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CERLIS Series
Volume 1

Stefania M. Maci & Michele Sala (eds)

Genre Variation
in Academic Communication
Emerging Disciplinary Trends

CELSB
Bergamo

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CERLIS SERIES Vol. 1

CERLIS

Centro di Ricerca sui Linguaggi Specialistici

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GENRE VARIATION IN ACADEMIC COMMUNICATION.
EMERGING DISCIPLINARY TRENDS

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ALESSANDRA FAZIO

Academic Sports Science Discourse in *Formal* and *Informal* Texts: A Comparison

1. Introduction

The aim of this chapter is to analyse English sports science discourse in academic settings and, in particular, to investigate how formal academic discourse in Native Speakers of English (NS) is reflected in the final theses written by Non-Native Speakers (NNS) of English, i.e. Italian students specializing in a European Master Degree in Health and Physical Activity. A further goal of this explorative study is to identify and compare similarities and differences in the use of sports science terminology in specific academic discourse in English and suggest reasons for these similarities and differences.

The analysis of key concepts – not only substantial differences, but also any peripheral changes –, the way these cluster around logically related root connections will also be taken into account in the process of writing the final thesis. Such an analysis could contribute to both a better understanding of the most frequent biased linguistic tendencies and language teaching. In other words, the challenge is to use corpus analysis in language teaching for specific applications. We assume that when writing for academic purposes, it is important to focus on what to teach as opposed to how to teach the salient features of the genre a student needs to master. The objective of this analysis is therefore to analyse formal language in order to produce informal documents in line with the standardised language premises to guide students towards the controlled production of either content (knowledge) or standardised language structures.

Two corpora were collected and analysed for this purpose: standardised academic sports science written texts made up of Sports Science Research Articles (*SportDiscus* RAs) selected from the *SportDiscus* database and the final theses of Italian MA students using English as L2 (MA theses).¹ This methodological framework is also used by both Biber (2007) and Swales (2004) to investigate and define specificity. Such an investigation is a crucial requisite in this explorative study on the difference between the two corpora. We expect that a possible bias might be representative of an aspect differentiating the two corpora even though the final aim of this overview is to analyse how the reproduction of linguistic strategies and the extension of logic strategies are processed by NNS MA students. This analysis is essentially meant for didactic purposes to be applied at higher educational level to develop our students' specific language skills.

An analysis of the general stylistic framework in both academic texts written by NNS and NS of English was carried out. An examination of the use of recurrent qualitative and quantitative linguistic elements was also conducted, including an analysis of key concepts in terms of *keyness*. Finally, a comparison of the relevant occurrences in both corpora was outlined. Furthermore, it was also possible to explain reasons for any discrepancies used. Key concepts were controlled for their coherence and logical relevancy. Any differences identified were categorised according to either the logical knowledge structure on which the specific language of sport is based, or to the different socio-cultural settings affecting language patterns; not only substantial differences were classified, but also likely complementary aspects of linguistic and logical discourse were systematically organised.

Data and results were processed with the latest technological tools facilitating the identification of new ways and/or directions of inter-relationships in seemingly unstructured textual data. Such new tools, in fact, appeared to pinpoint not just the quantitative distribution

1 From now on we will refer to Sports Science Research Articles and final theses of Italian MA students respectively as *SportDiscus* RAs and MA theses. For a detailed description of the two corpora see Section 3.

of data, but they also stimulated analysis, affording subtle connections in ways that were previously not possible with the manual tools available.

2. Terminology and language variation

Terminology and language variation need to be explored through corpus investigation techniques as stated by Hunston (2002). In Biber's (2007: 3) words,

The first major approach to discourse – the study of language use – has been carried out from several perspectives [...]. Many of these approaches focus on the study of linguistic variation, showing how linguistic choice is systematic and principled when considered in the larger discourse context. [...] Most corpus-based research is discourse analytic in this sense, investigating systematic patterns of language use across discourse contexts, generalized over all the text in a corpus. The advantages of a corpus approach for the study of discourse, lexis, and grammatical variation include the emphasis on the representativeness of the text sample, and the computational tools for investigating distributional patterns across discourse contexts.

In addition, as a starting point of this investigation the notion of discourse community requires attention and highlighting. In 1990 Swales quoted Herzberg's well-known words (1986) i.e. "the language used in a group is a form of social behavior, *in which discourse is a means of maintaining and extending the group's knowledge and of initiating new members into the group; discourse is epistemic or constitutive of the group's knowledge* [the author's italics]." Therefore, in order to analyze the specific discourse of a given community language variation is essential. Hunston's definition of variation was taken into account. In her words (2002:159):

The study of variation is [...] the study of comparison between discourses produced at different times, or for different purposes, or by different groups of people, or under different conditions [the author's italics].

In the present study the two objects of research are: the European Master theses written by Italian students (MA theses), on the one hand, and, on the other, a corpus of Sports Science RAs (*SportDiscus* RAs) representing respectively what we called ‘informal’ texts written by NNSs of English and the ‘formal’ standardized Reference Corpus of Research Articles written by NSs of English. The need to label the two corpora in order to distinguish one from the other meant that a choice was made to focus attention on the degree of formal acceptance by the scholars of the ‘formal’ sub-field language already indexed in specific language databases. Consequently, we defined as “informal” the students’ tentative reproduction of the RAs model language.

3. Materials, tools and data collection

Two corpora were collected for this analysis. The so-called ‘informal’ corpus consists of eight final dissertations for a Master degree discussed in 2009 (see Figure 1). These theses focused on the following subjects: ageing (in particular, physical activity for the elderly), physiology and related issues (specifically, exercise training), child sport, doping, physical activity and mental health.



Figure 1. The ‘informal’ European Master Theses Corpus (MA theses).

The 'formal' reference corpus includes 224 Sports Science RAs all of which were selected from *SportDiscus*,² the most comprehensive source of complete text documentation for sport and applied sciences (see Figure 2). Criteria of selection are explicitly quoted below.



Figure 2. The 'formal' Sport Science RA Reference Corpus (RAs).

The RA reference Corpus consisting of RAs taken from five of the most prestigious scientific / academic journals in the field of sport is made up of articles collected over a 12-month period (all over 2010). Their reliability is determined by the relevance ratio and the impact factor. Obviously these five academic journals as well as the RAs were chosen from the same sub-fields as the Master theses topics. In addition, RAs were not chosen randomly but all the articles published in 2010 written by NS of English were included in the reference corpus selection.

2 The *SportDiscus* database was used as an information retrieval tool. Firstly, it was possible to carry out a simple search by writing a word or by refining the search using *and/or* logical operators. Secondly, documents could be found by searching through lists of indexed publications or the *SportDiscus* thesaurus (i.e. by means of key words). The sorting of documentation can be carried out by referring to source types. Finally, the relevancy ratio indicated in each document was also taken into account.

4. Method of analysis

In this section, corpus analysis will be carried out followed by a discussion of the parameters used to establish language variation. It needs to be pointed out that this is a preliminary analysis of final theses of a post-graduate Master course aimed at refining students' knowledge of English as a second language according to a formal academic register, with a focus on specifically useful elements of advanced grammatical structures conforming to the formal academic register required by the academic writing genre in a specific field.

Our study is a preliminary investigation in the formal literature of a specific sub-field of sports science in view of extending the research to a wider field of interest. The intention is to highlight the main crucial elements and compare language and the conceptual variation between the two corpora. Examples were provided from both the language viewpoint (repeated occurrences, co-occurrences) and the conceptual structure (*keyness*, keywords and key concepts).

With regard to the conceptual structure, what immediately emerged from our master theses was mainly 1) terms or word strings referring to specific physical overlapping activities with 2) different applied sciences in an attempt to find 3) a common ground of research to determine health, fitness and a correct lifestyle showing the conceptual complexity of this field. Figure 3 shows the complexity as well as the interdisciplinary nature of this specific field of investigation.

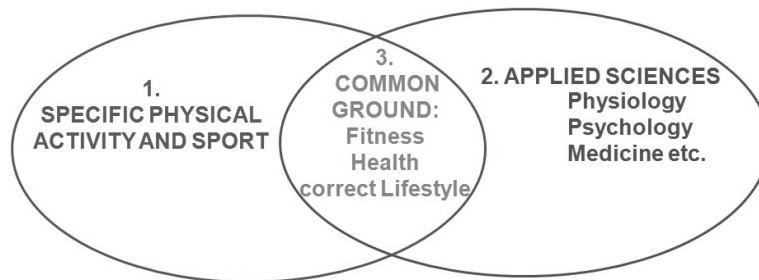


Figure 3. Sports Science conceptual complexity.

4.1. Language structure

According to Hunston (2002: 157), “there is a long tradition in the investigation of register variation and the study of genre but corpora have added a new dimension to the kind of research that can be undertaken”. Language variation is investigated here from a genre (Swales 1990, Bathia 1993) *and* corpus-based perspective.

Among the different parameters taken into consideration by Biber *et al.* to study language variation, we used and adapted parameter descriptions listed in Hunston (2002: 160-169) as shown in Table 1. In order to compare language variation between the two corpora produced in different situations, the parameters shown in Table 1 were taken into account: term frequency, term meaning and use, language feature frequency, frequency of co-occurrent language items.

Term frequency	Term meaning and use	Language feature frequency	Frequency of co-occurrent language items
Linguistic reference between corpora of key terms/words is not controlled and often irregular.	Random control of keyword frequencies and reference consistency appear to be different.	Functional grammar features and language structures are distributed unevenly in the analyzed corpora.	Language items that usually co-occur in clusters or ‘association patterns’ (Biber, 1996) are analyzed to determine string frequency and patterns.

Table 1. Parameters of variation (adapted from Hunston 2002: 160-169).

In this study, *term frequency* refers to terms that in Hunston’s words (2002: 161-162)

[...] are not distributed evenly across registers, but occur more frequently in one register than another [...] Word-classes, as well as individual words, also differ. Nouns are more frequent in news and academic prose than in other registers, and least frequent in conversation. This reflects the density of

information in the various registers, particularly the complexity of noun phrases in academic prose.

Term meaning and use refer to different meanings and uses sometimes associated with “different frequencies of words in different registers” (Hunston 2002: 162). For example,

the adjective *massive* is used in science writing with a technical sense of ‘large in mass’ and modifies nouns such as *star*, *black hole* and *planet*. In journalism, it is used with a more general sense of ‘very big’ and modifies nouns such as *blow*, *boost*, *gamble* and *profits*. (Hunston 2002: 162)

Reference to *language feature frequency* analyses language and grammatical structure frequency considering grammatical features as well as terms “distributed unevenly across registers (Hunston 2002: 162)”. For instance, it has been found that negative forms are much more frequent in conversation than in writing (Tottie 1991: 17). However the use of negatives in academic prose focuses mainly on interactivity; they position the reader to hold certain assumptions. Some verb forms as well as differences in tenses are also unevenly distributed across registers (Mindt 2000). Finally, with regards to co-occurrence of variation labelled in the table above as *frequency of co-occurrent language items*, we refer to Biber’s (1996: 173) “association patterns”, that is “the systematic ways in which linguistic features are used in association with other linguistic and non-linguistic features”. In addition, collocation, clusters and co-occurrent features were considered, bearing in mind “the tendency of *terms* and grammar features to associate with given genres” as pointed out by Hunston (2002:164).

Several examples were taken from a preliminary analysis of a post-graduate MA thesis requiring a more refined knowledge of NNSs of English used in a formal academic register and style. Useful advanced grammatical elements specifically conforming to a formal academic register were emphasized. From the point of view of language structure, examples characterized by statistical frequency of occurrence related to the use of modifiers, negative forms, verbs and emerging keywords were provided. The following illustration shows the distribution of the frequency of occurrence of modifiers in both

corpora. The two peak numbers of occurrences in the informal discourse appear to be ONLY and ESPECIALLY – language items with a direct counterpart in NSs of Italian.

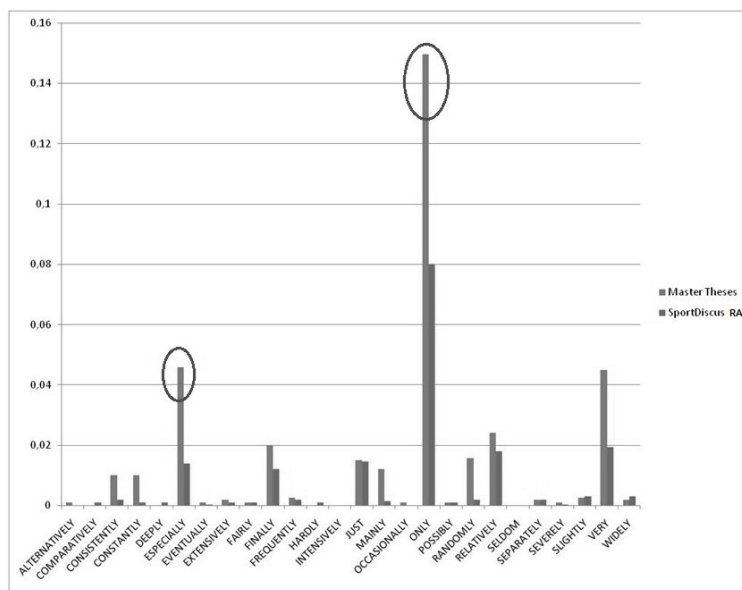


Figure 4. Frequency of MODIFIERS.

With regard to the use of the negative form, the expression NOT ONLY is widely present throughout the text in a limited corpus of the MA theses, while occurrences were found in the much wider Reference Corpus of RAs in a 1(MA theses) / 2 (*SportDiscus* RAs) relationship where the corpora are in a 1(MA theses) / 10 (*SportDiscus* RAs) relationship approximately (see Table 2 and Figure 5).

	Total number of words	NOT ONLY occ.
MA theses	165,762	50
SportDiscus RAs corpus	1,397,812	110

Table 2. 1/10 Ratio between corpora: MA theses vs RAs amount of words.

The graph in Figure 5 shows the normalized data related to the use and distribution of the expression NOT ONLY.

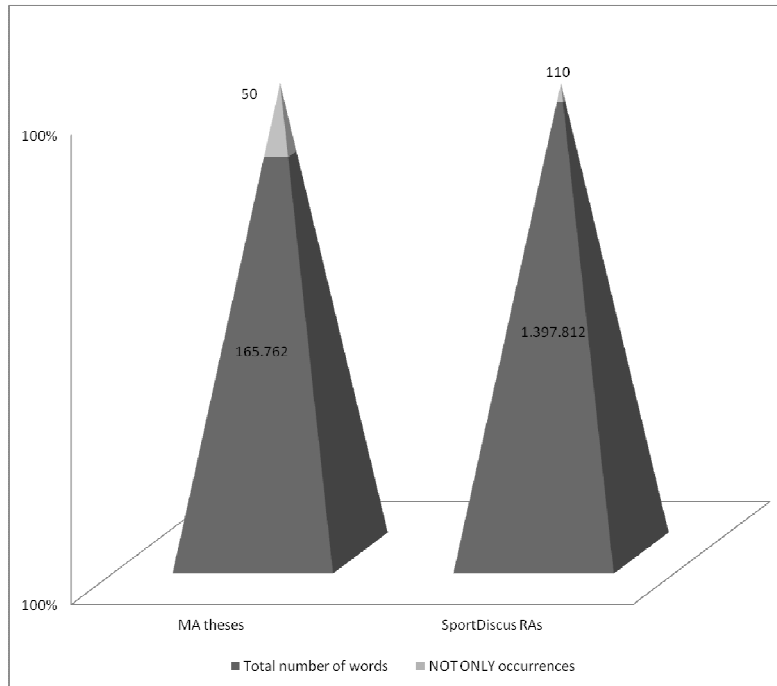


Figure 5. Representation of normalized data related to NOT ONLY.

The use of NOT in the *SportDiscus* RAs reference corpus is also much more varied as shown in Table 3.

Use of “ <i>NOT</i> ” PATTERN in <u>Master Theses</u>	Use of “ <i>NOT</i> ” PATTERN in <u>SportDiscus RAs</u>
<p>NOT ONLY NOT ALWAYS NOT AFFECTED BY NOT RELATED TO NOT SIGNIFICANT NOT PRESENT NOT TREATED NOT NECESSARILY NOT SIGNIFICANTLY</p>	<p>NOT ONLY NOT DIFFERENT NOT SIGNIFICANT NOT SHOWN NOT POSSIBLE NOT AFFECTED NOT PRESENT NOT SURPRISING NOT RELATED NOT CONSISTENT NOT SUFFICIENT NOT NECESSARILY NOT SIGNIFICANTLY</p>

Table 3. Negative form Comparison/Variation: the use of NOT.

Alternative occurrences of NOT+ADJECTIVE are negative forms expressed by NEGATIVE PREFIX + ADJECTIVE. The use of this type of negative form is more forceful and provides a more immediate and straightforward negative connotation. Some of these negative forms are commonly used to demonstrate a fairly satisfactory level of language competence, e.g. untrained, unexpected, unrelated, unchanged, unusual. These examples refer to the NEGATIVE PREFIX + ADJECTIVES OCCURRENCES we found in the MA theses corpus. All the examples feature adjectival phrases as mentioned above (PREFIX + ADJECTIVES). Other adjectives clearly denote a highly sophisticated level of language competence, e.g., unequivocal (eight occurrences in the Master Theses Corpus) but never mentioned in the RAs Reference Corpus as shown in Table 4.

<p>Use of negative adjectives “UN-” PREFIX in <u>Master Theses</u></p> <p>UNTRAINED UNEXPECTED UNRELATED UNCHANGED UNUSUAL UNFIT</p>	<p>Use of negative adjectives “UN-” PREFIX in <u>SportDiscus RAs</u></p> <p>UNACCEPTABLE UNACCUSTOMED UNADJUSTED UNAFFECTED UNAIDED UNALTERED UNAMBIGUOUS UNANSWERED UNANTICIPATED UNATTAINABLE UNAVOIDABLE UNAWARE UNBALANCED UNBIASED UNCERTAIN UNCHANGED(60 occurrences) UNCLEAR UNCOMFORTABLE UNCOMMON UNCONDITIONAL UNCONSCIOUS UNCONSTRAINED UNCONTROLLED UNCORRECTED UNCOUPLING UNCOVERED</p>
<p>Other adjectives used... UNEQUIVOCAL (8 occurrences) UNEQUIVOCALLY UNCLEAR UNCHANGED</p>	

Table 4. Negative form comparison variation: the use of negative adjectives “UN-” PREFIX.

Considering the distribution of *Present Perfect* variation between the two corpora, Figure 6 shows the total number of occurrences referring to the Present Perfect (more than 10 occurrences per 1,000 words were counted). Furthermore, it is to be emphasized that in the MA theses corpus the verb TO BE shows a relative frequency of occurrence

denoting a poor level of language knowledge and above all of formal standard use. It was also observed that the Present Perfect of the verbs DEMONSTRATE, FAIL, FIND, SHOW and SUGGEST were the most frequently used verbs in the MA theses corpus while the RA Reference Corpus showed a much more extensive range of choice with a wide use of Present Perfect forms such as HAVE BEEN, AFFECTED, ALLOWED, ALTERED, BECOME, CAUSED, CHARACTERIZED, CONTRIBUTED, CREATED, DECREASED, DEMONSTRATED, EMERGED, EXAMINED, FAILED, FOCUSED, FOUND, HAD, IDENTIFIED, INCREASED, INDICATED, INFLUENCED, INVESTIGATED, LEARNED, LED, LIMITED, MEASURED, OBSERVED, OCCURRED, PLAYED, PREVENTED, PRODUCED, PROPOSED, PROVIDED, RECEIVED, REDUCED, REPORTED, RESULTED, REVEALED, SEEN, SHOWN, SUGGESTED, USED, YIELDED.

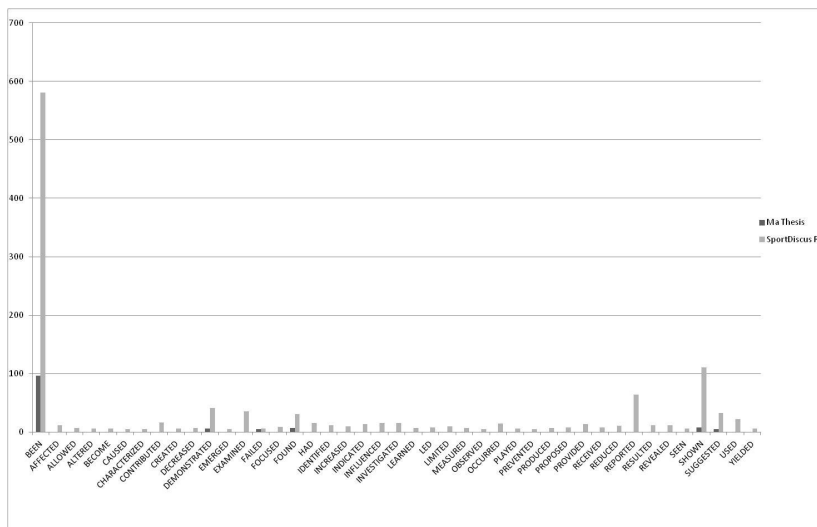


Figure 6. Distribution of Present Perfect variation (verbs are reported in Past Participle form): “Studies / Exercises / Skills have + Pres. Perfect”.

Figure 7 shows the frequency distribution of the *passive voice* occurrence throughout the texts. The high level of variation and difference in the choice of lexis used is worthy of note. The formal language seems to be constructed with fewer fixed formulae while

Master students seemed to use a wider range of lexical items with fewer occurrences. Reasons for this difference might be due to the use of specific standard protocols required in RAs while the more varied use/choice of linguistic items in MA theses suggests limited observance of scientific formulae.

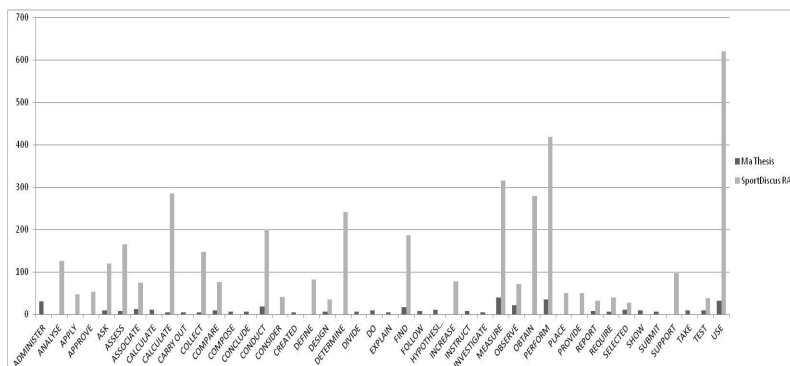


Figure 7. Distribution of passive voice variation (verbs are reported in infinitive form)

The frequency of co-occurrent language items, taken from a comparison between the Master Theses Corpus and *SportDiscus* RAs has also been analyzed. EXECUTIVE emerged as a relevant keyword. Table 5 shows the most frequent co-occurrences of EXECUTIVE.

Relevant keyword emerging from <u>MA theses</u> and <u>SportDiscus RAs</u> : EXECUTIVE + co-occurrences
EXECUTIVE FUNCTION(S)
EXECUTIVE CONTROL
EXECUTIVE PERFORMANCE
EXECUTIVE TASKS
EXECUTIVE CONTROL TASKS
EXECUTIVE FUNCTION COMPONENTS
AMOUNT OF EXECUTIVE CONTROL
EXECUTIVE FUNCTION DEVELOPMENT
CENTRAL EXECUTIVE
DEVELOPMENT OF EXECUTIVE FUNCTION
DIVERSITY OF EXECUTIVE FUNCTION
SUBSET OF EXECUTIVE FUNCTION

Table 5. Frequency of co-occurrent language items.

The pre-modifying adjective EXECUTIVE depicts in full the specificity of our department's field of study centered on human movement and related physical exercise execution.

4.2. Conceptual structure

The conceptual structure emerging from *SportDiscus* RAs is related to Figure 3 above, showing the conceptual complexity of this specific field. Some examples of sports science academic terminology were provided from an analysis of keyness terms, facilitating a comparison between the *SportDiscus* reference corpus of RAs and the BNC, thus establishing the relevant keywords in *SportDiscus* RAs as confirmed and specified in the opposite relationship between MA theses and RAs discussed above.

From a conceptual point of view, Table 6 shows the most significant keywords out of the first 150 processed words in the list. Terms related to specific physical and sports activities are highlighted in light grey, terms related to the applied sciences (physiology, psychology, medicine etc.) are highlighted in dark grey, while interdisciplinary terms (related to a common ground of study such as fitness, health, correct lifestyle etc.) are in white fields and emphasized in bold.

N.	Key word
1	EXERCISE
2	MUSCLE
3	ACTIVITY
4	PHYSICAL
5	ATHLETES
6	PHYSIOLOGY
7	MOTOR
8	ADULTS
9	OLDER
10	TRAINING
11	BEHAVIOR
12	PERFORMANCE

N.	Key word
13	EFFECTS
14	SKELETAL
15	INTENSITY
16	CONTROL
17	MAXIMAL
18	KINETICS
19	INSULIN
20	POSTURAL
21	AEROBIC
22	AGING
23	BLOOD
24	ENDURANCE

25	OBESE	36	GAIT
26	WALKING	37	SEDENTARY
27	FATIGUE	38	COGNITIVE
28	MEDICINE	39	GENDER
29	PROTEIN	40	MOVEMENT
30	VASCULAR	41	CYCLING
31	STRENGTH	42	COORDINATION
32	PHYSIOLOGICAL	43	HEALTH
33	CARDIOVASCULAR	44	SWAY
34	OBESITY	45	LACTATE
35	COACHES	46	HYPOXIA

Table 6. List of relevant keywords.

The comparison between *SportDiscus* RAs and BNC shows that the list of significant keywords was strictly dependent on the field of analysis. Facts were specifically described and reflected in the language. Generally speaking, the language of sport and sports science, including the relevant sub-fields, represents factual and descriptive elements. The language under investigation in this study obviously reflects the main purpose of the study itself: that is, the analysis of the characteristics of human movement and related implications. From this perspective, the list of keywords presented proves to be perfectly coherent with the assumption of our study: language structures are taught while concepts are shared in the language knowledge process.

5. Conclusion and further development

This quantitative analysis in terms of compared frequency has highlighted a difference between the two quantitatively defined corpora in the use of language and grammar. The comparison of the cross-analysis of *keyness* confirmed coherence in the conceptual structure in two directions: 1) the comparison between formal

(*SportDiscus* RAs) and informal (MA theses) corpora/texts; 2) the adequacy in the specific language field representation.

The massive occurrence / co-occurrence of the term EXECUTIVE as a relevant keyword and pre-modifier fully represents the didactic objectives of our department. This is not surprising, as Master theses inevitably conform to didactic aims. Furthermore, it does not seem to be difficult to rationalize this exploratory path to optimize the final results of didactic objectives. From this perspective, an official/institutional ad-hoc syllabus could be designed covering specific corpus linguistic techniques aimed at:

- helping students to detect, identify and assimilate language;
- developing conceptual strategies in the formal standard literature;
- applying language competence to better and fully represent a final conceptual framework, with a view to achieving a rational conceptual approach.

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