to 0;0) the more common it is. In other words, these central items have a statistically insignificant profile. On the contrary, a very specific lemma will be plotted towards the edges of the FCA. Two lemmas that have similar factorial coordinates tend to have a comparable distribution within the 36 PDUs (for example the items *link* « lien »[3] and *environmental* « environnemental », on the left side of Figure 1).

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[2] As a reminder, adjectives are not invariable in French: an adjective such as "big" (*grand*) has at least four forms (*grand, grande, grandes, grands*) but one lemma (*grand*).

[3] From this point and for the sake of readability we will quote the lemmas from the corpus by their English translation (*in italics*) followed by the original French lemma (in double angle brackets *« »*).

FCA of the distribution of the most frequent lemmas within the corpus
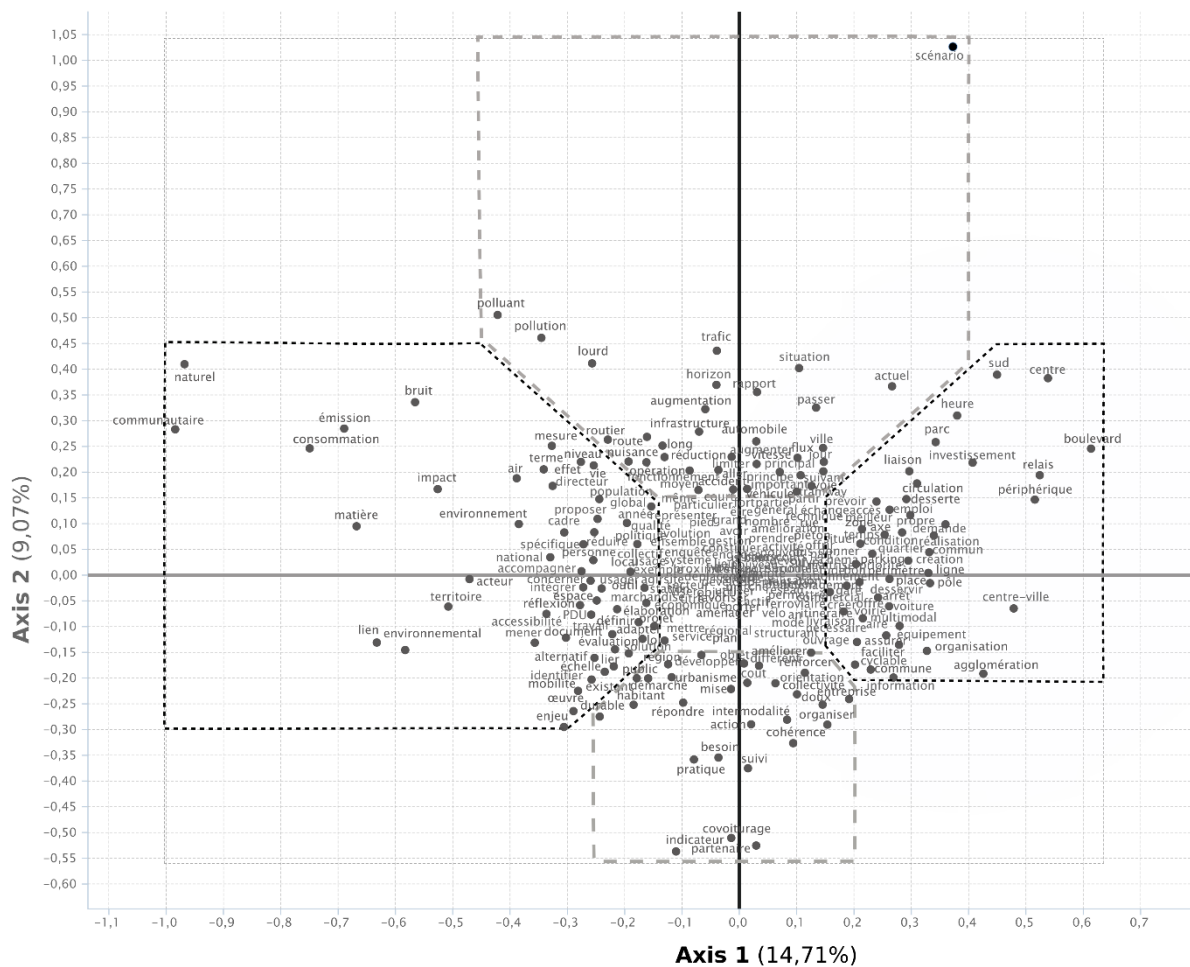
Figure 1 : FCA of the distribution of the most frequent lemmas within the corpus.

We systematically analysed the textual passages in which the outlying (specific) lemmas occur, by using TXM concordancer: with one click, this tool allows a synoptic reading of textual contexts in order to analyse the meaning of a given term. This "back to text" step is essential to avoid over-interpretations and makes it possible to overcome the pitfalls of purely quantitative approaches. For example, we analysed the different meanings of the term *accessibility* « accessibilité ». Going back to the text, the classification of the types of context reveals that out of 1645 occurrences of the lemma, only 248 occurrences (15%) are associated with the idea of geographical accessibility (to different places by different modes). The vast majority of uses of this term refers to the issue of disability and particularly to the access to transport networks or public buildings for the disabled.

3.2. Discursive oppositions following two major sets of contrasts

Figure 1 shows the result of this factorial correspondence analysis. Its two principal factorial axes have 23.78% inertia. This means that nearly a quarter of the general distribution of the 268

lemmas can be explained by the combination of these two axes. Given the very large number of documents analysed in a disaggregated manner, and the large number of lemmas considered, this percentage of inertia is sufficient to understand the main contrasts that structure this corpus.

A fine analysis is then required to interpret the meanings of the axes and whether they bring out contrasting registers attesting to the existence of an opposition or a change over time. After a consistent time spent between the analysis of the synthetic FCA and the analysis of the different contexts of use of the lexical units, we can assert that this PDU corpus is structured around several sets of contrasts statistically corresponding to the two main axes.

In order to identify the lemmas whose distributions structure the two main axes we focus exclusively on the lemmas that contribute markedly to them (Cibois, 2014) on the basis of (|X| or |Y| > 0.15). Then, each lemma is associated with the axis to which it contributes most. These two criteria make it possible to divide the FCA into four specific sectors on which the analysis shall focus (see Figure 1).

Axis 1 is statistically the one that most obviously structures the contrasts in discourse within the corpus (14.71% inertia). First of all, it reflects a split between a very concrete and precise vocabulary concerning transport issues, concentrated on the right side of the graph, and a conceptual vocabulary mainly concerning environmental issues, which is found on the left side of the graph.

Thus, the right side of axis 1 concentrates very specific terms that refer to different real-world objects such as *park-and-ride facilities (*« parc »,« relais »), *ring road (*« boulevard »-« périphérique »), *exchange centre* (« pôle » [d'échange]), *lane* (« ligne », « liaison »), *parking* (« stationnement »); *roads (*« voirie ») as well as precise locations (*downtown* « centre-ville »; *perimeter* « périmètre »; *district* « quartier »; *centre* « centre »; *south* « sud ») and specific time units (*day* « jour »; *hour* « heure »). We finally observe in this area lexical forms linked to the materialisation process of concrete services and objects (*creation* « création »; construction « réalisation ») and their organisation (« organisation »; *to serve* « desservir »; *to provide a service* « assurer »).

On the contrary, the left side of the plan features terms related to environmental issues (*natural* « naturel »; *impact* « impact »; *environment* « environnement »; *emission* « émission »; *noise* « bruit »; *air pollution* « pollution » [de l'] « air »; *effects* « effets ») and terms concerning the question of accessibility for the disabled (*accessibility* « accessibilité »). On this left side, verbs typically suggest a proactive posture (*to lead* « mener »; *to integrate* « intégrer »; *to propose* « proposer »; *to reduce* « réduire »; *to adapt* « adapter »; *to define* « définir »). Nearby, we observe forms that reflect the process of implementation of a PDU itself (« PDU »; « document »; *national framework* « cadre » « national »; *measure* « mesure »; *implementation* « [mise en] oeuvre »; evaluation « évaluation »), and the actors involved in it (*intercommunal actors* « acteur » « communautaire »; *users* « usager »). Finally, this part of the graph suggests a marked abstraction that can be identified by conceptual terms such as *territory (*« territoire ») and *mobility* (« mobilité ») as well as generic terms such as *public space* (« espace » « public »), *challenge* (« enjeu »), *scale* (« échelle ») and *reflection* (« réflexion »).

Axis 2 (9.07% inertia) marks a contrast between several groups of lemmas, some of which are semantically linked with the contrasts noted for axis 1. The first type (*top of the FCA*) essentially shows terms describing recent changes (*increase* « augmentation »; *increasing* « augmenter »; *evolve* « passer » [de... à]; *compared with* [par] « rapport » [à]) and terms forecasting probable future paths (« scenario »; *by* « [à l'] horizon ») concerning classical transport indicators (*traffic* « trafic »; *flows* « flux »; speed

« vitesse »). These indicators concern mostly cars (« automobile ») and more generally road transport (« routier »; *trucks* « [poids] lourds »); and their negative externalities (« pollution »; *pollutant* « polluant »; « nuisance »). To summarise, this upper part of axis 2 encapsulates the vocabulary of diagnosis of a *current situation* (« situation »; « actuel »).

By contrast, the verbs and nouns at the bottom of the plan tend to justify taking initiatives in order to enable changes (*to reinforce* « renforcer »; *to improve* « améliorer »; *to respond to* « répondre » [à]; a*ction* « action »).

As for the left side of axis 1, this lower part of the FCA also groups terms linked with both abstract or conceptual aspects (*practices* « pratique »; consistency « cohérence »; *intermodality* « intermodalité »; *soft [modes of transport]* [modes] « doux »), connected with the markers of the PDU as a process (*monitoring* « suivi »; *indicator* « indicateur »; *urban planning process* « démarche » [d'] « urbanisme » etc.), involving a plurality of actors (*partners* « partenaires »; *inhabitants* « habitants »; *local authority* « collectivité »; *firm* « entreprise »).

3.3.   Combining the two axes to understand discourse transitions

To enhance the readability of the FCA we have categorised the different lemmas which contribute strongly to the axes (|X| or |Y| > 0.15) following the categories previously identified through the analysis by axis. Figure 2 makes it clear that the discursive contrasts presented above are very strongly overlapping with the distinction between the first and second-generation of documents.

In other words, the discourses from 2000 to 2005 correspond statistically to the upper and right parts of the factorial plane. The second generation discourses (2010–2015) correspond statistically more to the lemmas of the left and lower parts of the FCA. We can therefore speak of a predominant discursive trajectory on the scale of our corpus. Out of 18 agglomerations, only one (*Aix-en-Provence*) does not geometrically follow this trajectory.

Main discursive contrasts within the PDU corpus (2000-2015)

Figure 2 : Main discursive contrasts within the PDU corpus (2000–2015).

Traces of this diachronic trajectory can thus be broken down into four trends which interact with each other. First of all, an increasing use of abstract vocabulary can be pointed out (Figure 2, in yellow). This evolution is indicative of the shift from a technical document with a descriptive consistency centred on precise and concrete real-world objects (in dark blue) and precise terms concerning time and space (in purple), to a fully institutional document with a programmatic consistency, focused on issues of higher complexity. It should be noted that from 2010 onwards, the documents reflect a greater drafting effort, incorporating a higher proportion of complete sentences, to the detriment of verb-less sentences and the list format characteristic of earlier "technical" versions.

The second trend is an increased use of terms symptomatic of environmental concerns, logistics and accessibility issues for people with disabilities (in pale pink). Needless to say that the higher frequency of use of these terms may be regarded as strongly driven by the new legal expectations of urban transport in the 2000s.

The third trend observed concerns a change in the posture displayed by the producer of the text: in the second generation texts, the verbs support a portrayal of the producer of the document as a proactive agent. By dint of exhortative verbs (in red), this discourse justifies the implementation of actions as a positive way to improve the current situation.

The fourth (and last) trend is based on the actors mentioned in the PDU. In the first generation of texts, few actors are mentioned. In the second generation, the actors involved in the implementation procedure are mentioned far more frequently.

To sum up, two models can be made out. The first model, which can be characterised as *"concrete precise and descriptive"*, tends to cluster urban transport plans drafted in response to a statutory duty in a rather descriptive register concretely listing and precisely stating the arrangements

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to be put in place. Very few actors or items of procedure are mentioned in this first model. The focus is on the technical realisations considered as a reaction to a rather unpleasant current situation. This is more the case of the first generation of transport plans dating from the years 2000 to 2005. It is worth recalling here the context surrounding the creation of this document: at this time the French central government was having the greatest difficulty in getting local authorities to implement their first PDU. By way of illustration, here is one (translated) example of the "concrete precise and descriptive" model characterising plans of the years 2000 to 2005.

> The **parking organisation** on the inner **boulevards** is one of the major levers to encourage a modal shift from **cars** to **public transport** for working people and students. It concerns the gradual reduction of on-street **parking** spaces, partially offset by the **construction** of **underground parking** facilities on the **boulevards** (observed from the *Pont du Cange* to *Place Voge*, via the *Cirque*) to 600 spaces from the current 2550. (Amiens 2002)

A second model of transport plan ("abstract proactive and cooperative") presents verbs of action that highlight the proactive attitude of the city in taking in hand issues of urban travel. Although this might seem paradoxical at first sight, such verbs are paired with highly abstract terms. This model affords greater precision about local governance (actors, and implementation phase). By way of illustration, here is one (translated) example of the "abstract proactive discourses" characteristic of transport plans of the years 2010 to 2015.

> The main **challenge** of the PCET in transport is to align and articulate a **mobility** strategy around the tramway and the Ginko network to **promote** modal shift through various key actions: **developing** alternative modes to the private car, **modifying** the parking supply, **encouraging** the adoption of new **practices** (cycling, car sharing, carpooling, etc.) and **proposing** efficient and adapted advice to coordinate the whole. (Besançon 2015).

4. Discussion

The factor analysis set out in the previous section shows that the discourse in French urban transport plans can be largely explained by its rooting in time. Consequently, the discussion shall first centre on this change in discourse over time before focusing on the perspectives offered by such a method.

4.1 From the 2000s to the 2010s: a major discourse transition in French urban transport plans

Urban transport plans changed a good deal in the course of the 2000s, bringing cities to showcase their intentions, their partners and their capacity for action; paradoxically, these were expressed in a very imprecise register with respect to the subjects those actions would bear on. What explanation can be given for this transition in transport planning documents towards this paradox combining willingness to act, clarification about the procedure and partners involved, and more abstract content?

Three lines of enquiry seem worth considering. A first line would be to consider the change in these documents as a sign of the assertion of the power of the city relative to central government, boroughs, organised civil society and inhabitants. Interestingly, two of the terms that contribute statistically the most to axis 1 are *intercommunal* (« communautaire ») and *territory* (« territoire ») which are often combined. The widespread use of « territoire » is well identified in the literature as marking a determination to build up and assert power (Barreteau et al., 2016). The over-representation of proactive verbs of action may also be understood as part of this process of displaying and legitimising the power of the city.

The *proactiveness-abstraction* pairing can also be used for more "tactical" purposes. Compared with the risk of a legal appeal against the document, the use of more abstract terms means there is no need to show one's "cards" so they can be kept for when it comes to negotiations about infrastructure funding (with central government or regional councils) or the sharing of space for the various modes of transport (more with special interest groups) (Reigner and Hernandez, 2007). It should be noted that one case of PDU refusal by a Prefect occurred in Grenoble in 2006, exactly between the two waves analysed. This decision followed appeals by several associations (cyclists and pedestrians) on very specific and concrete issues, including mode sharing in a new urban tunnel project. This refusal probably set a precedent and led to a more pronounced taste for abstraction in the second generation of PDUs (Reigner and Hernandez, 2007). Moreover, in times of budgetary restrictions and uncertainty for French cities (notably less financial support from central government), a more abstract discourse means that an overall direction can be given with less concern for concrete projects, for which there is no guarantee they will be financed (and especially jointly financed with other tiers of government) or accepted by the population. The results presented here are in line with recent findings on the role of ambiguity in the political process of public policy-making: abstraction and ambiguity seem to have the power to cement coalitions between groups of actors (Jegen and Mérand, 2013). The precise listing of the items of procedure and actors involved is another sign of how easy it is to bring a larger coalition together when discourses are more abstract.

Lastly, changes in the actors involved in drafting urban transport plans are a third line of enquiry explaining the shift towards proactive and abstract discourses. From the late 2000s consultants in public communication have become increasingly involved. This phenomenon completes a broader transformation of the role of mayors and elected officials. For the last three decades in France these actors have tended to overlook local political management functions (such as cultural associations and sports clubs, etc.) concentrating instead on functions of strategic policymaking that are considered "profitable" in terms of public opinion (Pinson, 2014). This new political situation leads to the systematic involvement of consultants in public communication and consequently to greater use of consensual, pragmatic and abstract forms of speech (Pinson, 2014) at the expense of the technical actors and transport planners.

4.2. Perspectives for a textometry-based method in urban policy discourse analysis

These points of discussion highlight the value of what is both a quantitative and qualitative systematic method for studying discourses that accompany and justify urban policies. The predominant discursive trajectory from '*concrete precise and descriptive*' discourses to '*abstract*

proactive and cooperative' ones is an original result. Although criticisms were directed at the first generation of PDUs characterising them as '*wishy-washy*' or '*non-conflictual*' (Offner, 2006) no other method has identified this predominant transition of PDUs to even less concrete and precise content.

Therefore, textometry seems to be effective, in conjunction with classical methods, at identifying continuity, change and other transitions that supposedly cannot be spotted by the "naked eye". Even though a "classical" (i.e. non-instrumented) human reading would have been sufficient to identify the terms related to new legal expectations (environmental evaluation, accessibility for the disabled, etc.), it is very unlikely that stylistic features (such as proactive verbs or conceptual nouns) would have been spotted in such a corpus. And yet these elements are key to understanding discursive transitions.

Textometry applied directly to planning documents can identify predominant trajectories and exceptions (here Aix-en-Provence), and it makes it possible to build new hypotheses and test them with other textometry tools (specificity analysis, co-occurrences) or complementary methods (such as explanatory interviews).

This method may well renew urban policy discourse analysis because it can identify contrasts between discourses and track them over time. Analysed as an "event" in a longer duration "series" of which it is part, the planning document then becomes the indicator of a balance among opposing discursive forces and, by extension, among multiple actors. Ideologies and strategies can be identified by comparing such situations in time and space.

> [...] it seems to be by pushing to its extreme the fine grain of the event by stretching the resolution-power of historical analysis as far as official price-lists (*les mercuriales*), title deeds, parish registers harbor archives examined year by year and week by week that these historians saw – beyond battles, decrees, dynasties or assemblies – the outline of massive phenomena with a range of hundreds or many hundreds of years. (Foucault, 1971: 57; *translated by* Young, 1981: 68)

Although the method developed here is concentrated for the moment on a decade, it frees urban policy discourse analysis from the specificities of the "event" and analyses it as part of a larger geographical and temporal series. In this way, the textometry approach can reconcile approaches that enquire into discursive materiality and poststructuralist approaches by identifying and situating social actors' ideologies and strategies through a focus on the text.

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