



## **Discours**

Revue de linguistique, psycholinguistique et informatique. A journal of linguistics, psycholinguistics and computational linguistics

**12 | 2013**

**Varia**

---

# The Influence of Genre Constraints on Author Representation in Medical Research Articles. The French Indefinite Pronoun *On* in IMRAD Research Articles

Anje Müller Gjesdal

---



### **Electronic version**

URL: <http://journals.openedition.org/discours/8770>

DOI: 10.4000/discours.8770

ISSN: 1963-1723

### **Publisher:**

Laboratoire LATTICE, Presses universitaires de Caen

### **Electronic reference**

Anje Müller Gjesdal, « The Influence of Genre Constraints on Author Representation in Medical Research Articles. The French Indefinite Pronoun *On* in IMRAD Research Articles », *Discours* [Online], 12 | 2013, Online since 10 July 2013, connection on 19 April 2019. URL : <http://journals.openedition.org/discours/8770> ; DOI : 10.4000/discours.8770

---



*Discours* est mis à disposition selon les termes de la licence Creative Commons Attribution - Pas d'Utilisation Commerciale - Pas de Modification 4.0 International.





Revue de linguistique, psycholinguistique et informatique

<http://discours.revues.org/>

## **The Influence of Genre Constraints on Author Representation in Medical Research Articles. The French Indefinite Pronoun *On* in IMRAD Research Articles**

---

Anje Müller Gjesdal

University of Bergen

.....  
Anje Müller Gjesdal, «The Influence of Genre Constraints on Author Representation in Medical Research Articles. The French Indefinite Pronoun *On* in IMRAD Research Articles», *Discours* [En ligne], 12 | 2013, mis en ligne le 10 juillet 2013.

.....  
URL : <http://discours.revues.org/8770>

.....  
Titre du numéro : *Varia*

Coordination : Saveria Colonna et Sarah Schimke

**revues.org**  
CENTRE POUR L'ÉDITION ÉLECTRONIQUE OUVERTE  
CENTRE FOR OPEN ELECTRONIC PUBLISHING





# The Influence of Genre Constraints on Author Representation in Medical Research Articles. The French Indefinite Pronoun *On* in IMRAD Research Articles

---

Anje Müller Gjesdal

University of Bergen

.....

Scientific discourse is characterized by highly normative and strict genre constraints on language use, both on the macro (text) and micro (word) level. The purpose of this article is to study the distribution of the French indefinite pronoun *on* and its interpretative values across the sections of French-language medical articles (KIAP corpus) in the IMRAD format (Introduction, Methods, Results and Discussion). The main hypothesis is that the IMRAD structure entails a specific distribution of macro level textual structures (author roles, argumentation, rhetorical functions), and that this is reflected in the distribution of micro level linguistic markers, such as the pronoun *on*. Previous studies based on a more limited material (Gjesdal, 2008) indicate that the variation in the interpretative values of *on* seems to be influenced by the IMRAD format, and, furthermore, that the different values seem to correspond to different author roles. Particular emphasis will be put on the influence of the linear sequencing of text imposed by the IMRAD format and the distribution of author roles and speech acts across the text.

**Keywords:** genre, IMRAD, pronouns, *on*, scientific discourse

.....

*Le discours scientifique se caractérise par des contraintes rigoureuses sur la production linguistique au niveau micro-linguistique (mot) aussi bien qu'au niveau macro-linguistique (texte). Cet article a pour objectif d'étudier la distribution du pronom on et ses valeurs interprétatives à travers les sections d'articles médicaux sous le format IMRAD (Introduction, Methods, Results and Discussion) dans un corpus d'articles médicaux (le corpus KIAP). L'hypothèse principale est que la structure IMRAD impose une distribution spécifique de structures textuelles (rôles d'auteur, argumentation, fonctions rhétoriques) qui sera à son tour reflétée dans la distribution des marqueurs micro-linguistiques comme le pronom on.*

**Mots clés:** genre, IMRAD, pronoms, *on*, discours scientifique

## 1. Introduction

- 1 Scientific discourse is a field of highly normative genres, imposing strong constraints on individual writing style (Bazerman, 1988; Swales, 1990 and 2004; Bhatia, 1993). Genre constraints are frequently formalised through journal style sheets that need to be applied in order to achieve publication. The main topic of this article is the influence of one such formatting model, the IMRAD structure, on the use of personal pronouns representing the author, and more specifically the French polysemous pronoun *on*. I will argue that the IMRAD structure governs the distribution of *on* across the text, as well as the appropriate interpretative values in a given section. In this sense, the influence of IMRAD on pronominal use is an empirical example of the larger question of genre constraints in scientific discourse.

- 2 The IMRAD format (Introduction, Methods, Results and Discussion) is a text structure that provides rules for the textual organization of research articles, and is widely used and largely obligatory in many disciplines, particularly in medicine and the natural sciences. IMRAD is a rigid schema for text production and IMRAD research articles are subject to strong and explicit genre constraints. On the textual surface level, the genre constraints can be observed in a linear sequencing of the text, as the format determines a fixed number of sections as well as the order of their sequencing. However, I will argue that IMRAD also imposes constraints on the deeper text level, through the ordering of the distribution of informational content and argumentation across the text, specific themes and functions such as presentation of methodology and results being assigned to certain sections, while argumentation and conclusions are assigned to others.
- 3 It is likely that the constraints of the IMRAD format also affect the textual representation of different textual voices, and particularly the voice of the author. Rastier (2005), Fløttum et al. (2006) and Poudat (2006) have shown that different author roles can be assigned to different sections of a scientific text, and argue that this is in fact an important feature of scientific genres. In this paper, I will argue that different author roles, corresponding to different “speech acts” can be observed by way of micro-level linguistic features, such as personal pronouns, expressions of epistemic modality and verb tense. To demonstrate this, I will examine the use of the French indefinite pronoun *on* in medical research articles. The indefinite pronoun *on*, corresponding to the English *one*, can be used to express a range of meanings, referring to the speaker, to the speaker-hearer couple, to individuals external to the communicative situation, or indefinite use. Fløttum et al. (2006) have observed that the semantic flexibility of the pronoun *on* is used for a variety of purposes in the genre of the research article, referring to the article author him-/herself, to the reader but also to other researchers and the scientific community at large.
- 4 The material analyzed is taken from a subcorpus of medical research articles in the KIAP (*Kulturell identitet i akademisk prosa / Cultural identity in scientific discourse*) corpus (see <http://kiap.uib.no/KIAPCorpus.htm>; for a further description of the corpus, see Fløttum et al., 2006). The KIAP corpus was established by Professor Kjersti Fløttum at the Department of Foreign Languages at the University of Bergen (Fløttum et al., 2006) and the main objective of the project was to investigate the influence of variables such as discipline and language on scientific discourse. The corpus consists of 450 research articles from three languages (English, French, Norwegian) and three disciplines (medicine, economy and linguistics). The articles were taken from established and respected journals in their field, from both France and Quebec. This article studies the subcorpus of French medical articles, for practical reasons known as *fmed*, consisting of 50 articles<sup>1</sup>.

---

1. The articles in the subcorpus *fmed* are taken from the following journals: *Annales de médecine interne*, *Bulletin de la Société belge d'ophtalmologie*, *Maladies chroniques au Canada*. The journals were selected on

- 5 The article is structured as follows: Section 2 presents the IMRAD model, Section 3 discusses the notion of author roles in research articles, while Section 4 describes the use of the pronoun *on* in research articles. Section 5 presents the results of the corpus analyses, while Section 6 sums up the results of the article.

## 2. The IMRAD model

- 6 The IMRAD structure is a textual format for research articles that was introduced in the 1940s and originated in the health sciences. By the 1980s it was used in all research articles in the major medical research journals (Sollaci & Pereira, 2004), and it has now become predominant in many disciplines, not only in the natural sciences.

- 7 The IMRAD structure divides the research article into sections that perform different tasks in the text<sup>2</sup>. The *Introduction* section contains a presentation of the object of study and methodology, as well as a literature review situating it within the research field (Adams Smith, 1984: 28-29). In terms of rhetorical moves, the *Introduction* section is characterized by the introduction of background information, reviewing of related research and presenting new research (Nwogu, 1997: 126).

- 8 The *Methods* section presents the data used in the study (Adams Smith, 1984: 30) and is characterized by the following moves: describing the data collection procedure, describing the experimental procedure and describing the data-analysis procedure (Nwogu, 1997: 125).

- 9 The *Results* section lays out the article's results, and is characterized by two rhetorical moves: indicating consistent observations and indicating non-consistent observations (Nwogu, 1997: 125).

- 10 The *Discussion* section contains a discussion of results and methods and explains the data (Adams Smith, 1984: 30), the situation of the findings with respect to other studies in the field, and possibly a conclusion and implications for future work. In terms of rhetorical moves the section is characterized by the highlighting of the overall research outcome, explanations of specific research outcomes as well as statements of research conclusions (Nwogu, 1997: 125). Consistent with this, Heslot (1980) observed that the *Discussion* section typically serves to confront the author's results with previous findings.

---

the basis of recommendations from experts in the discipline (see Fløttum et al., 2006: 8, for a description of the text selection criteria).

2. The distribution of rhetorical functions and information across the IMRAD structure has been conceptualised in various ways in the literature. Biber and Finegan (1994) argue that the IMRAD sections correspond to textual *micro-purposes*, meaning that each section carries out a specific task within the framework of the text, while Nwogu (1997: 120) provides an account of "the schematic structure of information in the medical research paper [...]" focussing on the distribution of so-called *moves* across the sections of texts in the IMRAD format. Breivega (2003) argues that IMRAD imposes constraints on the kind of speech acts that are acceptable at different points in the text; *Methods* and *Results* sections are for *describing*, while *evaluating*, *arguing* and *concluding* may be done in the *Introduction* and *Discussion* sections.

- 11 In addition to text level functions such as information distribution and rhetorical moves, several micro-linguistic features have been observed to be characteristic of the different sections of the IMRAD structure, as is illustrated by Table 1.

	Introduction	Methods	Results	Discussion
Personal pronouns	third person singular, second person plural	“they”	“they”, absence of the first person singular pronoun	first person singular (“I”)
Verb tense	present tense	past tense	past tense	past tense
Verb semantics	“report”	“receive”, “take”, “ask”, “do”	“show”	“report”
Argumentative connectives	“however”, “therefore”			“thus”, “since”
Modal markers				modal auxiliaries ( <i>could, may, will</i> , etc.)

Table 1. Micro-linguistic features of the IMRAD structure  
(based on Heslot, 1980; Swales, 1990; Nwogu, 1997; Fraser, 2002)

- 12 On the macro-linguistic level of the text as well as the micro-linguistic word-level, IMRAD is a format of *standardisation*, not only of the surface structures of the text, but also of the way argumentation and the author’s voice are expressed. In other words, the linear structuring of the text in sections imposed by the IMRAD format corresponds to a linear distribution of rhetorical functions across the research article. Thus, the surface level organization of the IMRAD structure corresponds to a deep level organization of the rhetorical and argumentative functions, and in this sense IMRAD can be said to have wide-ranging implications for scientific discourse. As Pontille (2007: 230) has pointed out the IMRAD structure has a wider significance than mere text formatting:

En servant de points d’appui communs aux auteurs et aux lecteurs, le format IMRAD standardise les procédures d’évaluation et matérialise un lien social et cognitif au sein des pratiques discursives d’un groupe professionnel<sup>3</sup>.

- 13 On the basis of this observation, I will now go on to examine how the IMRAD format structures aspects of author manifestation in research articles. More

3. “As a shared support for authors and readers, the IMRAD structure standardises evaluation procedures and materializes a social and cognitive bond within the discursive practices of a professional group” (my translation).



specifically, I will examine the interaction between the IMRAD format and a specific rhetorical structure, i.e. the textual representation or manifestation of the author in and through *author roles* (Rastier, 2005 and 2011; Fløttum et al., 2006). Furthermore, I will examine how the properties of the IMRAD format may influence the distribution of micro-linguistic features that are central to the representation of author roles across the text, exemplified by the distribution of the French pronoun *on* across the IMRAD structure.

### 3. The rhetoric of scientific discourse: author roles

14 In this article I argue that author manifestation can be analyzed as large-scale textual structures, induced by the repetition and interaction of micro-linguistic features that are reflective of personhood, as well as the regular recurrence of a certain informational and argumentative content. Moreover, the unfolding and distribution of the textual representation of the author is structured and governed by the IMRAD format.

15 Fløttum et al. (2006: 81) propose the notion of *author roles* to describe regularities in the textual representation of the author of research articles. They distinguish four author roles that can be observed on the basis of linguistic clues, such as verb forms and verb semantics, modal markers and personal pronouns. The roles they ascribe to the textual representation of the author are the *writer role*, the *researcher role*, the *arguer role* and the *evaluator role* corresponding to different modes of textual representation of the author.

16 The writer role is typically associated with discourse verbs, as in the following examples<sup>4</sup>:

[1] In Sections 3.1, 3.2 and 3.3, I *describe* each of the possible perspectives [...].  
(engling34)

[2] I shall *return* to this sequence later, [...].  
(engling20)

17 The researcher role is characterized by the presence of research verbs in the immediate co-text, demonstrated in the following examples:

[3] As before, I *calculate* welfare gains [...].  
(engecono6)

[4] [...] I *assume* that this position is Spec, VP [...].  
(engling01)

4. The examples are taken from Fløttum et al. (2006: 87–88). See Carter–Thomas and Chambers (2012: 28–29) for another overview of the interaction of author roles and verb semantics.

[5] I *conducted* these interviews in Spanish.  
(engmedo4)

18 The arguer role is characterized by so-called position verbs, like *argue*, *claim*, and *believe*:

[6] Yet, I *argue* that these on-line studies only examine the immediate activation of individual word meaning [...].  
(engling22)

19 Finally, the evaluator role is associated with verb constructions whose semantic content signals emotional or evaluative content, as in the following examples:

[7] [...], I *have been struck by* the practical differences that separate present-day econometrics and experimental economics, [...].  
(engecon30)

[8] But I *am sceptical about* extending iconicity to distance phenomena.  
(englingo3)

#### 4. The French pronoun *on* in scientific discourse

20 Previous research has indicated a range of linguistic markers relevant for the representation of the author voice in the research article (Fløttum et al., 2006). In this article I will examine the use of the French indefinite pronoun *on*, to see how and if its use and interpretation varies across the IMRAD structure. While the basic semantic content of *on* is traditionally taken to correspond to the English impersonal or generic pronoun “one”, *on* has in fact come to have a much wider and more flexible referential potential in present-day French than its English counterpart. *On* can be used to express a range of meanings, but is today largely used to refer to a collective including the speaker him-/herself, corresponding to the English “we”.

21 The interpretation of *on* is largely contingent on discourse genre and varies greatly between formal and informal registers (Gjesdal, 2008). In the genre of the research article the pronoun *on* makes it possible to negotiate genre constraints that posit the impersonal as an ideal, while at the same time making the author’s voice heard. In a seminal study, Loffler-Laurian (1980) investigated the use of the French pronouns *je*, *nous* and *on* in research articles to analyze their role in author manifestation. According to Loffler-Laurian, pronominal use is a reflection of genre constraints, and allows for negotiating the simultaneous demands of complying with the need for personal presence in order to promote one’s own research and adhering to the impersonal ideal of scientific discourse. She also observes that the use of *on* changes with the textual progression and the topics discussed; when talking about domains of experience *on* has a *personal* value, i.e., referring to the

author and the team of researchers; when talking about theoretical matters *on* has a generic, indefinite value. Loffler-Laurian also emphasizes the role of the verbs associated with *on* in identifying the reference of this pronoun, and concludes that the pronouns *on* and *nous* contribute to *masking* the author's voice rather than emphasizing it. This illustrates the influence of genre constraints on pronominal use in research articles, and the way in which pronominal use in research articles differs from everyday language.

#### 4.1. Interpretative values of *on* in the research article

- 22 In a more recent study, Fløttum et al. (2006) observed that the semantic flexibility of the pronoun *on* is used for a variety of purposes in the genre of the research article, referring to the article author him-/herself, to the reader but also to other researchers and the scientific community at large. Accordingly, Fløttum et al. (2006) propose a classification of the different values *on* may take on in research articles (illustrated in Table 2). They distinguish six different values distributed on a continuum of author involvement, ranging from complete identification with the author (ON<sub>1</sub>), to reference to others (ON<sub>6</sub>).

Values of <i>on</i>	Referent(s)	Corresponds to
ON <sub>1</sub>	author(s)	"I"/"we"
ON <sub>2</sub>	author(s) + reader(s)	"I"/"we" + "you" ("I"/"we" + the reader(s))
ON <sub>3</sub>	author(s) + limited discourse community	"I"/"we" + "you" ("I"/"we" + my colleague(s))
ON <sub>4</sub>	author(s) + unlimited discourse community	"I"/"we" + everybody
ON <sub>5</sub>	reader(s)	"you" (the reader(s))
ON <sub>6</sub>	other(s)	"he"/"she"/"they" (other researchers)

Table 2. Interpretative values of *on* in research articles (cf. Fløttum et al., 2006)

#### 4.2. Disambiguation criteria

- 23 In order to make the basis for classifying the interpretative values of *on* in the research article more transparent, I will apply the following disambiguation criteria proposed by Fløttum et al. (2007):

- ON<sub>1</sub> often occurs with metatextual or deictic elements and the verb tenses *futur* and *passé composé*. ON<sub>1</sub> is also characterized by discourse and research verbs. ON<sub>1</sub> is often found in the *Introduction* section;
- ON<sub>2</sub> is characterized by cognitive and perception verbs, the verb tenses *futur* and *passé composé* as well as metatextual elements;

- ON<sub>3</sub> occurs with the verb tense *présent*, modal auxiliaries, especially *pouvoir*, specialized and technical vocabulary and generalising adverbials;
- ON<sub>4</sub> is characterized by the verb tense *présent*, modal auxiliaries, especially *pouvoir*, verbs that are unrelated to the research process and generalising adverbials;
- ON<sub>5</sub> occurs with metatextual elements, the verb tense *futur* and perception verbs;
- ON<sub>6</sub> occurs with bibliographical references that may be more or less explicit and precise.

24 While disambiguation criteria such as these often allow for the identification of the appropriate referent(s) of *on*, it should be noted that they are not always conclusive. In many cases, a clear decision simply cannot be made.

## 5. Analyses: *on* and author roles across the IMRAD structure

25 The main research questions that will be examined are as follows: to what extent is the distribution of *on* and its various interpretative values influenced by the IMRAD structure, and to what extent do the interpretative values correspond to different author roles.

26 The analyses have been carried out in two separate strands. Section 5.1 presents a qualitative case study of the distribution of *on* and its associated author roles across the IMRAD structure in a single article. This section aims to give a close reading of how various micro-linguistic features contribute to the interpretation of *on*, and how this pronoun relates to the notion of author roles. The qualitative analysis is enriched with a quantitative analysis of the distribution of the pronouns *nous* and *on* across the IMRAD structure (relative and absolute frequencies) in Section 5.2, and finally an analysis of the interaction between *on* and verb semantics across the IMRAD structure in the subcorpus *frmed* (Section 5.3). On the basis of the author role model proposed by Fløttum et al. (2006), I examine the hypothesis that the verbs associated with *on* in the different sections of the IMRAD structure may be indicative of various author roles.

27 As Carter-Thomas and Chambers (2012: 19) note, the combination of quantitative and qualitative analyses is in fact dominant in corpus-based research on academic discourses, especially in the analysis of discourse level functions. Carter-Thomas and Chambers (2012: 19) neatly demonstrate this approach through their analysis of the use of author roles and first person pronouns in article introductions in French and English, where a preliminary qualitative analysis of a single article is followed by a quantitative analysis. The results of their study indicate that qualitative and quantitative analyses complement each other and that a combination of the two may generate new insights.

### 5.1. Case study: interpretative values of *on* across the sections of the IMRAD structure

28 In order to examine the interaction of three parameters (IMRAD, *on* and research article author roles) I have selected an article for qualitative analysis. The selected article, *frmed02* (Laurier et al., 1999), exhibits an extensive use of *on* compared to the other articles in the subcorpus, furthermore it seems to display a preference for *on* rather than *nous* for representing the authors' voices, as can be seen from Table 3. Table 3 also indicates a variation across the IMRAD structure, both in the absolute frequency of *on* as well as in the interaction of *on* and *nous*, the other personal pronoun that may refer to the authors themselves in medical research articles<sup>5</sup>.

Introduction		Methods, Materials and Results		Discussion		Conclusion		Total	
Nous	On	Nous	On	Nous	On	Nous	On	Nous	On
1	5	0	12	4	4	0	1	5	22

Table 3. *Nous* and *on* in the article *frmed02* (absolute frequencies)

29 Due to the polysemous nature of *on*, these numbers tell us relatively little as they stand, and a qualitative analysis is needed to deepen the understanding of the findings. What do the figures reflect in terms of the interpretative values of *on*? Since *on* may potentially refer to the author him-/herself, a collective of the author and colleagues, the reader, and even persons exterior to the author-reader couple, the material had to be examined manually in order to assess the distribution of interpretative values across the IMRAD sections. The findings are also evaluated with reference to the characteristics of the IMRAD structure presented in Section 2.

#### 5.1.1. The Introduction section

30 The *Introduction* section is generally reserved for an outline of the research problem and the state of the art of the research field. In terms of pronominal use, it is characterized by the interpretative values ON1 (referring to the Author(s), corresponding to "I/we"), and ON6 (referring to other person(s), corresponding to "he/she/they", other researchers). This is consistent with the findings of Régent (1992: 68) who observes that the personal marks of the author, including the personal pronouns *nous* and *on* are particularly frequent in the *Introduction* and *Discussion* sections.

31 To what extent are the interpretative values of *on* identified in the *Introduction* section connected to and reflective of the micro-purposes or speech acts that

5. There are no occurrences of the first person singular pronoun *je* (or the variant *j'*) in the subcorpus *frmed*, since medical articles are generally collectively-authored.

the literature has established as characteristic of the *Introduction* section of an IMRAD article?

- 32 The occurrences of ON<sub>1</sub> are clustered in the final paragraph of the section, and all refer explicitly to the research process, as in the following example:

[9] **On** a établi les taux d'hospitalisation et la durée moyenne de ces hospitalisations (séjour moyen), puis classées [*sic*] celles de 1994-1995 par âge, par sexe et par mois d'admission. **On** a ensuite estimé le coût des hospitalisations pour l'asthme en 1994-1995.

*We established the rate of hospitalization and the average length of these hospitalizations [...] then classified the hospitalizations of 1994-1995 according to age, sex and month of admittance. We then estimated the cost of hospitalizations for asthma in 1994-1995*<sup>6</sup>.

- 33 The occurrences of ON<sub>1</sub> are associated with contextual elements typical of uses of *on* corresponding to the first person pronouns “I” and “we”. On the level of temporal reference, several textual clues contribute to the identification of the referent; the past tense referring back to research that has already been carried out, and the adverb *ensuite* (“then”) referring to the sequencing of the different stages of the research process. Furthermore, lexical items referring to the research process make it possible to identify the referent of *on* as the person(s) responsible for the research process itself, the research verbs *établir* and *estimer* and several more or less technical terms that describe the research process (*taux, durée moyenne, coût*). In sum, these contextual elements make it reasonable to state that *on* does in fact represent the authorial voice, speaking as the subject that has carried out the research, corresponding to the author role of Researcher in the terms of Fløttum et al. (2006).

- 34 The *Introduction* is also characterized by the interpretative value ON<sub>6</sub>, referring to a third party external to the author-reader couple. In the *Introduction* section there are three occurrences of ON<sub>6</sub>, all referring to other researchers. In all these cases the reference to others is confirmed by textual clues, i.e., co-occurring bibliographical references, as in the following example:

[10] **On** a récemment observé une telle baisse en Suède [références bibliographiques].  
*Such a drop has recently been observed in Sweden [bibliographical references].*

- 35 In this example, not only the references, but also the indication of geographical position – Sweden – indicates that somebody other than the Quebec-based article authors made the observations.

6. All the examples' translations are my own. Although “one” is the literal equivalent of *on* in English, I have chosen to render *on* by pronouns or impersonal constructions that are pragmatically and functionally equivalent in context. The English glosses are not intended to be “natural” translations, but retain the original structure as far as possible.

36 In sum, if we were to range the interpretative values of *on* on a scale of closeness  
to and distance from deictic centre – the *ego* – we see that the *Introduction* section is  
characterized by the most *extreme* interpretative values, ON<sub>I</sub> and ON<sub>6</sub>. Can this be  
explained in terms of the rhetorical constraints imposed by the IMRAD structure?

37 It could be argued that the interpretative values of *on* are linked to the rhetorical  
micro-purposes of the *Introduction* section, which as we have seen are typically  
those of describing one's own project and situating it within the research field  
in relation to other projects/authors. In this perspective, the *Creating A Research  
Space* model, CARS, proposed by Swales (1990: 141) may account for the variation  
in the *Introduction* section. Swales argues that article introductions are typically  
characterized by rhetorical moves that help the author establish him-/herself within  
the research field and argue for the relevance of their research. The different values  
of *on* that were identified in the *Introduction* section may be consistent with this  
strategy. ON<sub>6</sub>, referring to other researchers and previous research situates the  
article in the research field, while ON<sub>I</sub> contributes to the credibility and authority  
of the author's own research.

38 Let us now move on to the second section of the article, *Methods*.

#### 5.1.2. The Methods section

39 The *Methods* section is dominated by the value ON<sub>I</sub> (referring to the authors,  
corresponding to the pronoun *we*), which is hardly surprising since all the occurrences  
appear in contexts describing the research activity that has been carried out. This is  
indicated by technical research vocabulary (e.g., *analyse de variance*) as well as research  
verbs such as *estimer* ("estimate") and *calculer* ("calculate"), as in the following example:

[11] On a effectué une analyse de la variance à deux facteurs pour l'âge et le sexe.  
*We carried out a two-factor analysis of variance for age and sex.*

40 All occurrences of ON<sub>I</sub> in the *Methods* section are associated with the author role  
of Researcher. This result is, of course, to be expected, as the primary function and  
micro-purpose of this section is to lay out the methodology and the data behind the  
analyses and results. It is also consistent with the findings of Loffler-Laurian (1980),  
who observes that *on* used in scientific discourse tends to have a more personal  
value in contexts where concrete research work is described and a more generic or  
indefinite value in contexts referring to theoretical discussions.

41 Let us now move on to the *Results* section.

#### 5.1.3. The Results section

42 The *Results* section is characterized by ON<sub>I</sub> (referring to the authors, corresponding  
to "we") and associated with the author role of Researcher. However, it also contains  
occurrences of *on* that are more ambiguous, and less easily classifiable. To illustrate  
this complexity, let us look at the following example:

- [12] La figure 1 montre que les plus hauts taux d'hospitalisation pour l'asthme en 1994-1995 ont été observés chez les garçons de 0 à 1 an et que le groupe des garçons de 1 à 4 ans affiche aussi un taux élevé. Les garçons de moins de 5 ans sont hospitalisés à peu près deux fois plus souvent que les filles du même âge. **On remarque cependant** la tendance inverse dans les tranches d'âge supérieures à 10 ans, où les taux sont plus élevés chez les sujets de sexe féminin.

*Figure 1 shows that the highest rates of hospitalization for asthma in 1994-1995 were observed in boys from 0 to 1 year [...]. However the opposite tendency is noticed for those older than 10 years [...].*

43 In this example, it seems reasonable to attribute the value ON2 to *on*, referring to the collective of the authors and their readers, but it would also be possible to argue that it is an example of ON4 (authors and “unlimited discourse community”, i.e., the general opinion) or even ON5 (referring to the readers only, corresponding to the pronoun “you”). Crucially, *on* functions as part of a metatextual construction, conveying instructions to the readers on how to interpret the data and the arguments presented, as indicated by from the cognitive verb *remarquer*, which invites the reader to a shared perspective of the text. The argumentative connective *cependant* (“yet”, “however”) orients the processing of the information and provides argumentative clues for the reading.

44 The occurrences of the interpretative ON2 can be read into the didactic style that characterizes the genres of scientific discourse. Rastier (2005: online, Section 5) analyzes scientific discourse as represented narration, and introduces the notion of the *guide* as a textual actor responsible for the didactic orientation of the text, reflected in certain linguistic markers:

Le *Guide* (au sens où l'on parle d'une visite guidée) assume une tâche didactique d'accompagnement du lecteur et utilise des figures de participation. Par exemple, il emploie le *nous* inclusif (“Nous avons vu plus haut...”). Ses actions sont des actions partagées de parcours du texte, d'où la fréquence de verbes de mouvement et de perception (*venir, voir*, etc.). En multipliant ces figures de participation, le style *reader-friendly* aujourd'hui recommandé retrouve certains aspects de l'*accommodatio* rhétorique et confère un ton didactique vaguement convivial à un nombre croissant de textes scientifiques<sup>7</sup>.

45 In this perspective, the polysemy of *on* could be seen as a reflection of the *Guide*, *on* being a less intrusive and perhaps more reader-friendly marker than *vous*/“you”, which could potentially imply a more authoritarian attitude vis-à-vis the readers.

7. “The *Guide* (in the sense that one speaks of a guided visit) performs the didactic task of accompanying the reader and uses figures of participation. For example, he uses the inclusive *we* (“We saw above...”). His actions are shared actions of traversing through the text, hence the frequent use of movement and perception verbs (come, see, etc.). By multiplying these figures of participation, the reader-friendly style that is recommended today reinvents certain aspects of the rhetorical *accommodatio* and confers a didactic, vaguely convivial tone to a growing number of scientific texts” (my translation).



46 Let us now go on to the *Discussion* section.

#### 5.1.4. The Discussion section

47 The *Discussion* section is characterized by the interpretative values ON<sub>1</sub> (referring to the authors themselves), and ON<sub>4</sub> (referring to the authors and an “unlimited” discourse community, corresponding to “I/we” + “everybody” [*tout le monde*]). This is the generic value of *on*, which is in fact considered to be its default value in French. An example of this can be seen in the following example:

- [13] En 1994-1995, **on** a assisté à un retour au taux d’hospitalisation pour l’asthme de 1988-1989 [...].  
*In 1994-1995, there was a return to the levels of hospitalization for asthma of 1988-1989 [...].*

48 In this case, the construction *on a assisté à* is in fact closer to an impersonal expression like *il y a eu* (“there was”) than to a personal pronoun. Rather than reflecting the personal voice of the author, *on* is merely part of a presentational device for referring to a large-scale societal trend observed by the authors.

49 This article is idiosyncratic in the sense that it includes a *Conclusion* section, a section that is not obligatory in the IMRAD structure.

#### 5.1.5. The Conclusion section

50 This section is characterized by ON<sub>1</sub> (referring to the authors), associated with the author role of the Researcher, as in example [14]:

- [14] **On** a constaté une faible diminution du séjour moyen.  
*We noted a slight decrease in the average stay.*

51 In this example, *on* is associated with the cognitive verb *constater*, which indicates participation in the research process, fitting well with the status of the *Conclusion* section as a place for summing up findings and observations. Furthermore, the verb tense, *passé composé*, is a textual clue for the temporal situation of the referent of *on*, as it generally indicates a value close to the deictic centre (i.e., the speaker).

52 In order to enrich and extend the qualitative analysis, I carried out a quantitative analysis of the distribution of *on* and *nous* across the IMRAD structure in the entire subcorpus *frmed*<sup>8</sup>, which will be presented below.

8. Due to the highly complex semantics of *on* as well as the many factors involved in the textual representation of author roles, it was not possible to carry out a full analysis of all occurrences of *on* and *nous* in the subcorpus with reference to author roles within the scope of this article (this would also necessitate the analysis of co-occurring verbs, adverbs and other contextual elements). This would however be an interesting task for future research.

## 5.2. The distribution of the pronouns *nous* and *on* across the IMRAD structure

53 In the KIAP corpus, all articles in the IMRAD format have been coded so that searches can be performed according to the IMRAD sections<sup>9</sup>. On the basis of these searches, I did a simple calculation of the absolute and relative frequencies of the pronouns *nous* (“we”) and *on* in the different sections. The relative frequencies were calculated on the basis of the total number of words in each section. The results (relative and absolute frequencies) are shown in Table 4.

	Introduction (13,800 words)	Methods, Materials and Results (71,760 words)	Discussion (47,888 words)	Conclusion (5,062 words)
NOUS (relative frequency)	0.27	0.18	0.20	0.24
NOUS (absolute frequency)	37	132	95	12
ON (relative frequency)	0.21	0.18	0.15	0.26
ON (absolute frequency)	29	131	71	13

Table 4. Distribution of the pronouns *nous* and *on* across the IMRAD structure in the subcorpus *frmed*

54 As can be seen in Table 4, the distribution of the pronouns *nous* and *on* varies across the sections of the IMRAD structure, which is consistent with previous analyses of the distribution of pronouns in research articles in the IMRAD format (Heslot, 1980; Biber & Finegan, 1994). In the *frmed* subcorpus, both *nous* and *on* are more frequent in the *Introduction* and *Conclusion* sections than in the *Methods*, *Results* and *Discussion* sections. These findings are consistent with the observations in 5.1, where the *Introduction* section was seen to correlate with certain rhetorical moves, such as claiming one’s place in the research field, which requires a strong personal presence, manifested, *inter alia*, by the pronouns *nous* and *on*. Of course, due to the limited size of the corpus and the fact that the absolute frequencies are low, findings should be taken with caution, however the data nevertheless indicate a relation between article section and the frequency of personal pronouns potentially representing the author’s voice.

9. However, there is one discrepancy between the coding of the corpus and the IMRAD structure, as sections pertaining to *Methods*, *Materials* and *Results* have been coded as a single section in the KIAP corpus. For this reason, the quantitative analyses present them as a single section, while they would strictly speaking be in separate sections in the IMRAD structure.

### 5.3. The interaction of *on* and verb types – variation across the IMRAD structure

55 A key linguistic feature associated with the author roles of the research article is verb semantics. As seen in Section 3, the various author roles tend to be associated with certain kinds of verbs, such as discourse verbs in the case of the author as writer. In this section, I will present the results of an analysis of the verbs associated with *on* across the sections of the IMRAD format<sup>10</sup>. The purpose of this analysis is to examine whether any patterns can be discerned in the interaction of *on* and verbs, and whether the verb semantics confirm the findings of the qualitative analysis.

#### 5.3.1. Introduction

56 The *Introduction* section is a comparatively short section of the medical research article, and accordingly presents a limited number of verb types as well as occurrences thereof. The verbs most frequently associated with *on*, *constater* and *estimer* (see Table 5) seem to correspond to an impersonal construction corresponding closely to passive constructions such as “is observed”/“is estimated”:

[15] En France, avec un recul de 3 ans, **on constate** que fin 1998, 57 200 personnes dépendantes aux opiacés suivent un traitement de substitution par la buprénorphine haut dosage (HD) et 7 150 personnes dépendantes aux opiacés sont sous méthadone. (frmed22)

[16] **On estime** qu’en 1997, le cancer du col utérin sera diagnostiqué chez 1 300 Canadiennes et qu’environ 390 d’entre elles en mourront. (frmedo5)

Constater	4
Estimer	4
S’intéresser	2

Table 5. Verb types – *Introduction* (13,800 words)

#### 5.3.2. Methods, Materials and Results

57 Since the *Methods*, *Materials* and *Results* section is the most extensive of the sections, there is greater variation in the occurrence of verb types, and a larger number of occurrences of each verb than in the other sections. Research verbs such as *observer*, *noter* and *estimer* are very frequent (see Table 6), which clearly illustrates that *on* is associated with the author role or the researcher in this section, as illustrated in the following examples:

10. For brevity’s sake, only verbs with two or more occurrences have been included. Modal verbs and periphrastic constructions have also been excluded.

- [17] Dans six cas, **on observe** des valeurs significativement supérieures à la moyenne québécoise: spina bifida au Saguenay-Lac-Saint-Jean et dans la région Terres-Cries-de-la-Baie-James; hydrocéphalie congénitale pour la Côte-Nord; atrésie et sténose du côlon, du rectum et du canal anal dans le Bas-Saint-Laurent; anomalies congénitales de la paroi abdominale en Estrie; et syndrome de Down à Montréal-Centre.  
(frmed01)
- [18] Sur les 12 cas associés à un HLA B 27 +, **on retrouve** un rapport homme/femme de 5 à 7.  
(frmed39)

Observer	24
Noter	11
Retrouver	11
Constater	7
Remarquer	4
Estimer	3
Supposer	3
Avoir	2
Considérer	2
Établir	2
Trouver	2
Être	2

Table 6. Verb types – *Methods, Materials and Results* (71,760 words)

### 5.3.3. Discussion

- 58 The *Discussion* section is clearly characterized by cognitive verbs (see Table 7), i.e., verbs referring to a mental process such as *savoir* and *ignorer*, as in the following examples:

- [19] **On sait** déjà que les héroïnomanes sont susceptibles d'adhérer aux mesures de protection collective, d'hygiène de l'injection, par exemple [références bibliographiques], comme aux contraintes des traitements individuels antirétroviraux ou autres [références bibliographiques].  
(frmed19)
- [20] Peu de données d'enquête ont été recueillies sur l'hystérectomie, et **on ignore** dans quelle mesure ces questions ont fait intervenir un biais lié à l'auto-déclaration.  
(frmed05)

59 Although cognitive verbs are less readily defined as research verbs than verbs such as *observer* that clearly refers to the empirical research process, it seems reasonable to categorize them as research verbs, i.e., as part of the reasoning that is integral to the research process<sup>11</sup>.

Constater	4
Retrouver	4
Observer	3
Savoir	3
Ignorer	2
Décrire	2
Voir	2
Diminuer	2

Table 7. *Discussion* (47,888 words)

#### 5.3.4. Conclusion

60 Since most medical research articles do not include a *Conclusion* section, the results from the subcorpus *frmed* are too limited to warrant speculation (the *Conclusion* section of the subcorpus contains 5,062 words). However, it should be noted that out of 13 occurrences of *on*, 7 are associated with the modal verbs *pouvoir* and *vouloir*. Generally, these constructions seem to be associated with the author role of evaluator, as in the following example:

- [21] Ce positionnement est non seulement lourd de contraintes pour les patients mais aussi pour la famille et **on peut craindre** qu'avec des contraintes élevées, on en arrive à une baisse de compliance et un risque d'échec plus important de la chirurgie.  
(frmed36)

61 However, modal verbs may also be associated with the author role of arguer, as in the following example:

- [22] **On peut faire** l'hypothèse qu'il en est de même des conduites addictives alimentaires et dans d'autres conduites comportementales où les bases et les mécanismes neuro-biologiques sont les mêmes que dans les toxicomanies.  
(frmed13)

11. For a discussion of cognitive verbs as research verbs, see Fløttum et al. (2006: 117).

## 6. Concluding remarks

62 How do genre constraints influence author representation in research articles? This was the main question examined in this article, exemplified by the influence of the IMRAD format on the use of personal pronouns representing the author, and more specifically the French polysemous pronoun *on*.

63 *On*, being a polysemous pronoun, can represent the author's voice, as well as the reader(s) or person(s) external to the author-reader couple. To what extent does the IMRAD structure govern the distribution of *on* across the text, as well as the selection of the appropriate interpretative values in a given section? Moreover, can the variation in pronominal use across the IMRAD structure be linked to a variation in rhetorical functions (such as arguing, presenting research, etc.), that the literature has shown to be specific to certain sections of the IMRAD structure?

64 In this paper, I have presented a set of qualitative and quantitative analyses of a set of French medical research articles taken from the KIAP corpus, in order to account for the variation in the use of the pronoun *on* in medical research articles. In Section 5.1, I presented a qualitative case study of a research article characterized by a frequent use of *on* where I examined the variation in the interpretative values of *on* across the IMRAD structure as well as the pronoun's interaction with various author roles. Following Fløttum et al. (2006) and Rastier (2005 and 2011) I understand author roles as the linguistic representation of various aspects of the author as a textual being (Writer, Researcher, Arguer, Evaluator, Guide). Furthermore, I applied the classification of values of *on* in research articles proposed by Fløttum et al. (2007), who identified 6 values ranging from ON<sub>1</sub> = the researcher(s) to ON<sub>6</sub> = other persons external to the author-reader couple (i.e., other researchers). The analysis presented in 5.1 indicated that there is indeed a variation across the IMRAD structure, both in the absolute frequency of *on* as well as in the interaction of *on* and *nous*, the other personal pronoun that may be used to refer to the authors themselves in medical research articles.

65 The *Introduction* section was characterized by the interpretative values ON<sub>1</sub> (referring to the Author(s), corresponding to "I/we"), and ON<sub>6</sub> (referring to other(s), corresponding to "he/she/they", other researchers), which is consistent with previous findings. Most of the occurrences correspond to the author role of Researcher. Interestingly, the *Introduction* section also contained some instances of ON<sub>6</sub>, referring to parties external to the author-reader couple, in most cases other researchers. These observations tie in with Swales' (1990) CARS model of *Introduction* sections in research articles, in which he argues that this section is frequently used for identifying gaps in existing research and situating one's own research within the field.

66 The *Methods* and *Results* sections were both dominated by the value ON<sub>1</sub> and the author role of Researcher. In addition, the *Results* section contained several occurrences of *on* that were more ambiguous, in the sense that it was at times

unclear whether *on* referred to the authors exclusively, or to a collective including the reader(s), thus creating a didactic or metatextual effect, including the reader in the process of reasoning.

67 The *Discussion* section was characterized by the value ON<sub>1</sub> and ON<sub>4</sub> (referring to the authors and an “unlimited” discourse community, corresponding to “I/we” + “everybody” [*tout le monde*]), i.e., the generic value of *on*, which is in fact considered to be its default value in French.

68 The article also contained a *Conclusion* section, which is unusual for the medical research articles in the KIAP corpus. The section was characterized by ON<sub>1</sub> and *on* was associated with the author role of the Researcher. In this section, *on* was largely associated with cognitive verbs used as research verbs.

69 In order to complement the qualitative analyses, two quantitative analyses were carried out. Section 5.2 presented an analysis of the distribution of the pronouns *nous* and *on* across the IMRAD structure. A comparison with *nous* was considered useful, because *on* and *nous* may both represent the author’s voice in medical research articles, which generally avoid using the first person singular pronoun *je*, both because of genre constraints and because most medical research articles are multi-authored articles. The results show that the distribution of the pronouns *nous* and *on* varies across the sections of the IMRAD structure, which is consistent with the literature. Both *nous* and *on* are more frequent in the *Introduction* and *Conclusion* sections than in the *Methods*, *Results* and *Discussion* sections. Moreover, these findings are consistent with the observations in 5.1, where the *Introduction* section was seen to correlate with certain rhetorical moves, such as claiming one’s place in the research field, which requires a strong personal presence, manifested, *inter alia*, by the pronouns *nous* and *on*.

70 In Section 5.3, I examined the interaction of *on* and verb types, and to what extent this interaction varies across the IMRAD structure. Verb types are a key indicator of the interpretative value of *on*, by situating the pronoun’s referent in relation to the research process described (research verbs), or through metatextual clues (discourse verbs).

71 The results indicated that the verb types associated with *on* vary across the IMRAD structure. In the *Introduction* section, *constater* and *estimer* are the verbs most frequently associated with *on* and correspond to impersonal or passive constructions such as “is observed”/“is estimated”. The *Materials*, *Methods* and *Results* sections exhibited a greater variation in verb types, as well as a larger number of occurrences of each verb type. Research verbs such as *observer*, *noter* and *estimer* were frequent, and in these cases *on* was associated with the author role of the Researcher. The *Discussion* section was characterized by cognitive verbs, i.e., verbs referring to a mental process or state, such as *savoir* and *ignorer*. Since the number of words in the *Conclusion* section is limited, the results for this section should be interpreted with caution. However the analyses indicate a predominance of modal constructions, associated

with the modal verbs *pouvoir* and *vouloir*. Generally, these constructions seem to be associated with the author role of Evaluator, although modal verbs and modal expressions more generally may also be associated with the author role of Arguer.

- 72 In summing up, the set of analyses allows us to conclude that the IMRAD structure does in fact seem to influence the frequency and interpretative values of *on* across the text. This variation seems to be linked to the regulation of rhetorical structures and argumentative moves that is imposed by the IMRAD format; certain speech acts and micro-purposes are assigned to specific parts of the text. This could in turn be seen as an example of the influence of genre constraints on all sequential units of the research article. The IMRAD structure is therefore a powerful tool for the coherence of the discourse community, because its schema governs the representation of the author's voice and rhetorical structures associated with it.

## References

- ADAMS SMITH, D.E. 1984. Medical Discourse: Aspects of Author's Comment. *The ESP Journal* 3 (1): 25-36.
- BAZERMAN, C. 1988. *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science*. Madison: Wisconsin University Press.
- BHATIA, V.K. 1993. *Analysing Genre: Language Use in Professional Settings*. London: Longman.
- BIBER, D. & FINEGAN, E. 1994. Intra-textual Variation within Medical Research Articles. In N. OOSTDIJK & P. HAAN (eds.), *Corpus-Based Research into Language*. Amsterdam: Rodopi: 201-222.
- BREIVEGA, K.R. 2003. *Vitskapelege argumentasjonsstrategiar. Ein komparativ analyse av superstrukturelle konfigurasjonar i medisinske, historiske og språkvitskapelege artiklar*. Oslo: Skrifter fra prosjektmiljøet norsk sakprosa.
- CARTER-THOMAS, S. & CHAMBERS, A. 2012. From Text to Corpus: A Contrastive Analysis of First Person Pronouns in Economics Article Introductions in English and French. In A. BOULTON, S. CARTER-THOMAS & E. ROWLEY-JOLIVET (eds.), *Corpus-Informed Research and Learning in ESP. Issues and Applications*. Amsterdam: J. Benjamins: 15-44.
- FLØTTUM, K., DAHL, T. & KINN, T. 2006. *Academic Voices: Across Languages and Disciplines*. Amsterdam: J. Benjamins.
- FLØTTUM, K., JONASSON, K. & NORÉN, C. 2007. *ON – pronom à facettes*. Bruxelles: De Boeck-Duculot.
- FRASER, S.A. 2002. A Statistical Analysis of the Vocabulary of Medical Research Articles (2): Differences across the IMRAD Structure. *Integrated Studies in Nursing Science* 4 (1): 27-34.
- GJESDAL, A.M. 2008. *Étude sémantique du pronom ON dans une perspective textuelle et contextuelle*. PhD thesis. University of Bergen.
- HESLOT, J. 1980. La formation des chercheurs à l'expression scientifique écrite. *Langage et société* 12 (1): 35-40.



- LAURIER, C., KENNEDY, W., MALO, J.-L., PARE, M., LABBE, D., ARCHAMBAULT, A. & CONTANDRIOPOULOS, A.-P. 1999. Taux et coût des hospitalisations pour l'asthme au Québec: analyse des données de 1988-1989, 1989-1990 et 1994-1995. *Maladies chroniques au Canada* 20 (2): 92-99.
- LOFFLER-LAURIAN, A.-M. 1980. L'expression du locuteur dans les discours scientifiques: "je", "nous" et "on" dans quelques textes de chimie et de physique. *Revue de linguistique romane* 44 (173-174): 135-157.
- NWOGU, K.N. 1997. The Medical Research Paper: Structure and Functions. *English for Specific Purposes* 16 (2): 119-138.
- PONTILLE, D. 2007. Matérialité des écrits scientifiques et travail de frontières: le cas du format IMRAD. In P. HERT & M. PAUL-CAVALLIER (eds.), *Sciences et frontières: délimitations du savoir, objets et passages*. Cortil-Wodon: Éditions modulaires européennes: 229-253.
- POUDAT, C. 2006. *Étude contrastive de l'article scientifique de revue linguistique*. PhD thesis. University of Orléans.
- RASTIER, F. 2005. Pour une sémantique des textes théoriques. *Revue de sémantique et de pragmatique* 17: 151-180. Available online: [http://www.revue-texto.net/Inedits/Rastier/Rastier\\_Textes.html](http://www.revue-texto.net/Inedits/Rastier/Rastier_Textes.html).
- RASTIER, F. 2011. *La mesure et le grain. Sémantique de corpus*. Paris: H. Champion.
- RÉGENT, O. 1992. Pratiques de communication en médecine: contextes anglais et français. *Langages* 26 (105): 66-75.
- SOLLACI, L.B. & PEREIRA, M.G. 2004. The Introduction, Methods, Results, and Discussion (IMRAD) Structure: A Fifty-Year Survey. *Journal of the Medical Library Association* 92 (3): 364-367.
- SWALES, J. 1990. *Genre Analysis: English in Academic and Research Settings*. Cambridge: Cambridge University Press.
- SWALES, J. 2004. *Research Genres. Exploration and Applications*. Cambridge: Cambridge University Press.