From text to corpus: a contrastive analysis of first person pronouns in economics article introductions in English and French

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Abstract

This contrastive study focuses on the functions of first person subject pronouns in economics article introductions in French and English. It combines a qualitative analysis of the way the pronouns are used within a typical CARS (Create a Research Space) -type introduction (Swales 1990, 2004) with a more quantitative concordance-based analysis of the varying authorial roles played by the pronouns and their distribution within the different rhetorical moves of the introductions. The text-to-corpus approach adopted gives rise to a number of recommendations concerning the combinations of discourse analysis and corpus investigation for teaching purposes.

Key words: first person pronouns; authorial roles; economics research article introductions; CARS move model; English-French contrastive analysis; corpora and language learning.

1. Introduction

Academic writing, and the research article in particular, has been the subject of a considerable body of applied research aimed at underpinning the needs of non-native users of English wishing to study and publish in English (Swales 1990, 2004; Hyland 1996, 2001, 2002). Although this research has frequently been conducted from a contrastive viewpoint (comparing different genres or disciplines, or comparing native and non-native speaker productions), the number of studies involving research on academic writing in languages other than English has been far more modest (see, for example, Fløttum 2003; Carter-Thomas 2007). This is partly due to the increasing hegemony of the English language, particularly in the 'harder' sciences, which makes it problematic to compile truly comparable corpora of similarly reputed research articles in different languages (Swales 2004: 244). However, in the 'softer' field of economics, research journals in languages such as French continue to co-exist alongside their English counterparts. We believe therefore that a contrastive analysis of economics articles in English and French can

have applications, both for teachers of French academic writing outside France and for teachers of English academic writing in France.

The research context of this study is thus that of contrastive approaches to academic writing and pedagogical applications arising from research in this area. After briefly discussing issues relating to qualitative and quantitative approaches to the analysis of academic writing, with particular reference to pedagogical applications of corpus data (section 2), we move from the analysis of features in a single article in English and in French to a corpus-based study of those features (section 3). A corpus of the introductions to 100 research articles in economics, 50 in English and 50 in French, forms the basis of the study, taken from the University of Bergen KIAP corpus (Fløttum et al. 2006). One article introduction corresponding as closely as possible to the prototypical CARS (Create a Research Space) model (Swales 1990, 2004) is selected from this dataset in each language. Particular attention is paid to the role and distribution of first person pronouns within the three main moves of the introduction: *Establishing a territory, Establishing a niche and Ocupying the niche.* Concordance-based searches in the French and English subcorpora are then combined with authorial role analysis in order to provide a more complete picture of pronoun use in article introductions in both languages (section 4). The aim is to illustrate, in the final section (section 5), how concordances can enhance the learning and teaching environment by providing multiple examples of the small number of occurrences which the learner is likely to encounter in a single text.

The decision to focus on first person pronoun use in the economics introductions was prompted by two main considerations. Firstly the choice of which (if any) pronoun to employ can be problematic for non-native speaker and novice researchers alike. Numerous differences between disciplines and language groups (Hyland 2001; Lafuente-Millán 2010; Vassileva 1998) as well as between the different sections of articles (Martinez 2005) make generalisations perilous, and only a corpus-based analysis can provide a reliable source of information in this respect. The second reason is that a preliminary keyword search carried out in the French and English datasets revealed some striking differences between the figures for the different first person pronouns in the two languages, which the contrastive analysis proposed in this chapter will attempt to elucidate.

2. Academic corpora and language learning: Combining quantitative and qualitative approaches

Despite the existence of large corpora of academic writing, for example the academic writing component of the British National Corpus or the KIAP corpus (Fløttum et al. 2006), research in this area is not dominated

by quantitative approaches. As Lee (2007: 88) notes, a combination of qualitative and quantitative analysis accounts for the vast majority of corpus-based research, contrary to what might be expected. Furthermore, the combination of the qualitative study of individual texts and quantitative data from a corpus of texts within the same genre, is emerging as an important development in discourse analysis, namely corpus-assisted discourse studies or CADS (Baker 2006).

The same concerns can be noted in the work of a number of researchers in the area of corpora and language learning. Charles (2007: 290), for example, argues that a pedagogical approach combining discourse analysis and corpus investigation is needed rather than a simple study of lexico-grammatical patterns:

> I would argue that one of these key issues is that the use of corpus consultation to explore a series of lexico-grammatical patterns does not in itself add up to a coherent set of teaching materials. Rather, it is essentially an individual response to individual problems. If corpus work is to be incorporated routinely into the class teaching of academic writing, then it is up to its proponents to show that it can also help students to tackle their higher level discourse concerns.

Flowerdew (2002, 2008) advocates an approach which makes it possible to associate lexico-grammatical patterns with their functions. Although not primarily focusing on teaching applications, Biber *et al.* (2007) underline the importance of combining quantitative and qualitative analyses. Several chapters stress the importance of using corpus-based approaches within move analysis in order to obtain more generalisable descriptions of discourse organisation.

The researchers who created the KIAP corpus, on which the present study is based, also used both quantitative and qualitative methods. Analysis of pronouns or citation patterns, for example, allowed them to focus on issues such as cultural differences (Fløttum 2003) and gender (Gjesdal 2005). In these studies and in others carried out by the KIAP team, the focus was, however, on the linguistic analysis of the texts, and not specifically on the pedagogic applications. Our own research aims to add to the combination of quantitative and qualitative approaches by focussing on the CARS model, and also to add a pedagogic dimension to the existing studies based on the corpus.

Our study is further influenced by the work of a number of researchers in the ESP field. Firstly Swales's (1990, 2004) analysis of research article introductions in English provides a useful starting point for the contextualised analysis of the first person. The CARS model identifies three main moves in the prototypical introduction:

> 1. Establishing a territory: claiming centrality, and/or making topic generalizations, and/or reviewing items of previous research;

2. Establishing a niche: counter-claiming, or indicating a gap, or question-raising, or continuing a tradition;
3. Occupying the niche: outlining purposes or announcing present research, announcing principal findings, indicating RA [research article] structure. (Swales 1990: 141)

As we shall see, the use of the first person is particularly in evidence in the last of these moves, for presenting the structure of the research article (RA), but other functions of the first person can also be identified elsewhere in the introductions. As several past projects concerning writer presence in research articles have noted, first person pronouns are used to fulfil a wide range of rhetorical functions, enabling authors to adopt a number of different roles or personae with varying degrees of authorial presence (Hyland 2001, 2002; Lafuente-Millán 2010; Tang & John 1999; Vassileva 1998). Different taxonomies have been suggested. Hyland, for example, identifies four basic functions: Stating a purpose, Exploring a procedure, Elaborating an argument and Stating results or claims, with the first two functions reflecting a much lower degree of personal exposure than the last two (2002: 1100). Lafuente-Millán (2010), drawing on and developing Hyland's 2002 classification, establishes seven categories for the use of exclusive *we* (structuring the information, stating a goal, explaining a procedure, stating expectations, expressing strengths or limitations, stating results, making claims). The more broadly based verb-oriented classification proposed by the researchers working on the KIAP[1] project (Fløttum 2004, 2006; Fløttum et al. 2006; Dahl 2009) is, however, particularly suitable for combining with the CARS model, in terms of analysing which verbs and author roles are preferred within which moves. Focusing primarily on the semantics of the verb, three main author roles are identified:

1. The author as *writer*, typically manifested by **discourse verbs**, referring to the writing process or to the organising of the article, like *describe, discuss, illustrate, outline, present, repeat, show, summarize* and *begin by, focus on, move on, (re)turn to, conclude by.*
2. The author as *researcher*, typically manifested by **research verbs**, referring to the research process itself, like *analyse, assume, consider, choose, compare, explore, find, follow, limit, study, test, use.*
3. The author as *arguer*, typically manifested by what we call **position verbs**, denoting processes related to position and stance, concerning approval, promotion or rejection, like *argue, claim, dispute, maintain, propose, reject, think.* (Fløttum 2006: 26)[2]

Our study of concordances of the first person in 50 RA introductions in each language aims to investigate how these categories relate to Swales's moves, providing quantitative data to enhance the study of individual introductions with a greater number of examples, a process which Cobb (1997: 303) calls "multicontextual learning".

3. Corpus and methodology

The study is based on a corpus of 100 RAs in economics, 50 in English and 50 in French, taken from the University of Bergen KIAP corpus (Fløttum et al. 2006). They were extracted from three thematically similar peer-reviewed journals in each language, published between 1998 and 2003.[3] Although the native-speaker status of authors cannot be determined with certainty, we consider that, as expert writers and successful members of their respective professional communities, their writing conforms to an implicitly defined native-speaker norm. Given the small number of texts involved, it is clearly not possible to make overall generalisations about the use of pronouns in article introductions in economics. What the contrastive data do provide, however, is useful attested examples of language use in this very specific context for language learners and teachers. As Aston (2001: 75-76) notes, referring to his use of a sub-corpus of lectures from the BNC:

> There are nearly 50 lectures overall, on a wide range of topics and by a fair variety of lecturers, and it has proved a useful collection from which to retrieve examples of particular discourse phenomena for teaching purposes and from which to generate hypotheses about the ways that lectures seem to work. Useful, that is, as long as you don't try to interpret it as a 'representative sample' allowing reliable generalizations about lectures as a genre.

Gavioli (2005: 72) also stresses the importance of distinguishing between "samples" and "examples". As we shall see, this advice is particularly appropriate for this study. Although the results should not be over-generalised, the analysis of a small discipline-specific corpus nevertheless reveals interesting differences between the uses of the singular and plural first person pronouns.

As all the articles in the corpus contained well-identified sections, we were subsequently able to create a separate corpus consisting solely of article introductions. The complete article corpus and the smaller introductions corpus both contained a very similar number of total running words in each language, greatly facilitating the inter-language comparison (Table 1).[4]

Table 1: *The corpora of article introductions*

		Word total
Article corpus	50 French RAs	295,859
	50 English RAs	298,319
Introductions corpus	50 French introductions	49,231
	50 English introductions	48,455
Single-author articles	31 French introductions	30,528
	23 English introductions	26,075

Another important criterion for us was the authorship in each subset. Whereas articles in engineering, medicine or the natural sciences typically have several authors, in economics, both collectively-authored

(CA) and single-authored (SA) articles are common. The articles in the two economics language groups reflect this tendency, being fairly equally split between CA and SA-authored articles. This possibility of being able to distinguish between CA and SA articles is obviously of crucial importance when it comes to discussing the distribution of first person singular and plural pronouns (see Section 4.3 below).

3.1. Methodology: From individual RAs…

Our starting point was the selection in each language of one RA introduction of the type we could imagine the teacher of Languages for Specific Purposes (LSP) selecting for detailed study with students. The introductions were therefore chosen to illustrate as clearly as possible the prototypical Swalesian CARS moves (1990, 2004). It is important to note that although in our data it was fairly easy to find article introductions to illustrate the CARS model, a considerable amount of variation can exist in the structure of RAs in general, and of introductions in particular. Samraj (2002) and Ozturk (2007) have both noted, for example, substantial variety in the organisation of introductions both within and between disciplines. Fløttum (2006: 36-37), noting that "the typical research article does not exist", emphasises nonetheless that it is important to identify traits which are typical of research articles. In the same way, even though the typical research article introduction does not exist, elements of the CARS model can be found in most of the article introductions in this corpus, thus making it appropriate to include in a course focussing on introduction writing. It is an approach similar to Fløttum's which is adopted here, identifying traits which are found in a number of the research article introductions, so that learner writers can incorporate them creatively in their own writing, rather than a giving a prescriptive recommendation of the CARS moves as the model to be followed. It is also beyond the scope of the present chapter to investigate whether the CARS model is more (or less) characteristic of articles in English than articles in French. Whilst this model seems to hold good for both languages, it is difficult to determine whether this is because it has also developed in research cultures in French independently of its use in English, or whether it is as a result of the dominant influence of English in research circles.

In the combination of qualitative and quantitative methods which this article is advocating, the roles of first person pronouns were firstly examined just within the two prototypical introductions selected, thus replicating the type of analysis which might happen in a class using materials based on these introductions. We identified the discourse moves in which the pronouns occurred and the precise rhetorical role they played in the creation of the research space. This initial emphasis on the higher level discourse roles of the pronouns, within the CARS model, provided the contextual background for the subsequent concordance-based searches over the entire Introductions subcorpus.

3.2. ...to corpus examples

All the occurrences of first person pronouns were counted and sorted so as to gain a maximum of quantitative information, and the concordance lines examined in the context of the verbs with which they were used. Particular attention was also paid to various metatextual expressions accompanying the pronoun / verb combinations in both languages. The objective of this analysis was not only to allow us to identify some of the preferred patterns in each language, but also to suggest differences in authorial positioning between the two language groups. The presence of first person pronouns can be taken as one of the most explicit indications of authorial positioning or stance by writers (cf. Hyland 2002). Using first person pronouns allows authors to construct a particular authorial identity or position with regard to the material they are presenting.

Basing the analysis on the verbal and authorial categories distinguished by the KIAP team (cf. Section 2: author as writer, author as researcher, author as arguer), the pronoun / verb combinations were attributed to one of these three categories and their distribution amongst the three CARS moves was analysed to determine which author roles were primarily represented. While in the case of *I* and *je*, the singular pronouns can be taken to always refer to the author, the case of *we* and *nous* is more complex. All plural pronouns taken as referring either exclusively to the author or authors or inclusively to author(s) and readers were retained for analysis, but we have excluded from the analysis all generic uses of *we / nous* where the author or authors do not seem to be included in the reference and the value is closer to that of an indefinite 'one' (e.g. *In community life we have interactions with many types of people*). After these adjustments, the remaining occurrences were categorised according to the KIAP classification where the verb meaning (discourse, research or position verb) is taken as the primary criterion, along with any accompanying contextual clues.

The third part of the study focuses on a comparison of first person singular and plural form in both languages. In order to adequately compare the very different distributions of *I/we* and *je/nous* in the two languages (cf. Tables 4 and 5 below), we have restricted our analysis to only single-authored articles in this part. Drawing on the analysis accomplished in the previous section on authorial roles, our objective was to analyse and provide examples of the *I/we* split in the English subset in comparison with the very pronounced use of the plural form amongst the French authors. While this issue is relevant to the whole article and not just to the introductions, it is nevertheless also highly relevant to this study as a discoursal choice which a single author has to make when writing an introduction.

4. The author's voice: Author roles and the CARS model

4.1. Learning from a single article

In both article introductions selected for the initial analysis the CARS moves are, as explained above, easily detectable (see Appendices A and B for the complete texts of the introductions). The three paragraphs of the English introduction each correspond to one of the Swalesian moves. After explaining the centrality of the research issue in the first paragraph (the term *key* appears twice), a niche for the present research is created in the second, whilst the objectives of the article and its organisation are outlined in the third. All three occurrences of the first person pronoun occur within the final paragraph of the introduction and participate in the move *Occupying the niche*. Although the verbs *use* and *find* are typically research verbs (cf. above), the presence of the formulaic metatextual indication *In this paper* with the verb *layout* at the outset of the paragraph clearly suggests that the predominant authorial role is that of writer. The authors are outlining the structure of the article, listing the order in which points will be dealt with:

(1) *In this paper, we lay out* an example of a political agency model with a role for media in enhancing government responsiveness.
(2) *We then use* data for the period

In the third example one of the main research findings is previewed:

(3) *We find* that states with greater newspaper circulation, literacy and electoral turnout are also those that have the most responsive governments.

As we shall see when analysing other concordance examples, it is not unusual for verbs to play dual roles in this way.

The French article introduction selected contains four paragraphs. The first two paragraphs *establish the territory*. The general objectives of the article are stated against the backdrop of the considerable body of existing research in the field. In the third paragraph a niche for the present research is made by underlining the differences and specific contribution of the author(s) with regard to one of the past research items previewed, and in the fourth paragraph the structure of the article is explained. As in the English article introduction, all the occurrences appear towards the end of the introduction. However, the five occurrences of the plural subject pronoun *nous* and the possessive *notre* seem to be used rather differently compared with the English introduction. The first four examples are used in contexts where the author is concerned with *establishing the niche.* The pronominal expressions are combined with research verbs: *supposer* (*to*

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hypothesise), *se différencier* (*to be different from*) and *montrer* (*to show*). They refer to the research process itself, showing how the research presented makes a specific contribution to the research existing on the subject:

(4) Par rapport à CZ, *nous supposons* l'existence de deux régimes distincts d'allocations chômage.
[In contrast to CZ, we presume the existence of two distinct unemployment benefit regimes]

(5) Enfin**,** *notre* modèle se différencie de CZ par la définition du point de menace des syndicats.
[Finally our model differs from that of CZ it the way it considers trade union threats]

(6) En cas de rupture des négociations, *nous supposons* que le contrat de travail des insiders n'est pas rompu indéfiniment, mais qu'il fait seulement l'objet d'une suspension temporaire (…).
[If negotiations break down, we assume that the employment contract of insiders is not breached indefinitely, but that it is only temporarily suspended (…)]

(7) *Nous montrons* alors que le taux de chômage est d'autant plus élevé que l'allocation assurancielle est fortement indexée sur le dernier salaire reçu.
[We thus show the unemployment rate is correspondingly higher when the insurance benefit is indexed to the last salary received.]

In the final example, *nous* is used in a sentence outlining the organisation of the article. As in the three English examples above, it is the writer role (where the author takes on the role of the readers' guide) that is adopted:

(8) Dans la section suivante, *nous présentons* la structure du modèle.
[In the next section, we present the structure of the model]

The discussion of these examples from the two prototypical introductions shows some of the functions the pronouns can take on in economics article introductions. This context-sensitive approach is, we would contend, important for fully understanding personal pronoun functions within the overall RA structure. However this is only part of the picture. It would be unadvisable to draw any conclusions about pronoun use in economics introductions – and even more so about contrastive pronoun use – on the basis of a single example. Not all features of pronoun use can be found in one introduction and the concordances will obviously provide many more examples than one introduction can (see 4.2). Another important factor to take into consideration is the authorship of the article. The English article is a

collectively-authored, whereas the French article has only a single author. The question of reference – i.e. to whom the plural pronouns refer – can also influence the rhetorical role assumed by the pronouns (see 4.3).

4.2. 'Multicontextual learning': The contribution of corpus data

4.2.1. Quantitative data
A quantitative analysis of the pronouns used in the article introductions and of the verbs used with them reveals a number of distinctive patterns in the use of verbs. Firstly, Table 2 shows the distribution of all first person pronominal forms in the singular and plural.

Table 2: *Pronouns in the article introductions*

English		French	
Pronoun	Occurrences	Pronoun	Occurrences
I	51	*je*	2
me	3	*me/moi*	0
my/mine/myself	0	*ma/mon/mes/mien/mienne* */miens/miennes/moi-même*	0
we	267	*nous (subject)*	224*
us	9	*nous (object)*	33
our	112	*notre/nos*	51
ours	0	*nôtre/nôtres*	5
ourselves	0	*nous-mêmes*	0
Total	442		315

* 18 pronominal verbs are counted as one occurrence of the first person plural in each case, not two, for example *nous nous intéressons* is counted as a single occurrence.

These occurrences show the overall dominance of first person subject pronouns in both languages, with a greater number of occurrences in English (51+267=318 as opposed to 2+224=226 in French, approximately 72% of the total number of first person pronouns in both cases). The study of the verbs used with *we/I* and *nous/je* as subject pronouns, both in relation to the CARS model and to the author roles, thus enables us to study the majority of the occurrences of the first person in the introductions. Table 3 shows the ten most frequently occurring verbs in each language (where more than one verb figures in tenth position, all verbs with this frequency are included).

Table 3: *Frequent verbs in the French and English introductions*

English – *I/we*		French – *je/nous*	
find	23	*montrer*	32
show	19	*proposer/se proposer*	18
use	19	*supposer*	12
argue	13	*considérer*	9
consider	11	*présenter*	8
move	11	*utiliser*	7

present	9	*analyser*	7
estimate	8	*étudier*	6
provide	8	*s'intéresser*	6
allow	7	*souhaiter*	4
examine	7	*introduire*	4
		obtenir	4
Total	135		117

In each language, a small number of verbs accounts for a significant proportion of all occurrences of verbs with the first person subject pronoun. In the case of English, 11 verbs account for 135 occurrences out of 318, while in French 12 verbs account for 117 occurrences out of 226. However, in addition to these, a very wide variety of other verbs are used by the authors, thus making a qualitative approach to the study of the author roles in the CARS model the most appropriate way to analyse the concordance data.

4.2.2. Verbs and moves: Three author roles

All first person subject pronouns and verb combinations in the economics introductions corpus were classified in terms of the KIAP author roles. These three main author roles are illustrated in the following examples:

Author(s) as writer:
> (9) Finally, *we briefly characterize* some stylized facts regarding our estimated stocks
> (10) In Section 2, *I outline* the model.
> (11) Dans un premier temps, *nous présentons* la réglementation du chômage en France de 1986 à 1996
> [Firstly, we present the unemployment legislation in France from 1986 to 1996]
> (12) *Nous abordons* cette question dans la section 4.1 de cet article
> [We deal with this issue in Section 4.1. of this article]

Author(s) as researcher:
> (13) The basic analytical framework *we adopt* is an extension of Turnovsky's (1993) model
> (14) For this purpose, *we introduce* labor, which we assume is supplied inelastically. The second objective is the calibration exercise.
> (15) L'hypothèse que *nous formulons* est que la connaissance (auto-déclarée) des experts est le facteur explicatif le plus important dans la compréhension du comportement mimétique.
> [Our hypothesis is that the (self-declared) knowledge of the experts is the most important factor in the understanding of mimetic behaviour]

(16) Plus précisément, *nous utilisons* des données de ménages ruraux du Pakistan

[More precisely, we use the data on rural households in Pakistan]

Author(s) as arguer:

(17) *We adopt* the view that enforcement issues are central to the design and understanding of international agreements

(18) *We argue* that explicitly allowing for this decomposition is important both theoretically and empirically

(19) *Nous soutenons* in fine qu'il est possible de concilier efficacité et équité

[We claim in fine that it is possible to combine effectiveness and fairness]

(20) *Nous rejetons* donc l'interprétation

[We therefore reject the interpretation]

It is important to note that this classification is a difficult one, particularly in relation to distinguishing between the roles of writer and researcher. Metatextual expression of text structuring (*Finally*) or specific deictic expressions (*In this article*) can, for example, sway the analysis in favour of the *author as writer* interpretation whatever the semantics of the verb. The picture which emerges is that of a considerable amount of overlapping between these two roles. The aim however is not to provide a definitive classification, but rather to show the variation of author roles within the CARS model and to provide a basis for comparison between the two author groups.

Table 4: *First person roles in the English corpus*

	We	*I*	Total *We + I*
Writer role	93 (34.8%)	28 (55.0%)	121 (38.0%)
Researcher role	138 (51.7%)	16 (31.4%)	154 (48.4%)
Arguer role	28 (10.5%)	7 (13.7%)	35 (11.0%)
Generic *we*	8 (3.0%)		8 (2.5%)
Total no. of occurrences	267	51	318

The breakdown of authorial roles in the English corpus is shown in Table 4. The writer role is, as expected, very prominent in the introductions, representing almost 35% of all occurrences of *we* and 55% of those of *I*. As in the examples seen in the single introduction cited above, these occurrences typically occur within the move *Occupying the niche*, in the step where the authors outline the article structure. We find a variety of verbs, of which roughly half are also accompanied by a metatextual indication (examples 21-25):

(21) *In Section 4 we argue* that discriminatory punishment is optimal

> (22) *In Section 2.2, we describe* how the model can be used to analyze the emergence of overlapping
> (23) *In Section 1, I describe* the welfare gain function.
> (24) *In Section 2, I use* stock returns
> (25) *I focus on* the identification problem *and I indicate briefly* how identified quantities may be estimated from finite-sample data

The particularly high proportion of *I* used in this organising role will be discussed in Section 4.3 below.

However it is overall the researcher role that is the dominant role in the English economics introductions. An analysis of the concordance lists and their distribution within the introductions reveals that they are used both for *Establishing the territory* (examples 26-27) and *Establishing the Niche* (examples 28-29):

> (26) The basic analytical framework *we adopt* is an extension of Turnovsky's (1993) model,
> (27) In a related paper (Murphy, 1999), *I explore* some counter-intuitive implications of this policy tradeoff and show
> (28) Thus, whereas von Thünen's regional analysis assumed that workers could move costlessly between locations**,** *we interpret* locations as countries and assume that workers (and other factors of production) are geographically immobile. *We also work* with a more general production structure than is usual in these models, allowing commodities produced in the centre to be produced elsewhere
> (29) *I modify Baldwin and Ottaviano's model* by introducing asymmetric network effects

The first person pronoun is used to help authors situate their research within the body of existing literature and at the same time to pave the way for their own specific contributions to the research effort.

The arguer role, showing the direct commitment of the author(s) to the research claims, represents only 11% of occurrences. To some extent this is unsurprising. One would expect the arguer role to be much less prominent in introductions than, for example, in discussions. However it is interesting to note that this role is nonetheless present in the introductions, and that on occasion researchers do not hesitate to adopt this fairly "high risk" (Hyland 2002: 1103) writer stance :

> (30) *We believe* that these findings are further evidence that antidumping law is not (…)
> (31) *I argue* that the social distinctions between marriages and informal relationships is (…)

All three roles are thus present in the English introduction corpus, with the researcher and writer roles more prevalent than the arguer role.

Table 5: *First person roles in the French corpus*

	Nous	*Je*	Total *Nous + Je*
Writer role	67 (30%)	1 (50%)	68 (29%)
Researcher role	120 (53.5%)	1 (50%)	121 (54.5%)
Arguer role	37 (16.5%)	0	37 (16.5%)
Total no. of occurrences	224	2	226

The distribution of the three roles in the French corpus is presented in Table 5. As in the English corpus, the writer role in the French subset is present, although somewhat less pronounced than in the English introductions corpus (29% vs 38%):

(32) Dans la troisième section, *nous explicitons* le modèle économétrique sur lequel s'appuient les analyses empiriques
[In the third section, we detail the econometric model on which the empirical analyses are based]

(33) Après présentation du modèle en Section 2, *nous analysons* les politiques optimales de prix unique et de discrimination
[After presenting the model in section 2, we analyse the optimal policies of single prices and discrimination]

The researcher role, as in the English corpus, is the predominant one:

(34) Nous nous différencions de la littérature existante en recourant à une technologie
[We differ from the existing research literature by using technology]

(35) À la suite de MA [1994], CHALKLEY et MALCOMSON [1998], nous supposons que les consommateurs parfaitement assurés ont une demande en fonction de la qualité des soins
[Following MA [1994], CHALKLEY & MALCOMSON [1998], we presume that the demand of fully insured consumers is linked to the quality of care]

Many of these examples with an exclusive *nous* occur, as in the English corpus, within the move *Establishing the Niche*. In (34) and (35), for example, the authors are at pains to situate their own research contributions within the existing literature.

The arguer role, illustrated in the examples below, is also present, but in third place, as in the English texts.

(36) *Nous rejetons donc* l'interprétation à la BARRO.
[We therefore reject an interpretation along the lines of that of BARRO.]

(37) *Nous avançons alors* une conjecture sur la capacité de certains contrats agricoles assez répandus à permettre aux ménages de mieux s'assurer contre les risques
[We therefore put forward a suggestion concerning the capacity of certain quite common agricultural contracts to allow households to better insure themselves against risks]

In conclusion, while the distribution of roles in the French corpus varies slightly from that of the English corpus, the overall picture is the same, with the researcher role dominating, followed by that of writer, with the arguer role present, but less frequently used than the others.

There is no simple one-to-one correspondence between authorial roles and moves. The analysis of the Introductions corpus has demonstrated a far greater variety of authorial roles and functions than the focus on just the two model introductions could reveal. It is however possible to predict the likelihood of certain roles occurring within specific moves. The researcher role, for example, appears likely to occur both within the *Establishing the territory* and *Establishing the niche* moves. First person pronoun and verb combinations are used both to situate the research within the literature (see examples 26-27), and to carve out a particular niche for the research presented (see 28-29). The arguer role is present both in the *Establishing the niche* and for *Occupying the niche* moves. The first person pronoun can be found both in a critical evaluation of the literature in move 2 (as in 36 above) and in the promotion of the author's own work in move 3 (as in 37). Only the writer role appears to be linked to solely to one move and sub-function, i.e. signalling the structure of the article (32-33). These tentative mappings are illustrated in Table 6.

Table 6: *Correspondences between moves and author roles*

Researcher role	Move 1 (situating own research within the literature) Move 2 (carving out a particular niche)
Arguer role	Move 2 (critically evaluating the literature) Move 3 (promoting own research)
Writer role	Move 3 (indicating article structure)

4.3. First person singular and plural in the English and French single-authored articles

For non-native speakers writing single-authored articles in English, and for the language teachers advising them, the decision to use the singular or plural form of the first person pronoun is a challenging one. A substantial number of examples of both the singular and plural forms can be found in the subcorpus of single-authored English article introductions (see Table 7). The question arises as to whether the authors in English are using *I* and *we* interchangeably in relation to the author roles and the CARS moves or whether there is any difference in authorial stance between the choice of singular and plural forms.

Table 7: *First person roles in the English single-authored introductions*

	We	*I*	Total *We + I*
Writer role	17 (27.8%)	28 (55.0%)	45
Researcher role	31 (50.8%)	16 (31.3%)	47
Arguer role	8 (13.2%)	7 (13.7%)	15
Generic *we*	5 (8.2%)	0	5
Total number of occurrences	61	51	112

If we consider only the use of *I* in the English SA introduction corpus it is clearly the writer role that predominates (55% of occurrences). While bearing in mind that the small size of our dataset does not allow us to make generalisations about language use in this genre (Aston 2001: 75-76), it is tempting to suggest that the use of *I* in English article introductions indicates that the role of writer rather than that of researcher is predominant. The use of *we* in the SA introductions reflects however the pattern observed in the whole set of SA and CA introductions in English, with the researcher role predominating, followed by the writer role and then that of arguer.

Table 8: *First person roles in the French single-authored introductions*

	Nous	*Je*	Total *Nous + Je*
Writer role	36 (29.8%)	1 (50%)	37
Researcher role	62 (51.2%)	1 (50%)	63
Arguer role	23 (19%)		23
Total number of occurrences	121	2	123

As a comparison of Tables 7 and 8 shows, there is a very marked difference in the number of occurrences of the first person singular in the French and English introductions, with 51 in English and only 2 in French, both in the same article introduction. For those familiar with conventions in research articles in French, even the presence of these two occurrences may be surprising. As Didriksen and Gjesdal (2006: 48) point out, the frequency of the first person singular in the whole French KIAP corpus is low. They note that it is "a linguistic feature that is heavily regulated in French academic discourse", citing a reference in *Le Bon Usage* (Grevisse & Gosse 2004: 962) to Loffler-Laurian's (1980) finding that "texts in the exact sciences systematically avoid the pronoun *je*.[5]

The two occurrences of *je* in one of the French introductions are listed below.

> (38) Dans cet article, *je vais essayer de mieux saisir* la spécificité des problèmes posés
> [In this article, I will try to describe in more detail the specific nature of the problems raised]

(39) Pour répondre à cette question, *je propose* un modèle dans lequel les salariés deviennent plus productifs en acquérant de l'ancienneté,
[To answer this question, I propose a model in which salaried employees become more productive in relation to their length of service]

The metatextual expression in the first example (*Dans cet article*) suggests that it can be classified in the category of writer role. In the second occurrence, the researcher role is dominant. With only two examples, both occurring in one introduction out of 50, however, the implication for non-native speakers is clearly that the use of the first person singular should be avoided.

The plural pronoun *nous* in the French SA introductions is otherwise used in very similar proportions to what was observed over the entire introduction corpus. The researcher role once again clearly predominates, followed by that of the writer and arguer roles in second and third place respectively.

5. Pedagogical applications

We have seen how small specially selected corpora make it possible to combine qualitative and quantitative approaches to the analysis of language use in specialised domains. The study of lexico-grammatical patterns and concordance lines in themselves, however, does not provide a coherent teaching programme (Chambers 2010; Charles 2007; Flowerdew 2002, 2008). This also applies even when they are related to higher level discourse concerns. For the analysis above to be made relevant to the needs of learners and to enhance the learning environment, a number of questions need to be addressed. Firstly, what can the teacher learn from the corpus data? Secondly, how can the data be integrated into the learning environment? The substantial body of research on corpora and language learning which has developed since the 1980s leads to the conclusion that, while learners appreciate the access to attested examples of language in use, the encounter with corpus data also presents them with a number of obstacles. In particular, they find the analysis of large numbers of examples time-consuming, laborious and tedious (Chambers 2005: 120; Cheng et al. 2003: 182-3; Yoon and Hirvela 2004: 274). Both Reppen (2010) and Bennett (2010) suggest that teachers and learners may benefit from others' analyses of corpus data rather than doing the calculations themselves. The challenge for the teacher is thus to integrate the research findings from corpus analysis into the learning and teaching environment while minimising or ideally eliminating the obstacles experienced by learners in earlier initiatives. In this way corpus data can become a central feature of

language learning and teaching, rather than being invisible to the learner, as is possible in a corpus-informed approach.[6]

The first question which arises concerns the benefit of corpus consultation by teachers themselves. It has been argued (Johns 1986; Sinclair 2004; Tsui 2004) that teachers can benefit from access to examples of language in use, rather than the invented examples traditionally found in course books. It is important to note that, in the area of LSP, corpus data often have a much more important role to play than in general language teaching contexts, since in the great majority of cases the teacher will not have the relevant specialist experience on which to draw. Indeed, s/he is likely to have no or little experience of language use in the area of specialism of the learners. Even native-speaker intuition is of very limited use. Johns (1986: 159), for example, a native speaker of English but not a specialist in the scientific and technical contexts in which he taught English, used the concordancer as a research tool in his role as teacher:

> It is important that teachers themselves should have experience in using concordance output if they expect their students to make use of it. In my own case, examining output has often proved chastening: for example a concordance of 'if' showed how often in scientific and technical texts it is followed by the bare adjective or past participle e.g. 'if available', 'if known' – a usage I found I had neglected in my materials on conditional constructions in English.

Access to a corpus such as the KIAP corpus would thus enable, for example, a teacher whose students were specialising in economics to base classes not just on individual texts but on a substantial number of additional examples taken from the corpus data. Johns created his own corpora for use by himself and his learners, and the existence of online journals makes it possible for most teachers to build their own similarly specific corpora, although in an ideal environment a variety of specialised corpora would be available, thus making research studies replicable and their findings easy to apply in the classroom.[7]

In the simpler application of corpus data in language teaching, the teacher prepares concordance printouts in advance as worksheets. This practice was given prominence by Johns ([1990] 1991), who coined the term "data-driven learning" (DDL).[8] Thus a teacher who wished to encourage learners to reflect on the different author roles in introductions could begin by asking them to discuss the author roles in the individual text or texts being studied in the class, such as those in Appendix A and Appendix B, and then provide a number of examples from the corpora of introductions. These could focus on one language only, or could involve a comparison of use in the two languages, such as the differences in use of the first person singular and plural, or the identification of author roles. A significant number of examples could be copied on one A4 page per language, allowing the learners the

opportunity to analyse them and inductively decide what roles are involved (see Appendix C for an example based on author roles). As virtual learning environments become more commonly used in language learning at university level, the teacher could provide a greater number of examples from the corpus for the learners to consult in their own time. Although this use of corpora only gives the learners access to a limited amount of data selected by the teacher, it has the advantage that it can be used by any language teacher with an adequate level of corpus consultation skills and access to a concordancer and suitable corpora. In other words, it does not depend on an environment where time and resources are available to provide the learners with the necessary resources and train them in corpus consultation.

While the link between the individual text, the corpus data and author roles in research article introductions is a feature of this particular study, this type of indirect access to corpus data has been the focus of a number of studies since Johns introduced the concept of data-driven learning. Willis (1998), for example, recommended using printed concordance lines as language learning materials. For Boulton (2010), paper-based DDL makes an important contribution to language teaching materials. For a variety of reasons such as access to computers or lack of time and expertise, some teachers may not go beyond this stage. Johns (1997: 113) and Gaskell and Cobb (2004: 307) consider this indirect consultation as a necessary first step, preparing learners for direct access to the corpus and concordancing software in the future. Gabrielatos (2005: n.p.) uses the terms "soft" and "hard" respectively to what are here referred to as indirect and direct consultation of corpus data.

It is difficult to see how indirect consultation could be used to study the relationship between the various author roles and their higher-level discourse functions within the CARS model, as easy access to the complete text of introductions is obviously necessary here. Direct consultation, where the learners themselves consult the corpus using concordancing software, clearly requires more resources (a computer laboratory with concordancing software) and, more importantly, time in the schedule to devote to training in corpus consultation skills. Thus a class based on one or both of the texts in the appendix to this chapter and enhanced by corpus-based study could only include direct corpus consultation by the learners if this were part of the broader language learning environment. The potential for a constructivist approach to learning and for the development of learner autonomy is clearly much greater here (O'Sullivan 2007), as the learners can decide for themselves what aspects of academic writing to investigate. However, as the analysis above has shown, the study of author roles in economics article introductions is not simple. While Aston (1997: 55) underlines the advantages of using small corpora, as they are easy to manage and to become familiar with, it is also important to note that a small corpus of one genre can be very heavily patterned and produce a large number of

occurrences for a learner to analyse. In this case, as we have seen, despite the small size of the subcorpora, the number of occurrences of first person pronouns is substantial, and the learners run the risk of encountering the obstacles which learners in earlier studies have experienced, namely finding the analysis time-consuming, laborious and tedious. The role of the teacher as mediator thus becomes crucial if the learners are to succeed in consulting corpus data in the context of discourse. As Johns (1991: 31) puts it, the teacher is effectively "abandoning the role of expert and taking on that of research organiser". The challenge for the teacher in this case is thus to strike the right balance between ensuring, on the one hand, that the learners have adequate time to become proficient in the analysis of corpus data and the use of the concordancing software, and on the other that they are given guidance on how to make use of the information on author roles and the use of the first person and verbs provided by the teacher to creatively inform their own choices in writing.

A number of researchers, such as Kennedy and Miceli (2001), have devoted attention to the changing role of the teacher, noting how it changes to that of facilitator, advising the learners on how best to search the corpus and analyse their search results. They propose a four-stage strategy which learners can adopt when searching a corpus, namely to formulate the question, devise a search strategy, observe the examples and select relevant ones, and draw conclusions (2001: 82). They also provide tips on how best to benefit from the activity. A learner wishing to study the use of metatextual references with *we* or *nous*, for example, could thus scan the concordances of the pronoun to identify the metatextual references, omit the concordance lines where there are none, and then study the remaining lines, in effect creating language learning materials based on attested language use in a specialised context specifically tailored to this learner's specific needs. To study how authorial roles relate to the CARS model, they could search for the verb they intended to use in their own writing, and see how the authors in the corpus used it in their introductions. As Table 3 shows, learners will encounter a small number of occurrences of the verbs in question, so the consultation of the data will not be unduly demanding. Thus, with a little practice, a learner working in an environment where corpus consultation is encouraged, could use simple corpus searches to see if the native speaker authors use author roles in a similar way to the roles they intend to adopt in their writing. Empirical studies are, of course, necessary to investigate how this will work in practice with different learner groups. For a more detailed study of the changing role of the teacher in a DDL environment, see Boulton (2009: 91-94)

6. Conclusion

In this chapter we have shown how qualitative and quantitative approaches can be profitably combined to provide students with a fuller picture of first person pronoun use in economics article introductions. The initial emphasis on higher level discourse features, through the rhetorical analysis of one article introduction in each language, enabled us to pinpoint the potential functions of first person pronouns within a typical CARS-type introduction. This emphasis was important in providing a framework for subsequent concordance-based analyses. However, as the corpus analysis of authorial roles revealed, the variety of roles played by first person pronouns was far greater than the focus on one single introduction might have led us to believe. Either approach alone, we would contend, is limiting by itself and it is by combining the two that useful teaching applications can be developed. The contrastive approach adopted has moreover enabled us to focus on certain specificities of first person pronoun use in each language. The very different recourse to the first person singular pronoun by the two language groups, for example, is striking, and the analysis of the concordance lines in the English introductions can provide NS French writers with useful data on a feature that appears to be barely used in economics article introductions in their native language.

While the analysis of the uses of pronouns and verbs in economics RA introductions shows the usefulness of a small corpus in the LSP environment, the section on pedagogical applications reveals that there is still ample scope for development in the area of making corpora available to learners and integrating them into the language learning environment in specialised contexts. Inspired by Fligelstone's (1993: 101) scenario, according to which a teacher can advise learners to "go to any of the labs, hit the icon which says 'corpus' and follow the instructions on the screen", Chambers and Wynne (2008) propose a framework for developing corpora available online for the main areas of specialisation covered in language degree programmes. It would be feasible to extend this to other major areas outside the Humanities. Currently available corpora such as KIAP could be used for empirical studies in a number of disciplines to investigate how learners in a constructivist learning environment can benefit from the very substantial amount of research in academic writing in order to reflect on and improve their own writing skills through corpus consultation. More particularly, as we suggest in this chapter, the contribution of corpus data need not be confined to the acquisition of lexis, grammar, or the use of formulaic expressions, but can be extended to the domain of discourse. The development of such research, already set out by Charles (2007), would add a new dimension to the substantial body of publications in the area of corpora and language learning from the 1980s onwards.

Notes

1 The KIAP project (2002-2006), led by Professor Kjersti Fløttum, University of Bergen, was a corpus-based project entitled Cultural Identity in Academic Prose: www.uib.no/kiap [accessed 15/12/10]. The aim of the project was to analyse the relative weighting of disciplinary and linguistic variables in research article writing. Three disciplines are covered: economics, medicine and linguistics and three languages: English, French and Norwegian.

2 A fourth more minor role, namely that of the author as evaluator, manifested by evaluation verbs such as *feel, be struck by*, is also mentioned in Fløttum et al. (2006: 83). However this role is not taken up in Dahl (2009) and the rare examples found in this dataset have been included with those of position verbs.

3 The articles were extracted from the following journals: *European Economic Review*, *Journal of Economic Behavior & Organization*, *Journal of International Economics*, *Annales d'Économie et de Statistique*, *Économie Appliquée*, *Revue Économique*.

4 The wordcounts for the introductions have been calculated using Wordsmith Tools Version 4 (Scott 2004), setting the apostrophe and hyphen as word separators for the French subset. For the English subset the hyphen has been set as a word separator and the apostrophe as a character. This is to allow for the common use of the apostrophe in English to mark the genitive case. The total RA wordcount is as recorded in Fløttum et al. (2006: 7).

5 All translations from French are by the authors.

6 For a detailed analysis of studies of corpora in language learning, see Boulton, this volume.

7 The KIAP corpus is available on demand by contacting the research team through the corpus website at http://kiap.uib.no/index-e.htm, accessed 15/12/10.

8 As Boulton (this volume) points out, publications on the use of corpus data can be found as early as 1980 (McKay 1980). Indeed, the earliest attested use of corpus data in teaching can be traced back to 1969 (McEnery and Wilson, 1997: 12).

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Appendix A. French model introduction

Lehmann, E. 1999. L'impact de l'assurance chômage et de l'assistance chômage sur le chômage d'équilibre. *Annales d'Économie et de Statistique* 53: 31-41.

Le but de cet article est d'étudier les effets des allocations chômage sur le taux de chômage d'équilibre. Les enseignements de la plupart des modèles théoriques convergent pour affirmer qu'une hausse des allocations chômage entraîne une aggravation du chômage (voir par exemple LAYARD et alii [1991], MANNING [1993], CAHUC et ZYLBERBERG [1996], PISSARIDES [1990]). Le mécanisme économique sous-jacent à cette relation a été énoncé par Jacques Rueff dès 1931. Une hausse des allocations chômage rend les travailleurs et les chômeurs plus exigeants, ce qui augmente les salaires réels, diminue la demande de travail des entreprises et aggrave le chômage. Pourtant, ATKINSON et MICKELWRIGHT [1991] ont souligné qu'il est important de prendre en considération la diversité des dispositifs d'indemnisation du chômage ainsi que leur plus ou moins grande dépendance vis-à-vis de la trajectoire antérieure sur le marché du travail du chômeur. Ces auteurs proposent en particulier de distinguer un régime d'assurance chômage et un régime d'assistance chômage. Le premier régime verse typiquement une allocation généreuse, indexée sur une moyenne des derniers salaires reçus pour une durée limitée. Le régime d'assistance verse au contraire une allocation forfaitaire et relativement faible pour une durée illimitée. Dans le système français, l'Allocation Unique Dégressive joue le rôle d'assurance chômage tandis que l'Allocation de Solidarité Spécifique et le R.M.I. présentent toutes les caractéristiques de l'assistance chômage.

En opérant cette distinction dans le cadre d'un modèle de salaire d'efficience, ATKINSON [1995] montre que lorsque les travailleurs licenciés pour faute perdent leur droit à l'assurance chômage, une hausse de l'allocation assurancielle peut diminuer le taux de chômage. En effet, cette hausse accroît ceteris paribus la pénalité que subit un travailleur qui tire au flanc lorsqu'il est détecté. Le but du présent article est d'adopter une démarche similaire pour le modèle WS-PS développé par CAHUC et ZYLBERBERG [1999] (désormais référencé CZ) afin de mieux comprendre comment, dans le cadre de ce modèle, le système d'indemnisation du chômage affecte le taux de chômage de long terme.

Par rapport à CZ, nous supposons l'existence de deux régimes distincts d'allocations chômage. Lors de son entrée au chômage, un travailleur touche pendant une période une allocation assurancielle partiellement indexée sur le dernier salaire qu'il a reçu. S'il ne trouve pas d'emploi à l'issue de sa première période de chômage, il devient un chômeur de longue durée et reçoit l'allocation d'assistance qui est forfaitaire. Enfin, notre modèle se différencie de CZ par la définition du point de menace des syndicats. En cas de rupture des négociations, nous supposons que le contrat de travail des insiders n'est pas rompu indéfiniment, mais qu'il fait seulement l'objet d'une suspension temporaire pendant la période courante, suspension qui correspond à une grève. Nous montrons alors que le taux de chômage est d'autant plus élevé que l'allocation assurancielle est fortement indexée sur le dernier salaire reçu. D'autre part, si la générosité de l'assistance chômage augmente, le taux de chômage d'équilibre reste inchangé. Enfin, les conséquences sur le taux de chômage d'une hausse du ratio de remplacement assuranciel dépend du degré de concavité de la fonction d'utilité instantanée des agents.

Le plan de l'article est le suivant : dans la section suivante, nous présentons la structure du modèle. La deuxième partie est consacrée à la résolution du modèle tandis que la troisième partie expose les principaux résultats de l'article.

Appendix B. English model introduction

Besley, T. & Burgess, R. 2001. Political agency, government responsiveness and the role of the media. *European Economic Review* 45(4-6): 629-640.

Understanding the mechanisms by which citizens' needs are reflected in policy is a key issue in political economy. This is particularly pertinent for populations that live in poverty and depend on the government to protect them from shocks. Indeed, the need for a responsive government is a key message of the World Bank's latest World Development Report (World Bank, 2000) on poverty reduction.

Outside of the world of perfectly benevolent governments a range of institutions - economic, social, political - affect the incentives of governments to respond to citizens' needs. Standard reasoning suggests that responsiveness will typically depend upon the size of the group that is affected - a large group, having greater political power, is more likely to get the government's attention. However, studying the political agency problem in more detail suggests other factors that are likely to be important for government activism. First, voters have to participate in the political process in order to be capable of punishing poorly performing incumbents. Second, voters have to have the information about performance to assess the quality of their incumbents' performance. Mass media can play a critical role here by informing voters about the actions of incumbents which they might otherwise be unaware of.

In this paper, we lay out an example of a political agency model with a role for media in enhancing government responsiveness. We then use data for the period 1958-1992 on the extent to which Indian state governments responded to food shortages via the public distribution of food and correlate these responsiveness measures with various state characteristics. We find that states with greater newspaper circulation, literacy and electoral turnout are also those that have the most responsive governments. In contrast, richer states do not tend to be more responsive than poorer states.

Appendix C. Studying author roles using a concordance

Study the concordance lines below and try to decide which author roles are involved: researcher, writer or arguer. N.B. There can be a certain amount of overlap between these roles at times.

1. The basic analytical framework we adopt is an extension of Turnovsky's (1993) model
2. Specifically we argue that, in the absence of an external enforcement mechanism, international agreements are only viable if member countries view continued cooperation to be in their own self-interest.
3. In Section 2.2, we describe how the model can be used to analyze the emergence of overlapping networks
4. In contrast, I consider a richer business cycle model that is solved numerically
5. In contrast to these VAR analyses, we follow Hartley and Walsh (1992) and use a method of moments procedure
6. In this paper, we lay out an example of a political agency model with a role for media in enhancing government responsiveness
7. We also use the work of Engel and Hakkio (1996) as the basis for a nonparametric test for outliers and we extend the sample to several EMS member countries
8. I have argued in Leamer (1995) that it would be better to call this the 'Factor Price Insensitivity Theorem,'
9. I indicate briefly how identified quantities may be estimated from finite-sample data.

1. Nous fondons notre analyse sur une enquête prospective de type Delphi
2. Dans un premier temps, nous présentons la réglementation du chômage en France de 1986 à 1996
3. Nous supposons d'abord que la redistribution nationale est rendue impossible par la formation d'une fédération
4. Nous étudions les propriétés de détermination locale de l'équilibre dans une économie
5. Nous soutenons in fine qu'il est possible de concilier efficacité et équité
6. Nous décrivons ces différentes études dans la deuxième partie de notre article
7. Nous pensons que ces différents résultats peuvent avoir une certaine pertinence
8. Nous montrons que ce changement structurel de la politique économique conduit à augmenter progressivement, mais lentement, le taux d'actualisation des projets publics.
9. Nous abordons cette question dans la section 4.1 de cet article,