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DOCTORAL THESIS

DIRECTIONALITY IN CONVERSION: THE INFLUENCE OF CRITERIA AND SENSES

Alba E. Ruz Gómez

Supervised by:
Prof. Salvador Valera Hernández (University of Granada)
Prof. Bożena Cetnarowska (University of Silesia, Katowice)

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ABBREVIATIONS

AD	Attestation date
ADJ	Adjective
BNC	*British National Corpus*
D1	First-order derivation
D2	Second-order derivation
Der	Derivatives
DP	Derivational paradigm
EXT	Extended
FIG	Figurative
PHR	Phrasal expression
FO	Frequency of occurrence
N	Noun
nReg	Number of registers
OED	*Oxford English Dictionary*
RR	Range of registers
RR12	RR according to Lee's (2001) classification into twelve registers
RR71	RR according to the BNC register classification into 71 registers
RU	Restrictions of usage
SD	Semantic dependence
SP	Semantic pattern
SR	Semantic range
V	Verb

ABSTRACT

The directionality of word-formation processes remains a controversial area and a much neglected one, specifically in areas like the bracketing paradoxes of overt derivation, conversion and back-formation, to name the main ones.

This thesis researches directionality in conversion in English, where remarkably little progress has been made since Marchand (1963a, 1964), especially compared with other languages, where recent publications have contributed significantly, especially about Czech (cf. Ševčíková 2021) and Dutch (cf. Don 1993, 2004). Perhaps the major step forward is a methodological one, whereby directionality is claimed to be ascertained accurately only if identified according to senses within lexemes, not according to lexemes. This is so specially in conversion, where the polysemanticity of the process allows for multiple directions within the same lexeme according to each of the senses and, therefore, as remarked in the literature (cf. Plank 2010), derivation may have taken place in either direction according to each of the possible senses.

The thesis starts out from a pilot test on the accuracy of Marchand's content criteria (semantic dependence, restrictions of usage, semantic range, semantic pattern), and the frequency of occurrence and register usage in overt affixation (Ruz & Cetnarowska 2023). Intended as a standard of comparison, and remarkably one where the criteria do not prove to be conclusive in all cases even if they are run on cases of overt affixation, the same criteria are

examined on a sample of English pairs of noun/verbs related by conversion. The sample was obtained from the *British National Corpus* so the results are relevant for present-day English. Unlike other publications on this specific point (e.g. Bram 2011), the criteria are researched by senses instead of by lexemes whenever possible. This is, notably, not the case for every criterion under study. For the most objective analysis possible, senses are separated following the sense separation used in the *Oxford English Dictionary*.

The results obtained are validated statistically with the best possible test for each case. They show that directionality in conversion can hardly be ascertained according to Marchand's criteria viewed as a unitary set of criteria, even less when run according to senses instead of by lexemes. While the results obtained using this procedure are undoubtedly closer to how the derivational process may have operated in each case, directionality in English noun/verb conversion cannot be identified consistently by the set of criteria, if a perfect match across criteria is aimed at. Instead, the most frequent profile is one where some criteria clearly signal one direction whereas others signal the opposite one.

Keywords: lexical semantics, directionality, criteria, conversion, lexical senses.

RESUMEN

La direccionalidad de los procesos de formación de palabras sigue siendo un área controvertida y poco desarrollada, concretamente en ámbitos como las paradojas de paréntesis de la derivación con afijos, la conversión y la retroformación, por citar las principales.

Esta tesis investiga la direccionalidad en la conversión en inglés, un área donde se ha avanzado muy poco desde las publicaciones de Marchand (1963a, 1964), sobre todo en comparación con otras lenguas, donde las contribuciones más recientes han aportado avances significativos, especialmente en el checo (cf. Ševčíková 2021) y el neerlandés (cf. Don 1993, 2004). Quizá el mayor avance experimentado en este tiempo sea de tipo metodológico, en concreto la hipótesis de que la direccionalidad sólo puede determinarse con precisión si se identifica según los sentidos de los lexemas, y no según los lexemas. Tal es el caso especialmente en conversión, donde la polisemanticidad del proceso permite múltiples direcciones dentro del mismo par derivado por conversión según cada uno de los sentidos, como se señala en la bibliografía (cf. Plank 2010).

La tesis parte de una prueba piloto sobre la validez de los criterios de Marchand de dependencia semántica, restricciones de uso, rango semántico y patrón semántico, así como la frecuencia y aparición en registros en la afijación mediante afijos explícitos (Ruz & Cetnarowska 2023). A modo de patrón de comparación, en el que los criterios no resultan concluyentes en

todos los casos aunque se apliquen a casos de afijación manifiesta, se examinan los mismos criterios en una muestra de pares de sustantivos/verbos relacionados por conversión en inglés. La muestra procede de un muestreo del *British National Corpus*, por lo que los resultados son pertinentes para el inglés actual. A diferencia de otras publicaciones sobre este punto específico (por ejemplo, Bram 2011), los criterios se investigan por sentidos en lugar de por lexemas siempre que sea posible, lo cual, cabe destacar, no se aplica a todos los criterios objeto de estudio. Para que el análisis sea lo más objetivo posible, los sentidos se separan siguiendo la división de sentidos en el *Oxford English Dictionary*.

Los resultados obtenidos se validan estadísticamente con la prueba estadística más adecuada en cada caso. Los análisis estadísticos muestran que la direccionalidad en la conversión apenas puede determinarse según los criterios de Marchand, al menos no si se les considera un conjunto unitario de criterios, menos aun cuando se aplican dichos criterios según los sentidos en lugar de por lexemas. Aunque los resultados obtenidos mediante este procedimiento sin duda se acercan más a cómo puede haber operado el proceso derivativo en cada caso, lo cierto es que la direccionalidad en la conversión sustantivo/verbo en inglés no puede identificarse mediante el conjunto de criterios propuesto por Marchand si lo que se pretende es obtener un resultado coherente de todos los criterios. En su lugar, el perfil más frecuente es aquel en el que algunos criterios señalan claramente una dirección mientras que otros señalan la contraria.

Palabras clave: semántica léxica, direccionalidad, criterios, conversión, sentidos léxicos.

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The concept of *conversion*, also known as *zero-derivation*,[1] has raised questions since its first attestation in the 18th century English grammars (cf. Sundby 1995: 36–37, 104, 107–108). Under the view that there is a derivational connection between the pairs, this thesis approaches one of those open questions, namely *directionality*, or which lexeme is the base and which is derived in a pair of paronymous lexemes. Both the unresolved status of this question (cf. Bauer & Valera 2005: 11) and the renewed attention that it has received over the past years (see, among others, Umbreit 2010; Bram 2011; Kopecka 2013; Lohmann 2017; Kisselew et al. 2016; Valera 2017, 2023; Tribout 2020; Iordăchioaia et al. 2020; Ševčíková 2021; Don 2023; also Ruz & Cetnarowska 2023, on directionality in English affixation) bring to the fore the relevance of conversion as a subject of research.

The focus is specifically on directionality in canonical conversion between nouns and verbs in English, e.g. *jump*^{N} and *jump*^{V}. Cases which have typically been described under the term *conversion* but which do not involve a morphological operation, i.e. there is no change of word class, are outside the scope of this study. Some of these cases are, e.g. the change in nominal features such as that of mass/count nouns, e.g. 'some *coffee*' vs 'two *coffees*',

[1] This thesis uses the term *conversion* as a widespread descriptive term, without any theoretical implications, or opposition to the use of the term *zero-derivation* as a conceptual device.

or verb valency alternations of the type causative-inchoative, e.g. '*John* broke *the window*' vs '*The window* broke'. These are sometimes referred to as *partial conversion* (cf. Zandvoort 1972: 266–276; or Valera 1999, for reviews on complete and partial conversion), *secondary conversion* or *secondary word-class change* (cf. Quirk et al. 1985:1563–1567), or *type coercion* (cf. Bauer et al. 2013: 557–559). Cases involving other major and minor word classes, prepositions, compounds, phrases, participles, or where there are minor formal changes of the type *belief/believe* are not considered here either (see e.g. the description in Bauer et al. 2013: Section 25.3.1). The conditions for canonical conversion are listed in Section 2.3.2.

1.2 JUSTIFICATION AND HYPOTHESIS

This thesis researches Marchand's (1964) criteria for the identification of directionality in English conversion (cf. also Marchand 1963a for directionality in back-formation). Specifically, Marchand's criteria of content (e.g. semantic dependence, restriction of usage, semantic range, and semantic pattern, cf. Section 2.5.6), and the qualitative-distributional criteria of frequency of occurrence and range of register are examined in this thesis (cf. Section 2.5.7 for their description). These criteria have often been transmitted uncritically, and their application, as in Bram's (2011) thesis, as the largest study on directionality in English conversion, reveals a degree of indeterminacy that remains unresolved to this day.

This thesis starts out by testing the accuracy of the criteria, e.g. how true it is for a base to be more frequent than its derivative in a sample of affixation. This is intended to identify potential issues in the applicability of the criteria and to identify relevant criteria as opposed to criteria that have been put forward but may not prove relevant. The criteria are then tested in a data sample of English noun/verb conversion.

A major point of this thesis is that it takes into consideration the role of senses, not of lexemes, as comparable units for the identification of conversion, following the observations made by Plank (2010: 87). Consequently, the directionality of the process is studied by considering the various senses of the conversion-related lexeme pairs.

The hypothesis is that directionality in conversion remains a controversial issue partly for the difficulty inherent in the process of conversion, but partly also for the criteria used in the identification of

directionality and for the level (lexeme vs sense) at which these criteria have been applied this far, and this being for two reasons:

i. although conversion has often been described by analogy to other word-formation processes, mainly to affixation, it may not react to Marchand's tests similarly, and
ii. although it is often noted in the literature that, in previous studies, semantics has not received the importance it deserves, no reference has applied Plank's proposal that directionality should be studied by word senses and not by lexemes. It is therefore unknown how directionality may vary in conversion according to the selected criteria applied to the senses attested for each lexeme in conversion pairs.

1.3 AIMS OF THE THESIS

This thesis tests several semantic and quantitative-distributional criteria for directionality in a sample of present-day English noun/verb conversion. The aims are to study:

i. how feasible it is to apply the criteria at the level of sense, not of lexemes (in line with Plank 2010), and
ii. how reliable Marchand's (1964) criteria for directionality are when applied by senses.

1.4 METHODS

This is an experimental thesis that relies on database evidence for the identification of the relevance of various criteria for directionality described in the specialized literature, and their applicability at the level of sense.

The experimental part starts with a pilot study to test Marchand's criteria with respect to directionality in affixation. The aim is to decide whether the criteria prove applicable to word-formation processes outside conversion, and to identify potential issues in their applicability. For this purpose, the sample of data includes lexicogenetically clear bases: nouns, verbs, and adjectives. For these, all the possible class-changing derivatives are extracted, and the criteria are then applied.

A stratified sample of formally identical noun/verb lexeme pairs, which are morphologically and semantically related but categorially different, is extracted from the *British National Corpus* (hereafter BNC), a corpus of contemporary British English suitable for the purpose of this thesis (cf. Section 3.2).

Although etymological criteria are not considered here (i.e. the method based on earliest attestations is not followed, cf. Bauer & Valera to appear), semantic criteria are an essential part of the thesis, and, in this regard, the thesis relies on the *Oxford English Dictionary* (hereafter OED) for an objective classification of the senses that the lexemes can take. Statistical procedures are applied to the analysis of the data as necessary.

1.5 STRUCTURE AND CONTENTS

This thesis consists of six chapters, each containing several sections, and chapters 2–5 including an introduction and a summary or recapitulation for easier reading, as follows:

i. Chapter 1 constitutes an introduction to the thesis.
ii. Chapter 2 reviews issues surrounding the description of conversion in English, with a focus on directionality and the criteria for directionality available in the literature.
iii. Chapter 3 describes the methods used for the study of directionality in this thesis: First, the resources used, and then the methods for a pilot study on affixation, and for the study on the applicability of the criteria in a sample of present-day English noun/verb conversion.
iv. Chapter 4 presents the key findings regarding the applicability of the criteria for directionality in a sample of present-day English noun/verb conversions, namely, semantic dependence (SD), restrictions of usage (RU), semantic range (SR), semantic pattern (SP), frequency of occurrence (FO), and range of registers (RR).
v. Chapter 5 discusses the key findings regarding the relevance of the criteria for directionality and comments on the methodological issues found and the implications for the study of directionality in conversion in English.
vi. Chapter 6 presents the conclusions of this thesis.

To meet the requirements established by the University of Granada for the International Doctorate Mention, three more sections are added in Spanish:

i. an abstract of the thesis,
ii. a translation of the conclusions (Chapter 7), and
iii. a detailed summary of the thesis (after the references section).

1.6 TYPOGRAPHICAL CONVENTIONS

The typographical conventions used in this thesis are as follows:

i. Small capitals are used for semantic categories (e.g. INSTRUMENT or INSTRUMENTAL).
ii. Italics are used for:
    1. first mention of the name of dictionaries, corpora or other resources (e.g. *Oxford English Dictionary*),
    2. emphasis and reference to concepts or terminology, e.g. "The concept of *conversion* […]", and
    3. example words or concordances (e.g. *fathom*^{V}).
iii. Double quotation marks (" ") are used for:
    1. quotations (e.g. the following quotation in Section 2.3 in this thesis: This is in line with Bauer & Valera's (2005: 12) claim that "[…] directionality implies a process and thus in any system which sees conversion as directional it is automatically assumed that conversion is more than just a relationship between static lexemes",
    2. sense definitions from dictionaries e.g. the definition for *fathom*^{V} (FIG_SIMILATIVE) "b. To get to the bottom of, dive into, penetrate, see through, thoroughly understand." (OED), and
    3. examples of concordances from the BNC where a specific sense is used in context, e.g. "*Loren was upstairs, engaged in that long getting-ready process that he'd never quite been able to* **fathom**." (BNC), unless provided as an individual enumerated example (in italics).
iv. Single quotation marks (' ') for glosses (e.g. *lúfu* 'love' > *lúfian* 'to love' (OE)),
v. The source of the examples extracted from dictionaries and corpora is specified between brackets after each example (e.g. "*Monster cars sharked past, the cluster of Wall Street skyscrapers loomed […]*" (BNC), or indicated in text,
vi. Numbers of tables and figures are preceded by their section number (e.g. Table 4.3.1.2 is the second table in Section 4.3.1). If only one table appears in a section, it receives the same name as the section (e.g. Table 3.4.1 is the only table in Section 3.4.1),

vii. Citation of bibliographical references, both in-text and on the list of references, is in accordance with The Generic Style Rules for Linguistics (Haspelmath 2014).[2]

[2] Available at https://www.eva.mpg.de/lingua/pdf/GenericStyleRules.pdf.

CHAPTER 2

DIRECTIONALITY IN CONVERSION

2.1 INTRODUCTION

The concept of *conversion*, also known as *zero-derivation*,[3] has raised questions since its first attestation in the 18th century English grammars (cf. Sundby 1995: 36–37, 104, 107–108). Under the view that there is a derivational connection between the pairs, this thesis approaches one of those open-to-discussion questions surrounding the description of conversion in English, namely *directionality*, or which lexeme is base and which derived in a pair of paronymous lexemes. Both the unresolved status of this question (cf. Bauer & Valera 2005: 11) and the renewed attention that it has received over the past years (see, among others, Umbreit 2010; Bram 2011; Kopecka 2013; Lohmann 2017; Kisselew et al. 2016; Valera 2017, 2023; Tribout 2020; Iordăchioaia et al. 2020; Ševčíková 2021; Don 2023; also Ruz & Cetnarowska 2023, on directionality in English affixation) bring to the fore the relevance of conversion as a subject of research.

Chapter 2 introduces the notion of conversion as described in the literature and as understood in this thesis and then dives into the issue of directionality and the directionality criteria available in the literature. Specifically, Chapter 2 is divided into the following subsections:

[3] In this thesis, the term *conversion* is used as a widespread descriptive term, without any theoretical implications, or opposition to the use of the term *zero-derivation* as a conceptual device.

i. Section 2.2 introduces the contrast between the terms *conversion* and *zero-derivation*.
ii. Section 2.3 describes the approach to conversion adopted in this thesis and outlines the conditions to identify canonical conversion in English.
iii. Section 2.4 introduces the issue of directionality, focusing on whether there is a need to establish directionality, on why directionality is identified as an issue in conversion, and on difficulties in the study of directionality.
iv. Section 2.5 presents criteria available in the literature for directionality, and comments on their applicability and on previous studies which have used those criteria.
v. Section 2.6 summarizes this review chapter.

2.2 CONVERSION OR ZERO-DERIVATION

Conversion[4] is typically defined as the word-formation process whereby a word changes its word-class category without undertaking any change on its form (cf. Biese 1941; Zandvoort 1975: 265; Marchand 1969: 359; Leech 1974: 214; Lieber 1980: 187 et passim; 2005: 418; Bauer 1983: 32; Quirk et al. 1985: 1520, 1558; Kastovsky 1989; Lipka 1990: 75; Cetnarowska 1993; Don 1993; Štekauer 1996; Vogel 1996; Bauer & Huddleston 2002: 1640; Bauer & Valera 2005: 8; Manova 2011; Valera 2014, 2015, among others). Examples (1) and (2), synchronically described as canonical cases of noun/verb conversion in English, are the focus of this thesis*:*

(1) *love*^{N} / *love*^{V}
(2) *deal*^{V} / *deal*^{N}

Already since the early works by Sweet (1891/1898), Kruisinga (1927, 1931/1932), Koziol (1937, in Grzega 2004: 117), Biese (1941), Nida (1949), Zandvoort (1975), Marchand (1969), Lipka (1971), or Kastovsky (1969), among others, various issues surrounding these cases have been a source of disagreement among authors. Even though more than a century has passed since the first works on these cases, many issues surrounding conversion remain unanswered in present-day English description.

[4] Several authors point out that the term *conversion* is probably to be attributed to Sweet (1891/1898; cf. Cetnarowska 1993: 14; Bauer & Valera 2005: 7).

One of the issues that aroused interest in the literature, and still does, has been that of which term is more adequate to refer to conversion, as proven by various publications (e.g. Bauer & Valera 2005; Iordăchioaia & Melloni 2023) and conference workshops on the issue (Iordăchioaia & Melloni 2020; Fernández-Alcaina & Valera 2022; Vasile, Moroianu & Valera 2022; Fernández-Alcaina & Valera 2024). Various terms are available in the literature,[5] but the debate often focuses on the contrast between *conversion* (Bauer 1983: 32; Bauer & Huddleston 2002: 1640) and *zero-derivation* (Marchand 1969: 359; Kastovsky 1989; Lipka 1990: 75).

Although both *conversion* and *zero-derivation* have often been used to refer to the same cases in the literature, it is important to note their different implications. While the term *zero-derivation* highlights the fact that these cases belong to word formation by implying that there is a process whereby a new lexeme is created by means of a *zero morph*, the term *conversion* does not necessarily imply a derivational process. Admittedly, both terms have been used interchangeably in the literature to refer to the word-formation process whereby new lexemes are formed without any formal mark signalling the process. Whenever this is not the case, *conversion* has typically been used to describe a purely syntactic phenomenon (cf. Trnka 1954: 54, cited in Cetnarowska 1993: 14), or in complementation with the term *zero affixation* to refer to syntactic transposition, e.g. the interpretation of the noun *government* as an adjective in *government job* (cf. Marchand 1969: 360).

The adequacy of these terms emerges from a difference in the conceptualization of the process and, consequently, none of the terms is without criticism. In turn, the conceptualization of the process is a major issue, as conversion has been described as "slightly mysterious", and remains unclear (if accepted as a process) whether it is a subtype of derivation or a separate process of word formation (Bauer & Valera 2005: 12). Also, because the base lexeme does not stop to exist as the term would seem to imply, but base and derivative coexist (Bauer & Huddleston 2002: 1641). Zero-derivation has been criticised with the argument that zeros in linguistics have meaning but no substance, which is just opposite to mathematical zeros (McGregor 2003: 111–114, in Segel 2008: 7), or, as Bauer (2019: 18) puts it, because "[…] since a morph is defined as a form, a form with no form is an

[5] For a more detailed account of the various terms used for conversion, see Lieber (1980, 2004), Don (1993, 2005), Štekauer (1996), Plag (1999), Fábregas (2005), Bram (2011: 36–60), Bauer et al. (2013: 562–567) or Valera (2014, 2015).

embarrassment". Arguments against the term *zero-derivation* have also been raised for the difficulty of proving the existence of zero morphemes and for the proliferation of zeros or how to differentiate between possible contrasting zero-affixes (cf. Bauer & Huddleston 2002: 1641; Bauer et al. 2013: 563; cf. also Valera 2014: 155, and references therein). However, as pointed out in Valera (2014: 155):

> [l]ater discussions of the concept of zero-derivation lay stress on the fact that the contrast between conversion and zero-derivation is less important than the fact that the process in question is a derivational process, and so whichever term is used becomes "[…] basically a metatheoretical-formal question" (Kastovsky 1997: 85–86).

Which term is more adequate to describe these cases lies outside the scope of this thesis, even if the analysis of directionality might cast light on the differences or similarities of the two terms. The approach to conversion adopted in this thesis is described in Section 2.3.

2.3 THE APPROACH IN THIS THESIS

More generally, controversy has arisen on the description of conversion or where to include it in language description. This is a complex issue that has been approached from several perspectives. Various terms have been proposed, linked to the various approaches that describe conversion either:

i. as a word-formation process (e.g. the terms *conversion* or *zero-derivation*), or
ii. outside word formation (e.g. *lexical relisting*, *reduplication*, *multifunctionality*, or *underspecification*).

It is here argued that a synchronic analysis of directionality, at least as regards semantics, seems compatible with most approaches to conversion and may prove relevant regardless of whether conversion is a word-formation process or otherwise.[6] This is because even if conversion is not viewed as word formation, e.g. it is viewed as *lexical relisting* (cf. Lieber 1980: 198–203, 1992, 2004: 94–95), as innovations based on pragmatic principles of interpretation (Clark & Clark (1979), as "rebracketing" of a lexical item

[6] Except for approaches that consider that a single lexeme is involved, e.g. the view of conversion as *multifunctionality* or *underspecification*, or the view of conversion as inflection (cf. the references in Section 2.4.1.1).

(Strauss 1982, cited in Bauer et al. 2013: 564), or as "conceptual recategorization" (Štekauer 1996: 45–46), it can be argued that there is a pair of lexemes belonging to different classes and, consequently, semantic relation(s) between lexical items. Thus, even if not in terms of word formation, a directional analysis is plausible, or as Lieber (1980: 187–188) puts it, "[…] whereas the 'syntax' of conversion is non-directional, the semantics of conversion may be governed by directional rules".

Specifically, this thesis considers conversion as a directional process, resulting in the creation of new lexemes from already existing ones in a language. This is in line with Bauer & Valera's (2005: 12) claim that "[…] directionality implies a process and thus in any system which sees conversion as directional it is automatically assumed that conversion is more than just a relationship between static lexemes". This section is organised as follows:

i. Our view of conversion is further described in Section 2.3.1.
ii. The conditions for canonical conversion, which is the focus of this thesis, are outlined in Section 2.3.2.

2.3.1 Conversion as a lexeme-creation process

Conversion in English is approached in this thesis as a dynamic or asymmetrical word-formation process whereby a base lexeme is used for the formation of a derivative under the conditions of formal identity and word-class contrast (Leech 1974: 214; Lieber 1980: 187 et passim; Bauer 1983: 32; Quirk et al. 1985: 1520, 1558; Don 1993; Štekauer 1996: 15 et passim; Vogel 1996: 258 et passim; Bauer & Huddleston 2002: 1640; Manova 2011: 55 et passim; Bauer et al. 2013: 562–3; Valera 2014, 2015, among others). It is thus considered that in conversion there are two lexemes, not one, as e.g. in the view of conversion as underspecification. A relation is assumed between the lexemes too and thus also directionality.

As for the lexical relation between pairs of lexemes in canonical conversion, it is here considered to be best covered by the term *paronymy*, just as the relation in pairs formed by affixation (in line with Cruse 1986 and Valera & Ruz 2021).[7] A different position is presented in Bauer et al. (2013: 546), such that conversion lies "[s]omewhere in the range between homonymy and polysemy".

[7] For a discussion on the relations proposed in the literature for the relationship between conversion pairs and related cases, see Valera & Ruz (2021).

This thesis takes a synchronic approach, so no distinction is made between conversion and other processes that have resulted in a similar output synchronically "[…] but that may not qualify as conversion diachronically" (Valera 2015: 324). This is because "[…] the synchronic analysis of word-derivation does not always parallel the diachronic formation of a word" (Dearmond 1969: 355, cited in Pennanen 1984: 80), e.g. *lúfu* 'love' > *lúfian* 'to love' (OE) corresponding to the pair *love*^{N}/*love*^{V} in present-day English.

2.3.2 The conditions for canonical conversion

The various attempts to identify conversion in the literature have highlighted several aspects of the process such as the fact that it is *non-iconic*, as expressed in terms of Natural Morphology (cf. Manova 2011; Cetnarowska 2011: Section 5.3, 2017; or Valera 2015: 332), *non-concatenative* (cf. Plag 2003: 107; Plag et al. 2009: 104), or *non-compositional* (Crocco-Galèas 1990), or the productivity of the process for deriving new lexical items (cf. Kastovsky 1969; Adams 1973: 37; Tournier 1985: 198; Quirk et al. 1985: 1558; Bauer & Huddleston 2002: 1642; Plag et al. 2009, among others).

In this thesis, the conditions for canonical conversion are defined as follows (cf. Marchand 1963a: 176, Cetnarowska 1993; Kerleroux 1999; Valera 2014, 2015, among others):

i. It involves at least two lexemes, which belong to two different word-class categories that can be identified in context or use. The change in word class is reflected in the change in the inflectional paradigm and syntactic function of the lexemes (Valera 2015: 322).
ii. There are no formal or phonological distinctions between the lexemes, i.e. they are formally identical (described in terms of an identity operation in Bauer 1983: 32).
iii. The lexemes are morphologically related: one is the base of the process and the other is derived from the former.
iv. The lexemes, or the senses they express, are semantically related. This connection has been most typically explained in terms of the lexemes sharing their core meaning or their most prototypical or salient aspect (cf. Sanders 1988: 157; Crocco-Galèas 1990; Twardzisz 1997; Kövecses & Radden 1998; Dirven 1999; Radden & Kövecses 1999; Schönefeld 2005; Kopecka 2013: 357; Martsa 2014: 452–453; Rainer 2014: 348–349, among others), but extended senses may allow for conversions too.

v. There is directionality between the lexemes in that one or various of their senses may serve as a base for new converted senses in the other pair (cf. Plank 2010).

In relation to the latter two criteria, this thesis aims to support the idea that the lexemes in conversion pairs may be interrelated such that, e.g. some of the senses of the noun may act as bases for the creation of new related senses in the verb, and vice versa. This may lead to chains of semantic derivations between lexemes, and to the identification of new senses in both directions between a pair. This thesis is thus in line with Plank's (2010) claim that directionality should be studied at the level of sense and not of lexeme.

2.4 THE ISSUE OF DIRECTIONALITY

The term *directionality*, as understood in this thesis, refers to the possibility of new lexemes to be formed from already existing lexemes in a language. As Iacobini (2000: 866) describes it, "[t]he principle of directionality recognises a relationship between two morphological items (a base and a derived word) in which one is characterized with respect to the other because of the adding of extra meaning together with the adding of phonic material". This principle applies in this thesis except for the latter condition, which does not apply in all cases, e.g. in canonical conversion or back-formation.

Thus, directionality is here considered to be present in the various semantic-extension mechanisms or lexeme-creation processes in a language, i.e. it is not exclusive to the process of conversion. This is in line with Kastovsky's (2005: 41) claim that derivational processes in present-day English are "necessarily directional". However, different degrees of importance are given to directionality in the various approaches to conversion. Section 2.4 is organized as follows:

i. Section 2.4.1. focuses on views on the need to establish a direction between conversion pairs.
ii. Section 2.4.2. introduces difficulties in the study of directionality in conversion.

2.4.1 Is there a need to establish directionality?

There is a debate as to whether there is a need to establish directionality in the first place. This is partly because directionality is given different degrees

of importance in the various approaches to conversion (cf. 2.4.1). Under some approaches, directionality has no relevance (2.4.1.1.), other linguists recognize it but claim that it is difficult to determine (2.4.1.2), while another group of linguists argues that directionality in conversion may have varying importance (2.4.1.3).

2.4.1.1 Directionality as irrelevant

An analysis of directionality is rejected in approaches to conversion in terms of *multifunctionality* or *underspecification* (originally in Whorf 1945, cited also as 1937/1956 in Valera 2014; later recalled in Lipka 1971: 213–215; Nida 1975: 99; Robins 1978: 58 as *grammatical neutrals*; or Farrell 2001: 109, 116, 128, among others). Within these approaches, it is argued that roots in English are unspecified for word class and, thus, that the same neutral lexical element can surface as various linguistic functions depending on the context of use, so an analysis of directionality has no place. Similarly, under approaches which treat the phenomenon as inflection, an analysis in terms of directionality does not make sense (cf. Myers 1984; Josefsson 1997; Giegerich 1999, all cited in Bauer & Valera 2005: 9).

The direction of conversion has also been claimed to be irrelevant synchronically. For instance, Bergenholtz & Mugdan (1979) argue that synchronically there is no priority in the meanings or uses of the lexemes in different syntactic contexts. It has been pointed out, however, that in derivation in general "[…] one is almost always able to make an intuitive statement about the direction of derivation, and about the word-class affiliation of the base underlying a derivative without great difficulty" (Kastovsky 1976: 26). In fact, Kastovsky highlights the importance of introducing the base of a process as containing the appropriate word-class affiliation and not as categorially indefinite for linguistic description, also in conversion, e.g. *clear*^{V} meaning 'to cause to become *clear*^{ADJ}, with emphasis on the semantic aspect of the process. This typically accepted claim may be the reason why, in approaches that describe conversion as non-directional, the semantic connection between the lexemes in conversion is highlighted, or even an analysis in terms of semantic rules has been posited. For instance, Ljung (1977) claims that no derivational or directional relation holds between members of converted pairs, e.g. *comb*^{V} : *comb*^{N} or *saw*^{V} : *saw*^{N} in an equation of such conversions to cases of exonym-endonym pairs such as *dig*^{V} : *spade*^{N}. Ljung (1977: 169–71, and references therein). The author argues that in such

conversions the verbs are not semantically dependent on the nouns because one can carry the actions denoted by the verbs with other objects (e.g. one can comb one's hair with the fingers), and that the instruments in these cases are simply strongly associated with the actions. However, Ljung later admits a strong semantic connection between conversion terms to the extent that, if the semantics of the instrument are extended, the meaning of the verb may be extended too (1977:174), which leads to an analysis of these cases in terms of "fully productive instrument-verb-creating rules which permit the extension of instrument-denoting nouns into verbs expressing the use of these nouns" (cf. Ljung 1977: 178). Similarly, Lieber (1980), who proposes that both members of a conversion pair are equally listed in the lexicon as basic or derived and can belong to different word-class categories depending on the context of use, argues against a directional syntactic rule of conversion, on the arguments that it leads to the proliferation of zeroes or of directional rules in conversion. Yet, the author recognizes "directional semantic rules" between the terms, which she describes in terms of redundancy rules (Lieber 1980: 187–188, 203–206). In fact, Lieber (1980: 203) states that an analysis of the semantics of conversion is, in principle, independent from their syntactic analysis of conversion, and that "[…] the semantic analysis can involve directionality without arguing in any way against the non-directionality of the syntactic analysis".

2.4.1.2 Directionality as unpredictable

An analysis of conversion as a directional process in terms of *bidirectionality*, or *multidirectionality* has been proposed too. Leech (1981: 224–225), for instance, bases his argument on conversions for which an analysis of both directions could be possible. Similarly, Umbreit (2010) follows a cognitive approach based on word-families, L2 acquisition and speakers' judgements, and proposes that, because some cases remain unclear, a bidirectional understanding of lexical motivation is better suited to account for all kinds of motivational pairs. Motivational relations can nevertheless display a certain tendency towards one direction, so Umbreit (2010: 323–324) presents directionality as a continuum.

Similarly, some authors recognize directionality but have claimed that it is virtually impossible to tell a direction between formally identical pairs because of the number of irregularities found in the lexicon (Langenfelt 1933, cited in Marchand 1963a: 178; Jackendoff 1974), or it is difficult for

the polysemy involved (cf. Twardzisz 1997, who regards motivation in conversion as "[…] a complex multi-directional sanctioning phenomenon"). The semantic complexity in conversion may be one of the reasons why some authors may have chosen to ignore the issue of directionality, focusing on other aspects of the process, or have directly excluded conversion from their analyses.

2.4.1.3 Directionality as relevant

The research by several other authors explicitly or implicitly assumes the existence of directionality in conversion. This is especially so in studies which regard conversion as a process with a morphological and semantic relation between lexemes. However, dissimilar importance has been paid to the issue of directionality also among authors who recognize it.

For instance, Štekauer (1996), who takes an onomasiological approach, recognizes the issue in conversion but regards directionality as secondary and focuses on other aspects of the process, e.g. the phonological differences between the conversion pairs.

Other linguists have paid special attention to the issue of directionality, either by proposing some criteria or by discussing the relevance of the criteria typically proposed in the literature to assess directionality between conversion pairs (cf. Marchand 1963a, 1963b, 1964, 1969; Adams 1973; Kastovsky 1976; Clark & Clark 1979; Kiparsky 1982; Sanders 1988; Cetnarowska 1993; Plag 1999, 2003; Iacobini 2000; Bauer & Valera 2005; or Valera 2014, among others; cf. Section 2.5).

Furthermore, several authors have carried out empirical studies in English and other languages to test some of the criteria to assess directionality. This has been done:

i. with the aim to test and discuss the applicability of the criteria proposed in the literature (among others, Bladin 1911; Hertrampf 1932, cited in Marchand 1963a: 178; Biese 1941; Jespersen 1949; Don 2004; Balteiro 2007; Plank 2010; Umbreit 2010; Bram 2011; Kisselew et al. 2016; Lohmann 2017; Tribout 2020; Iordăchioaia et al. 2020; Ševčíková 2021), or
ii. with the intention to classify conversions in related studies, e.g. with a focus on the semantic patterns typically expressed by conversion. In this regard, see, among others, Valera (2017), with a focus on the diversity

of semantic changes between conversion pairs, Valera (2020), on the semantic patterns in noun/verb conversion in English, Valera (2023), on a comparative study of the semantic patterns in English and Spanish conversion, Mititelu et al. (2023), on the meaning of zero verbs and zero nouns, and Hledíková & Ševčíková (2023), on a comparative study of the semantics between nouns and verbs in Czech and English from a paradigmatic and a cognitive approach.

It is here considered that analyses that deny directionality, or claim that it is irrelevant and thus simplify the analysis and representation of the pairs, e.g. not requiring the assignation of a base or derivative, dismiss the relevance of a directional approach to conversion for linguistic description in areas such as morphology, syntax, lexical semantics, and pragmatics. This is because these analyses do not account, among others, for the possible motivations or constraints on conversion, the semantic relations found, frequency effects, etc. Conceptualizations of conversion as bi-directional or multi-directional dispose of the so-called chicken and egg question, finding support in the lack of clear evidence for a preferred direction of conversion, either from historical, semantic, or statistical analyses. However, such approaches also disregard the semantics of the process, the formal complexity (when relevant), or its quantitative aspects, e.g. frequency of use.

This thesis supports an analysis of conversion as directional. Specifically, the issue of directionality in conversion is approached from a synchronic perspective, and it will be argued that directionality should be studied with special attention to the semantics of the process.

The main reasons why directionality is an issue in conversion are mentioned in Section 2.4.2, and some difficulties for the study of directionality in conversion are presented in Section 2.4.3.

2.4.2 Why is directionality an issue in conversion?

Even though directionality is central to most approaches to lexical semantics and word formation, it is most typically in conversion where it has been pointed out as a controversial issue. This is partly due to the formal aspects of the process, and particularly also because of the contradictions between the various methods used to decide on directionality in conversion (cf. Section 2.5).

In word-formation analyses, conversion has often been described by analogy with overt word-formation processes, especially with affixation. This is because both processes share the same function, i.e. that of creating new lexemes and concepts to address the needs of a community of speakers (cf. Trnka 1969: 184; Sanders 1988: 155; Payne 1997: 8, cited in Valera 2014: 155; Ungerer 2003: 563). In fact, as brought up by Ungerer (2003: 534–535) "[…] the grammatical function of suffixation has been so pervasive that it has led to the inclusion of conversion in the morphological paradigm by postulating a process of zero derivation". [8] However, the fundamental difference between the two processes lies primarily in formal grounds. This is because word-class changing affixation seems to reflect the structural patterns of a language in that an affix is typically added to a simpler lexeme (which is the base of the lexeme-formation process) for the creation of a more complex derivative lexeme, e.g. *direction*^{N} (base) + *-al* (suffix) > *directional*^{ADJ} (derivative). In contrast, in English conversion, both the base and the derivative are formally identical, the process being formally unmarked. Conversion has been described as "le procede le plus simple" ('the simplest process' [my translation]) (Kerleroux 1999: 100), but it is precisely this formal simplicity of conversion which makes an analysis in terms of directionality challenging.

It must be noted, however, that directionality is not always straightforward in processes other than conversion, e.g. in *reconsideration*^{N} (*re-* + *consideration*^{N} or *reconsider*^{V} + *-ation*) (cf. Plag 2003: 2.4, on multiple affixation), or e.g. in *asymmetric*^{ADJ} (*symmetry*^{N} > *symmetric*^{ADJ} > *asymmetric*^{ADJ}, or *symmetry*^{N} > *asymmetry*^{N} > *asymmetric*^{ADJ}) (cf. Iacobini 2000: 869, on cases of double motivation). In back-formation, e.g. *editor*^{N} > *edit*^{N}, directionality is also an issue partly because the complexity of the lexemes does not reflect the direction of the derivation, the process being anti-iconic (cf. Marchand 1963b, on directionality in back-formation; see also Iacobini 2000: 872–874 for difficulties in the analysis of other "problematic" phenomena, specifically, back-formation, clipping, subtraction, and truncation).[9]

[8] Even if the processes are typically paralleled in their functionality or output, it has been discussed that the range of formations by affixation does not cover all the cases by conversion (cf. Sanders 1988: 168).

[9] Interestingly, references often point to semantics as the solution. For instance, Iacobini (2000: 870) mentions that "[…] processes which do not formally express the

This thesis is in line with the literature that stresses the relevance of directionality in the description of present-day English word formation, lexical semantics and, particularly, in the description of conversion.

2.4.3 Difficulties in the study of directionality

When approaching the issue of directionality, several difficulties may arise. Some of them are discussed in the following subsections, specifically:

i. Section 2.4.3.1 briefly comments on the implications of considering conversion as word-based or not,
ii. Section 2.4.3.2 is on the difference between a diachronic and a synchronic approach to directionality, and
iii. Section 2.4.3.3 discusses the importance of an analysis of directionality at the level of sense instead of lexeme.

2.4.3.1 Conversion as root-, stem-, or word-based

One of the difficulties of conversion is whether it is root-based, stem-based, or word-based. This usually varies depending on the language under study.

In English, at least under synchronic approaches that consider conversion a lexeme- or word-formation process, conversion is typically accepted as word-based, and thus a directional analysis makes sense. This is the view here too, although this thesis uses the term *lexeme* instead of *word* because it is here considered that the term *lexeme-based* is more precise (following Iacobini 2000: 868). A view of conversion as root-based may thus be discarded in this thesis (cf. Section 2.4.1.1).

It should be noted, however, that even if conversion is accepted as occurring between lexemes, the possibility of a smaller number of cases having a root-based origin is not discarded. In this regard, it has been argued that both a root-based formation and a word-based formation do not necessarily exclude one another, at least in English (cf. Don 2023: 7).

2.4.3.2 Diachronic vs synchronic analysis

Another difficulty in the study of directionality in conversion comes from considering the issue of directionality from a synchronic or from a diachronic

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direction of derivation nevertheless respect it semantically, and […] cases which seem to contradict the principle of directionality, as does back-formation, can be reinterpreted just in the light of this principle".

perspective (cf. Section 2.5 for various criteria used to determine directionality in the literature, both from a synchronic and from a diachronic approach).

While directionality has been claimed to be relevant for diachronic analyses, it has been indicated as relevant and "convenient" in synchronic descriptions of conversion too (Quirk et al 1985: 1558). It has been pointed out, however, that approaching conversion from these two perspectives often gives contradictory results (Marchand 1963a: 180; Adams 1973: 40; Cetnarowska 1993: 37–39; Bauer & Valera 2005: 11; Bram 2011: 90, among others). This is fundamentally because the two approaches focus on different aspects of the phenomenon. Specifically, diachronic analyses are concerned with the historical development of the lexemes in a language, i.e. how words were introduced or created in a language, whereas the focus in synchronic analyses is rather on the semantic relation and sense development between the pairs as in present-day English.

This thesis takes a synchronic approach to directionality in conversion. Pairs of lexemes that may not be considered conversion from a diachronic approach but that have the same result (cf. Valera 2015: 324), e.g. because of diachronic levelling, may be considered conversion in a synchronic approach.

2.4.3.3 Directionality at the level of lexeme vs sense

Conversion has typically been studied according to semantics at the level of lexeme, even if the role of senses has often been highlighted in the literature on derivation. For instance, Marchand (1964: 12) makes the claim that "[a] word may be a derivative in one sense and not in another. Both verb and substantive may follow separate trends of semantic development that are not necessarily paralleled by the other pair member". This is similar to the implications of Quirk et al.'s (1985: 1529) claim that "[c]onversion shows lexicalization having specific sense orientation, in that only a particular sense of a word may be converted to another word class". Thus, it is here considered pertinent to study specifically which of the senses of a base is converted.

Even more relevant for this thesis is Plank's (2010) study on conversion in the German example *fett*$^{\text{ADJ}}$/*Fett*$^{\text{N}}$/*fett-*$^{\text{V}}$ 'fat', which shows that conversion operates over senses and that directionality may differ depending

on which of the senses of the lexemes are at play.[10] Plank (2010: 87) emphasizes that directionality should be studied at the level of sense and not of lexeme, because several bases and several derivatives may exist within the same polysemous lexeme according to the senses of the input and the output. Plank also notes that the issue of directionality may pose a problem where lexical asymmetries can be established with some degree of conviction too, and questions standard assumptions about the integrity of lexemes:

> Instead of taking for granted that semantic complexity invariably motivates the same directions of morphological derivation for all relevant lexical items and across all languages, it is an empirical issue to determine, for particular derivational oppositions and for particular semantic subsets of senses, whether asymmetries are diachronically stable or unstable and crosslinguistically uniform or diverse. (Plank 2010: 87)

Research has recently emphasized the relevance of an analysis of conversion by senses (among others, Valera 2017, 2020, 2023; Iordăchioaia et al. 2020; Ševčíková 2021; Iordăchioaia 2022; Ševčíková & Hledíková 2022; Hledíková & Ševčíková 2023; cf. also Ruz & Cetnarowska 2023, for an analysis of directionality by senses in English affixation). It must be noted, however, that the difficulty of an analysis of directionality at the level of sense has often been pointed out in the literature too. For instance, Valera (2015: 328) claims that identifying the base and the derivative by senses rather than by lexemes

> […] multiplies the difficulty inherent in the identification of directionality in conversion, but is consistent with the relative independence of senses within lexemes as regards their use in word-formation, or at least with the fact that derivation can pick up on a specific sense for creation of a new word and not others within the same lexeme.

Most likely the difficulty of such an analysis is the reason why some authors who have approached directionality, and who have looked at the semantics of the pairs, have done so only to a limited extent, typically disregarding the

[10] Note that, although it may be argued that Plank's (2010) paper relies on the analysis of a single example, the analysis of this case clearly supports the points raised in the paper, which may apply to other cases and to other languages.

polysemy of the lexemes and focusing only on the core or central sense expressed by the pairs. This thesis underlines the crucial role of senses in derivation and follows Plank's (2010) claim that directionality should be studied by senses.

2.5 CRITERIA TO DETERMINE DIRECTIONALITY

When authors have approached the issue of directionality in conversion, they have done it from various perspectives and this has led to contradictory results in some cases. Marchand (1963a: 180) shows "[h]ow completely different the etymological and historical aspect is from the derivational one" with the example *moan*, the noun (c. 1225) being recorded earlier than the verb (16th c.). Thus, the noun is the base from a diachronic perspective, but it is analysed as the 'act of moaning' by derivational criteria with a focus on the semantics of the terms, the noun thus being regarded as a derivative from the verb (cf. also Adams 1973: 40 for examples of how senses do not seem to indicate the same direction as OED attestation dates). Contradictory analyses regarding the directionality of specific pairs are available in the literature too. For instance, as noted by Sanders (1988: 158), while Quirk & Greenbaum (1973: 441) analyse the pair *cover* as Verb-to-Noun, Clark & Clark (1979: 770) analyse this case as the opposite direction, Noun-to-Verb (cf. also Cetnarowska 1993: 37–39 on equivocal results between the criteria).

Even if there are pairs for which no agreement (regarding their direction) is found between various authors, a series of criteria proposed in the literature make it possible to identify the direction of derivation in most cases (Iacobini 2000: 871). The criteria posed in the literature for the identification of directionality in conversion are introduced in Sections 2.5.1–2.5.7, with a recapitulation in Section 2.5.8.

2.5.1 Historical criteria

An approach to the issue from a diachronic perspective proposes to determine directionality on the basis of historical evidence (cf. the studies by Bladin 1911; Hertrampf 1932, cited in Marchand 1963a: 178; Biese 1941; Jespersen 1949: Ch. VII, VII; Tournier 1985; Štekauer 1996; Balteiro 2007, among others). Specifically, authors who take this approach choose to rely on first-attestation dates for the pairs, i.e. whether a lexeme was first recorded as noun or as verb. Other information about their origin from etymological

dictionaries has also been considered, e.g. information about the cultural factors that may have influenced the creation of the pairs, the influence of analogy or of similar words, their status as borrowings, innovations, etc.

A diachronic approach is relevant for the description of the history of a language, i.e. how words are introduced in a language at a specific time and in a specific context, but such an analysis proves problematic in various respects:

i. The sources for language analysis are limited, and the dates of first attestation may not necessarily reflect the lexemes' creation and usage in a language because, as Biese (1941: 11) emphasizes research has revealed that "[…] a number of words can be ante-dated". This is for words for which attestation dates are frequently not clearly indicated, e.g. rare words and cases when both lexemes go back to Old English and it is not possible to establish which lexeme was used first at the time.
ii. It is particularly difficult to decide on directionality for pairs attested around the same short-span of time, historical dictionaries not telling in many cases which lexeme precedes the other in usage, because the first attestation dates are sometimes too close (Marchand 1963a: 177, 1969: 297; Adams 1973: 40). It has been emphasized that "[c]onversion mates may have occurred in written texts at the same time, especially if they were borrowed from French or Latin" (Cetnarowska 1993: 24), and that, in these cases, the arbitrary assumption in that the base is the one which has cognates in Germanic languages (Marchand 1963a: 177–178). For the same reasons, it is sometimes difficult to establish a precedence for very recent coinages just based on attestation dates.
iii. Language is not static: new usages emerge for already-existing lexemes, and new words are created everyday, based on the need of a community of speakers and on the influence of other languages or cultures, among other things. In this regard, as pointed out by Plag (2003: 108; cf. also Cruse 1986: 133), "[…] complex semantic changes may overwrite the original direction of conversion", i.e. new senses may emerge or disappear for specific pairs, and the directionality may be reversed over time, or may differ for the various senses of the lexemes. A diachronic approach may not reflect the speakers' intuitions, and a synchronic analysis has been suggested as a more decisive indicator.

A diachronic account has thus been discarded in this thesis, in agreement with claims that it is based on extralinguistic information or has little heuristic value to begin with (Iacobini 2000: 870; Valera 2020: 326), and that such an account should be discarded in a synchronic approach. This is because it may not capture the current directionalities or sense relations between conversion pairs, in other words, "[…] etymological and historical estimates may not correspond to present-day judgments" (Cetnarowska 1993: 24).

2.5.2 Intuition criterion

Other authors appeal to native intuition to decide on a directionality in conversion (cf. Adams 1973, who uses intuition as the primary criterion, and considers other criteria too when intuition fails; Bergenholtz & Mugdan 1979; Clark & Clark 1979, on innovations by conversion; or Umbreit 2010, among others). This approach relies on the native speakers' or proficient users' judgments to decide which member of a pair is the base and which one is the derivative, assuming that the directionality may be determined by the semantic or syntactic properties of the words involved, or by the frequency or familiarity. Intuition has also been used as a secondary criterion too, e.g. by Biese (1941), who resorts to intuition when historical information fails to indicate a direction, on the grounds that "[…] an ordinary speaker would be able to state which use, the nominal or the verbal one, is to be regarded as the original function of the word" (1941: 5).

Intuition, as well as other approaches that focus mainly on the semantics of the pairs, seems to be in line with the idea that directionality in conversion should be "[…] examined without any preconceptions adopted from the analysis of the older stages of the language" (cf. Trnka 1969: 185; cf. Section 2.5.6 for synchronic semantic criteria). The main advantage of an approach that relies on intuition is its easy applicability, as no external evidence or data are required. Indeed, such an approach can identify general tendencies or patterns, as perceived synchronically. The main drawback is that intuition is subjective, and inconsistencies may be found in its applicability as different speakers of a language, perhaps influenced by factors such as the context of use or register, their culture, dialect, etc., may disagree on the same conversion pair.

2.5.3 Morphological and phonological criteria

Another proposal has been to approach the issue of directionality by considering formal aspects in the pairs: morphological and phonological ones. The assumption is that structural or formal differences can be found between lexemes, and these differences point to their basic or derived character.

In this regard, Marchand describes a series of criteria to establish a "derivational relationship" between back-derived words (1963b) and words unmarked by derivational morphemes (1963a, 1964). Among the criteria of external form or "formal criteria", Marchand (1964: 15–19) lists the following:[11]

i. The phonetic shape of the lexemes: "[a] certain phonetic shape may put a word in a definite word class" (Marchand 1964: 16), e.g. the characteristically nominal ending *-ment* in *document*.
ii. The stress placement found in the lexemes, which Marchand (1964: 17–19) signals as indicative of a derivational relationship between unmarked lexemes, wording out various possibilities, e.g. '*export*^{N} vs *ex*'*port*^{V}, to show the derived character of the noun, as verbs are typically stressed on the final syllable.
iii. The morphological type of the lexemes may also be "[…] indicative of the primary or derived character of composite words" (Marchand 1964: 16), e.g. because there are a large number of compound nouns of the types *snowball* (N+N) or *blacklist* (ADJ+N) in comparison to verbs.

The application of these criteria has been explored in studies on conversion in various languages. For instance, Hayes (1981), cited in Kiparsky (1982), or Kiparsky (1982) use level ordering, focusing on the (ir-)regularities and differences in stress patterns in English noun/verb conversion in disyllabic pairs (while taking semantics also into account). More recently, Lohman (2017), presents an empirical study of how phonological cues of nouns and verbs can be used to tell the directionality of noun/verb conversion in English (for words that are at least two syllables in length). The paper also discusses the relations of phonological properties with other criteria commonly employed to ascertain directionality.

For languages other than English, several authors have laid emphasis on formal characteristics: Don (1993, 2004) with a focus on the

[11] The examples in this section are taken from Marchand (1964).

(ir-)regularities and complex syllabic structure for noun/verb pairs in Dutch, Rodrigues (2009) on differences in thematic vowels and stress patterns in noun/verb conversion in Portuguese, or Tribout's (2020) tests of morphological criteria (nominal gender and verbal inflection in French, along with other criteria, except that with inconclusive results).[12]

The advantage of an approach to directionality based on formal distinctions is that it uses easily-applicable, objective criteria. The main drawback is probably that, at least in English, the criteria mentioned do not apply to all cases of conversion and, thus, the directionality of pairs which do not show formal characteristics, i.e. certain endings, stress differences, etc., remains unresolved. Furthermore, counterexamples are found (cf. Bram 2011: 85–86). Specifically regarding Aronoff's (1976) distributional criterion based on morphological types (or similarly Marchand's 1964 criterion of morphological type), it remains unclear how big the differences in the distribution of the types should be, the criterion not being applicable where a similar distribution is found. Also, as Rainer (1993: 52) remarks, it remains to be determined if this criterion mirrors psychological reality. Finally, like diachronic criteria, formal criteria do not account for the semantics in conversion, and may not reflect the speakers' intuitions, or the lexeme's usage.

2.5.4 Structural criteria

Another approach to directionality relies on finding parallel cases of overt derivation. This has typically been referred to as the "Overt Analogue Criterion" (cf. Sanders 1988: 160–161, in its restricted version, 164–165 for the generalized version of this criterion, and references therein): "One word can be derived from another of the same form in a language (only) if there is a precise analogue in the language where the same derivational function is marked in the derived word by an overt (nonzero) form". According to this account, the verb *pattern* would be derived from the noun (*pattern*^{N} > *pattern*^{V}), because the relation can be paralleled to the one in cases such as (*drama*^{N} > *dramatize*^{V}).[13]

[12] It seems that formal criteria may be more easily applicable or provide dissimilar results for various other languages, for the characteristics that conversion has in each language.

[13] Example taken from Kiparsky (1982: 5).

However, this criterion for the identification of "zero derivation relations" is not applicable in all cases. This is because, as noted by Sanders (1988: 167), it may be the case that various analogues are found and "[…] that one analogy suggests that function A is derived from B and another analogy that function B is derived from A", e.g.:[14]

(3) a. *cover*^{N} > *cover*^{V}
'put cover(s) on'
chain^{N} > *enchain*^{V}
'put chains on'

b. *cover*^{V} > *cover*^{N}
'instrument for covering'
cleave^{V} > *cleaver*^{N}
'instrument for cleaving'

In cases like (3), the overt analogue criterion is not useful for the identification of directionality between the lexemes involved. This is because analogous pairs for which a Noun-to-Verb direction (3a) or a Verb-to-Noun direction (3b) can be found in the English language, and it remains unclear too how strong the parallelism with overt derivations must be to claim a specific directionality. Furthermore, overt derivation analogues do not seem to cover all the meanings or patterns identified in conversion (Sanders 1988: 168), i.e. sometimes no overt parallel cases are found at all.

I agree, thus, with the claim that even though the overt analogue criterion "[…] can be appropriately construed as a useful heuristic principle and even as a sufficient condition for the recognition of zero derivation relations, it cannot be construed as a necessary condition for the recognition of such relations in all cases" (Sanders 1988: 156, 171). Sanders also agrees that the Overt Analogue Criterion is incomplete, because semantic and pragmatic relations are not considered.

When analogues do not offer conclusive results, Sanders (1988: 171–174) mentions other possible criteria for recognizing zero-derivation relations:

i. diachrony, specifically, whether one of the functions precedes the other in history, but he mentions precedence in the process of language acquisition by individual speakers too, and recognizes the problems of such an approach for justifying synchronic analyses (1988: 171),

[14] Example (6) is adapted from Sanders (1988: 167).

ii. markedness relations, according to which "[…] a typologically marked function of a word would always be taken to be derived from the corresponding unmarked function of a word" (1988: 72), e.g. languages other than English seem to have *bottle*^{N} but not *bottle*^{V}, or the verbal counterpart is marked, e.g. Sp. *botella* ('*bottle*'^{N}) and the corresponding verb marked by derivation *embotellar* ('*bottle*'^{V}), although admittedly further research is needed in this respect, and
iii. what Sanders (1988: 173–174) refers to as "some sort of dependence criterion" or a criterion of "semantic-pragmatic dependence", based on Marchand (1969, cf. Section 2.5.6 in this thesis), which, in fact, he considers to be crucial. Although Sanders recognizes the latter criterion as "complex" in application, e.g. because of the possibility of relations of mutual dependence between the lexemes involved, it being difficult to ascertain one direction of dependence in all cases, the author still emphasizes its usefulness where the Overt Analogue Criterion fails to give any results about derivational relatedness.

2.5.5 Contextual or paradigmatic criteria

Various contextual or syntactic aspects have often been used in the literature for the identification of directionality in some cases, specifically:

i. inflectional paradigms: It is typically accepted that, if a verb is irregular and the corresponding noun is regular, the verb is the base of the process, e.g. *find*^{V} > *find*^{N}; if the noun is irregular and the verb is regular, then the noun is the base, e.g. *man*^{N} > *man*^{V} (cf. Myers 1984: 58; Kiparsky 1997; or the description in Cetnarowska 1993 or Plag 2003, among others; see also Don 2004 for Dutch; Rodrigues 2009 for Portuguese; or Tribout 2020 for French, where its applicability seems limited). This criterion does not apply to all cases of conversion in English. Furthermore, it has limited applicability as regards new formations, which tend to be regular (Cetnarowska 1993: 36, and references therein), so it would apply best in the study of older conversions,
ii. syntactic environment: Similarly, syntax has been used to ascertain directionality on the observation that derivatives by conversion may retain features of the base lexeme or inherit its argument structure or valency. For instance, Ginzburg et al. (1979) and Kilby (1984), as described in Cetnarowska (1993: 33–34), claim that a noun can be

regarded as deverbal when it occurs with modifying noun phrases which represent the subject or the object of the activity, e.g. *John **visited** his friends* > *John's **visit** to his friends*. Other authors who have looked at the argument structure or the valency of verbs and nouns and have described that derivatives may reflect the bases' argument realization are, among others, Grimshaw (1990), Rappaport Hovav & Levin (1998), Alexiadou & Grimshaw (2008), Iordăchioaia (2019), with a focus on nominalizations from particle verbs of the type *to bail out* > *the bailout*, Iordăchioaia et al. (2020) and also, specifically in relation to the issue of directionality, Ševčíková (2021), which considers valency alongside other criteria. However, the applicability of this criterion is limited (Cetnarowska 1993: 33). Interestingly, Ševčíková (2021: 114) claims that the division in the interpretation of nouns with valency frame as deverbal and those with lack of valency frame as the reverse "[…] is not intuitively acceptable with many of the nouns". The reasons refer to shifts in the meaning of the nouns, the choice of a specific theory, or the limited coverage of the valency dictionary used in her study, and

iii. derivational paradigms: The role of the derivational relations or paradigms formed for each of the lexemes has also been emphasized. This approach considers that the lexeme that gives rise to a larger number of derivatives by affixation is the base. The main drawback here, as noted in Cetnarowska (1993: 32), is that some affixes can attach to both nominal and verbal bases. Thus, *-y* can form denominal adjectives with the sense 'full of N, abounding in N, characterized by N', e.g. *hairy*, as well as deverbal adjectives with the meaning 'inclined or apt to V' e.g. *sticky* (Marchand 1969: 352, in Cetnarowska 1993: 32). Interestingly, Cetnarowska (1993: 32) notes that, in order to determine the directionality of the process where suffixes can attach to several bases, "[…] it may be necessary to consider in detail the semantic interpretation of the derivative". Note also that some conversion pairs may not have any derivatives at all (Adams: 1973: 38), hindering the identification of directionality by this method.

2.5.6 Semantic criteria

The semantic criteria used in the literature are typically those described by Marchand (1963a, 1963b, 1964, 1969) as *content criteria*:[15]

i. semantic dependence (hereafter, SD): Marchand (1964: 12) claims that "[t]he word that for its analysis is dependent on the content of the other pair member is necessarily the derivative", e.g. the verb *saw* is analysed as denominal because it uses the content of the noun in its definition (*saw*^{N} 'a cutting instrument with a blade, having a continuous series of teeth on the edge' > *saw*^{V} 'to cut with a saw, use a saw'). Similarly, in the case of *whistle* (*whistle*^{N} 'instrument used for whistling' < *whistle*^{V} 'forcing the breath through the teeth or compressed lips'), the noun is analysed as deverbal because the verb does not use the contents of the noun for its definition while the noun does use the contents of the verb. SD is taken as the most relevant criterion to define directionality between unmarked terms by Marchand, who claimed that "[t]he most important [criterion] is that of semantic dependence, as it is as often as not sufficient in itself to solve the question of derivational relationship while the other criteria have a more or less concomitant character" (Marchand 1964: 10). Similar claims can be found in the literature (cf. Quirk et al. 1985: 1558; Cetnarowska 1993: 24–25; Iacobini 2000: 870, where SD and SR are the two most relevant criteria). For instance, Quirk et al. (1985: 1558) emphasize their treatment of conversion as a process now available for extending the lexical resources of a language, by claiming that "[…] often the semantic dependence of one item upon another is sufficient ground for arguing its derivational dependence", and show this with paraphrases,

ii. restriction of usage (hereafter, RU): Marchand (1964: 13) claims that "[i]f one word has a smaller range of usage than its pair member, it must be considered the derivative" and lists various possibilities of restrictions of usage:
    1. one of the words is not generally accepted while the other is common, e.g. *author*^{N} is generally used, while the counterpart *author*^{V} is not so widely used,

[15] This thesis refers to Marchand's content criteria as "semantic criteria". The examples in this section are taken from Marchand (1964).

2. the use of one of the pair words is restricted to certain nominal or verbal forms, while the other pair word does not show any restrictions of usage, e.g. *amend*^{N}, which Marchand mentions as taking only plural form and in the phrase *make amends*, while its counterpart *amend*^{V} shows no restrictions,
3. one of the terms is used only as a half-serious word, while the other is unrestricted, e.g. *burgle*^{V} (semifacetous word) < *burglar*^{N}, and
4. one of the words is restricted to literary or poetic usage, while the counterpart is used generally or colloquially, e.g. *hunger*^{V} < *hunger*^{N}.

iii. semantic range (hereafter, SR): Marchand (1964: 14) observes that "[o]f two homophonous words exhibiting similar sets of semantic features the one with the smaller field of reference is the derivative". This implies that the lexeme with the more specific meaning is the derivative, as it is typically assumed that only some of the senses of the base are converted, or that a converted lexeme does not carry with it the semantic range it had in the word-class category from which it is converted (cf. Quirk et al. 1985: 1560), e.g. *cheat*^{V} > *cheat*^{N}, the noun meaning 'one who cheats (habitually)', while the verb does not mean 'to be a habitual cheat', and

iv. semantic pattern (hereafter, SP): Marchand (1964: 15) claims that "[c]ertain words have characteristic meanings which mark them as derivatives". The author lists a series of sense group characteristics of deverbal (e.g. *cheat*^{N} 'one who cheats (habitually)' < *cheat*^{V}) and denominal derivatives (e.g. *baby*^{V} 'treat as a baby' < *baby*^{N}; further groups are also exemplified in his 1963a paper; cf. also the sense groups in Marchand 1969).

Note that Marchand (1964: 13) highlights the fact that one word having a smaller range of usage than its pair member may be expressed in terms of frequency too. This observation has led other authors to study directionality in conversion based on the frequency of the pairs involved (cf. Section 2.5.7).

The relevance of these semantic criteria as well as other criteria typically proposed for directionality have been discussed in the literature (cf., among others, Trnka 1969; Aronoff 1976; Cetnarowska 1993; Katamba 1993; Rainer 1993; Plag 1999, 2003; Iacobini 2000; Balteiro 2007; or Bram 2011). However, these criteria were not put to test until quite recently, when some authors have used semantic criteria in their analyses of directionality, alone or in combination with other criteria.

For instance, Balteiro (2007), although regarding etymological information as primary in her analysis, uses semantic criteria too, SD, SR, SP and frequency of occurrence (which she names RU). She argues that, although SD solves 95% of cases, this should be taken with caution (2007: 124) for two reasons:

i. this criterion does not differentiate conversion from what is not, and
ii. this criterion does not allow to differentiate senses that were transferred at the time of the conversion and those acquired later by sense influence, which is irrelevant synchronically anyway.

SP has very similar results to SD. However, the criteria are applied at the level of lexeme, and not of sense, while a bidirectional or unidirectional label is assigned to each pair based on the OED. Balteiro's application of the criteria, specifically of SR, remains unclear. It seems that for SR, the author looks at senses in dictionaries, but the method is not described in detail, even if she acknowledges the difficulties in the analysis of SR in several cases.

Bram (2011) uses attestation dates (AD) as the criterion to set the direction in conversion and then tests frequency (in various corpora) and semantic criteria too to see if the indicated directionality correlates to the one provided by diachronic criteria. The semantic criteria studied (SD, SR) are applied at the level of lexeme, as only core or central senses are considered. These criteria seem to give limited results, and their correlations are below the 75% cut-off point they establish. For instance, the correlation found in Bram's study between the criteria AD/SD is 32.7% for Verb-to-Noun conversion, 53.7% for Noun-to-Verb with different dates, and 73.3% for Noun-to-Verb with the same dates; the correlation between AD/SR is of 70.5% for Verb-to-Noun conversion, 45.1% for Noun-to-Verb with different dates and 63.8% for Noun-to-Verb with the same dates.

However, I argue that attestation dates should be discarded in a synchronic approach to language description, and that, as languages are constantly changing, new senses may emerge and the directions between pairs may change too. Probably the fact that a synchronic and a diachronic approach are combined, or that the criteria are tested at the level of lexeme justify Bram's view that the criteria have limited results. Also, when attestation dates or etymological information is used regardless of senses, the possibility of the direction between pairs being reverted is overlooked (e.g. there may be cases for which original senses are no longer in use).

Kisselew et al. (2016) also investigate the question whether distributional information on the semantic specificity of the terms and their frequency can predict the direction in noun/verb pairs. Again, they take historical precedence as the standard of directionality and then consider frequency and semantics, while these criteria are tested at the level of lexeme too.

On a sample of French conversion, Tribout (2020) tests the criterion of SP, together with other diachronic and formal criteria. Regarding the analysis of SP, which is also applied at the level of lexeme, the author concludes that, except for the privative pattern, which can only be found in Noun-to-Verb conversion, SP does not allow for the identification of directionality in conversion, because all the semantic categories have counterparts in the opposite direction (Tribout 2020: 200).

More recently, Ševčíková (2021) looked at semantic dependency, together with other criteria such as morphographemic alternations, noun valency, and the number of verbs for each noun in a sample of Czech. Ševčíková observes differences between suffixless nouns in Czech expressing (non-)actional semantics arguing for two different groups: one based on a verbal root, and one based on a base noun or nominal root.

Other studies with a focus on various aspects of conversion use semantic criteria for the classification of directionality too, even when the focus is not on directionality. For instance, Valera (2014) notes that certain authors use the semantic criteria to tell directionality when providing examples in their description of conversion. Similarly, Bauer & Valera (2015), Valera (2020 on semantic patterns by senses in noun/verb conversion in English), and Valera (2023: 162 on the semantics of noun/verb conversion in English and Spanish), or Díaz-Negrillo & Fernández-Alcaina (2023 on the semantic distribution of low-frequency denominal verb formations in English), all assess directionality based on semantic dependency. Iordăchioaia et al.'s (2020) study of zero nominals (from manner and result verbs) looks at semantic readings, together with attestation dates and etymological information, stress shift, and their frequency in the OED, to identify the extent to which nominals realize argument structure, or block stress shift, and they investigate the various readings of the nouns associated with the base MANNER and RESULT verbs.

The advantage of semantic criteria is that they can be applied systematically to most cases, while being less subjective than an approach to

the pairs based solely on the speaker's intuition. This is because dictionaries or similar sources and widely accepted semantic classifications are typically used to test these criteria. These criteria also have the advantage of typically corresponding to the speaker's intuitions. However, as noted by Sanders (1988: 174) "[i]t remains to be determined […] to what extent this criterion of semantic-pragmatic dependency can be generalized to less clear and less prototypical cases of multiple function and thus to what extent it can serve […] as an appropriate basis for the recognition of zero derivation relations in all languages".

The main drawbacks of a synchronic approach to the semantics of pairs related by conversion are that the semantic criteria proposed in the literature are not always clearly or consistently applied, and that the synchronic approach is more time-consuming as compared to others (at least when applied at the level of sense). It must also be mentioned that lexicographic information may sometimes be inconclusive or misleading, and that different resources may represent lexemes and their senses differently.

The difficulty in the application of the criteria has been recognized by most authors, and the added difficulty of considering senses has been mentioned too (e.g. Valera 2015: 328). This is partly for the polysemy of the lexemes involved and partly because of the mutual dependence sometimes found between the pairs, it being difficult to establish a unique direction in some cases, i.e. a noun may be semantically dependent on the verb, and the verb may be semantically dependent on the noun as regards their definitions, e.g. *saw*^{V} has been claimed to be definable as 'the instrument prototypically used for sawing things' and *saw*^{N} as 'to cut with a saw' (Sanders 1988: 174, cf. also Katamba 1993: 120). Even more, it has been claimed that "[…] we can adjust the definition of semantically-related words in accordance with our intentions" (cf. Štekauer 1996: 128), and thus lack objectivity (Umbreit 2010: 310).

2.5.7 Quantitative-distributional criteria

Last, some authors have pointed to quantitative-distributional criteria for the identification of the base and derived term in a conversion pair. These criteria are based on measurable frequency of occurrence or register distribution data. The assumption is that the base is more frequent or occurs more generally (in

a larger number of registers) than the derivative (cf. Marchand 1963a, 1964; Bybee 1985, 1988: 133–134; Plag 2003).

Some authors have studied the frequency of lexemes to identify directionality between formally identical pairs in combination with other criteria (among others, Balteiro 2007; Bram 2011; Kisselew et al. 2016). However, as far as we know, this criterion has not been applied at the level of sense, partly for the difficulty of classifying polysemous pairs semantically, and because this information cannot be extracted from corpora easily.[16]

Balteiro, for instance, uses a relatively small corpus, *The International Corpus of English* (ICE), with about one million words, to measure frequency differences between pairs at the level of lexeme. She admits that her corpus size is a problem, and a larger dataset should be analysed (Balteiro 2007: 129).

Bram (2011) retrieves frequency data from various corpora, specifically, the *Brown Corpus*, the BNC and *Lancaster-Oslo/Bergen* (LOB) Corpus, to measure the agreement between the directions provided by attestation dates and by the frequency of the pairs in various corpora. As is natural, more pairs are found in the larger corpora, the BNC. The frequency is, however, also established at the level of lexeme.

Kisselew et al. (2016) also measure frequency at the level of lexeme in two large corpora, the BNC and ukWaC. Interestingly, both Bram (2011) and Kisselew et al (2016: 97) establish frequency as a poor predictor of directionality for Verb-to-Noun conversion.

The advantage of these criteria is that they are empirical, measurable, and objective, while they require data from sources such as corpora. Such criteria, however, may present several issues in application. At a general level, as mentioned by Štekauer (1996: 129), frequency depends on the sources used, the corpus to analyse conversion pairs should thus be representative and large enough to offer reliable results, and it should include texts from a variety of registers for differences in usage to be found. The same applies when considering register usage.

It should be noted that, when considering the frequency of occurrence of a pair of lexemes, unrelated uses (mistakes and homonyms) should be discarded first. Moreover, it is relevant to mind the various senses that the

[16] Although not on directionality, Lara-Clares' (2019; 2023) study is relevant methodologically as it looks at the meaning, frequency, and register distribution in a sample of nominal competition in English.

pairs may present. Thus, I argue that the results of any study which has not considered these issues are inconclusive. Indeed, other authors have admittedly not included the criterion of frequency of occurrence in their data analyses for the difficulties in its application. For instance, Ševčíková (2021: 107) does not apply the criterion of frequency of occurrence because the corpus used in her study, SYN2015, "[…] is not disambiguated for word senses and the frequency scores extracted would necessarily relate to all senses of polysemous items, which would make an adequate analysis impossible". More specific issues may appear too, e.g. when two pairs, or their senses, have a very low frequency of occurrence, or when their frequency of occurrence is very close. In such cases, directionality cannot be decided.

More generally, the frequency of occurrence or register usage data may not reflect the synchronic state of the language, or the actual directionality, as extralinguistic factors may play a role in the frequency or register use of the terms. In this regard, it has also been mentioned that frequency can change over time (Umbreit 2010: 309) but I argue that directionality can change too. For these reasons, frequency has been regarded as having only limited reliability.

2.5.8 Recapitulation

This section describes the criteria available in the literature to tell directionality in conversion:

i. the diachronic criteria of attestation dates and etymological information from dictionaries to determine the chronological priority of the pair members were presented in Section 2.5.1,
ii. the proposal to rely on speaker intuition to decide which pair member is base was discussed in Section 2.5.2,
iii. criteria based on morphological and phonological aspects between the pairs such as phonological aspects, stress shift, or the morphologic type and type distribution of the lexemes were described in Section 2.5.3,
iv. a structural criterion consisting in finding parallel cases in overt derivation was presented in Section 2.5.4,
v. contextual (syntactic) or paradigmatic criteria to identify directionality were examined in Section 2.5.5. Specifically, authors have considered (ir-)regularities in the inflectional paradigm of the pairs, and their syntax

to determine if the lexemes have e.g. inherited the argument structure or valency from the other member of the pair, and the word families or derivational paradigms emerging for each of the lexemes,

vi. a synchronic semantic approach proposing to rely on semantic evidence to determine the directionality in conversion pairs was considered in Section 2.5.6. Specifically, the criteria proposed are to look at the semantic dependence between the lexemes, their semantic range, whether they show restrictions in usage, or whether they use semantic patterns typically identified for each of the pairs, and

vii. the quantitative criteria relying on the frequency of the lexemes or their register usage in corpora are presented in Section 2.5.7.

As described in Sections 2.5.1–2.5.7, the criteria discussed in this chapter are not without problems. When approaching directionality, authors have either focused on a single criterion, e.g. Biese (1941), who relies on attestation dates in the OED, or they have used a combination of criteria from various approaches (see "mixture-based" approach in Bram 2011: 88 et passim). In fact, some authors have argued that using a combination of various criteria to determine directionality is more advantageous because it can capture the complexity of conversion and account for various aspects of the process. As noted, however, when a combination of criteria has been used, authors seem to prioritize one of the criteria over the others.

It is here argued, however, that a mixed approach may not resolve ambiguous or controversial cases, where evidence from various criteria may indicate opposite directions or be inconclusive. Although approaching the directionality in conversion by using both synchronic and diachronic criteria will capture the complexity of the process, the linguist should first decide where their interest lies and decide which criteria to use accordingly: in a diachronic approach (i.e. in the historical precedence of the terms) or in a synchronic account to language description (with a focus on directionality as perceived today, or on the semantic patterns involved in conversion). It has been emphasized that a diachronic analysis of conversion is sometimes against present-day intuition and usage of the terms (e.g. Cetnarowska 1993: 24).

Remarkably, previous studies on directionality seem to have approached the issue at the level of lexeme. This is here argued to affect the results in the sense that, as is widely acknowledged, the senses involved

between pairs of derivationally-related lexemes, by conversion or otherwise, may develop differently, or senses already created may influence one another, thus, various relations between the senses may be overlooked by an analysis of directionality at the level of lexeme (by considering just the most central or core sense for each lexeme of the conversion pairs).

In this thesis, a synchronic approach to the issue of directionality in conversion is taken, as the interest lies here in the sense relations between the terms in present-day English, and specifically, in the applicability of various synchronic criteria at the level of sense.

2.6 SUMMARY

Several issues surround the description of conversion in English, among others:

i. which term to use to refer to conversion,
ii. where to include it in the description of English, and
iii. how to tell directionality.

Various terms have been proposed, linked to the various approaches that describe conversion either:

i. as a word-formation process (e.g. the terms *conversion* or *zero-derivation*), or
iii. outside word formation (e.g. the terms *lexical relisting*, *multifunctionality*, or *underspecification*).

This review emphasizes that a synchronic analysis of directionality is initially compatible with most approaches to conversion (unless only one lexeme is hypothesized) and may prove relevant whether conversion is perceived as a word-formation process, or otherwise. Specifically, this thesis approaches conversion as a dynamic or asymmetrical process that results in the creation of new lexemes (and of new senses in a pair of lexemes). Because canonical noun/verb conversion pairs are the focus of this thesis, the conditions for canonical conversion as understood in this thesis were outlined: It involves two lexemes that belong to two different word-classes, which are formally identical, morphologically related, semantically related, and there is directionality between the lexemes or their senses.

The review chapter focuses on directionality. This issue remains unresolved in present-day English. There is a debate surrounding the need to establish directionality, which is given different degrees of importance in the literature:

i. directionality has no relevance within approaches that describe conversion as multifunctionality or underspecification, or also to those who claim directionality is an irrelevant issue synchronically,
ii. an analysis of conversion as bi-directional or multi-directional recognizes directionality while asserting that it is unpredictable, and authors who focus on irregularities in the lexicon or the polysemy involved agree that it is difficult to determine, and
iii. directionality is allowed, especially within approaches that regard conversion as a lexeme-creation process, and it is treated either as secondary or as the main object of study.

Under iii. above, directionality is typically controversial, partly because of the formal properties of the process, and also because contradictions are found in the literature on how to tell directionality. The following criteria are mentioned by various researchers:

i. historical criteria,
ii. intuitive criteria,
iii. morphological and phonological criteria,
iv. structural criteria,
v. contextual or paradigmatic criteria,
vi. semantic criteria, and
vii. external quantitative criteria.

The various criteria listed above are used in the literature alone or in combination to identify directionality and prove difficult to apply. This is partly because synchronic and diachronic criteria address different phenomena and give different results too, and partly because of the level of application of the criteria, i.e. at the level of lexeme vs sense.

CHAPTER 3

METHOD

3.1 INTRODUCTION

Chapter 3 is a description of the methods used for the study of directionality in this thesis. The chapter is divided into three subsections, the latter two are longer because, as mentioned in Chapter 1, the experimental component of this thesis is made up of two studies on directionality, specifically:

i. Section 3.2 presents the main resources used for the study of directionality in this thesis, specifically:
   i) the OED, and
   ii) the BNC.
ii. Section 3.3 describes the method used in a pilot study aiming to test how accurate the criteria described to determine directionality are when applied to a sample of affixation.[17] A brief account of the main findings of the study, regarding the applicability of the criteria, and their implications for the study on directionality in conversion is provided in this section.
iii. Section 3.4 describes the method used for the study on the applicability of the criteria for directionality in a sample of present-day English noun/verb conversion, which is the focus of this thesis.

[17] Cf. Ruz & Cetnarowska (2023).

3.2 RESOURCES: DICTIONARY AND CORPUS

This thesis relies on two main resources for data collection:

i. OED2 and OED3,[18] and
ii. BNC.

The OED is the data source of this thesis for retrieval of semantic information because it is the main lexicographical reference of the English language. The work on the dictionary started more than 150 years ago, and nowadays the OED offers a detailed account of the history, meaning and usage of over 500,000 words and phrases from across the English-speaking world.[19] It provides historical information and includes obsolete senses, which may prove relevant for proper understanding of the connections within the words and word families under study, and also synchronic information and senses that are in use in present-day English, the dictionary being revised and extended at regular intervals. The OED is used for two main purposes:

i. In the pilot study (Section 3.3), for the collection of derivatives by affixation, and
ii. both in the pilot study on affixation (Section 3.3) and the study on conversion (Section 3.4), as a source of semantic information, specifically for the study and classification of the senses associated with the lexemes under study (see Section 3.4.3 for specification of how sense classification was carried out). The use of other dictionaries was discarded, unless strictly necessary for senses not represented in the OED, to avoid a biased representation of the senses of each word.

This thesis combines the use of dictionary and corpus data. Corpora can store large amounts of data and are a useful source for the study of language use. The corpus used in this thesis is the BNC (Davies 2004–), a ca. 100-million-word database of spoken and written English of the late twentieth century (1960–1993).[20]

The BNC consists of texts from a variety of sources and registers (see Sections 3.3.2.6 and 3.4.4.6 for specification of how register information was

[18] OED2 refers to the second edition of the dictionary, published in 1989, and OED3 refers to the third edition, which is an ongoing project that began in the 1990s. Updates adding new or revised words are published quarterly as part of the OED3.
[19] Cf. https://www.oed.com/information/about-the-oed?tl=true
[20] Cf. https://www.sketchengine.eu/british-national-corpus-bnc/

considered in the studies of directionality on affixation and conversion, respectively). It is considered large enough to be used as a representative sample of synchronic English use, and yet a manageable source of data compared with larger corpora, such as the *Corpus of Contemporary American English* (COCA). These two properties are relevant because this piece of research on the applicability of the criteria on conversion entails analysis of the concordances for a sample of lexemes by senses (Section 3.4). Also, the BNC has the advantage that it is a static corpus. Although a regularly updated corpus would allow the inclusion of neologisms and recent uses of words, this could also distort the results, as regards the usage of lexemes or their inclusion.

The BNC is used in this thesis to collect all the concordances available of the lexemes in the data sample described in Section 3.4 for research on their semantics according to the senses represented, their register use, and their frequency of occurrence. The data were collected with *Sketchengine*,[21] and the BNC version selected was the version using English CLAWS5.[22] This version was selected after manual checking of a random sample of lexemes in the two versions available in *Sketchengine*, because the overall frequency of the terms checked was closer to the one provided by the frequency list of *CQPWeb*,[23] also by UCREL, which is the basis for collection of the conversion sample (Section 3.4.1). While the data in both versions still differed from those in the frequency list, no major differences in terms of frequency of occurrence were found in the analysis of the lexemes in any of the two versions available.

3.3 PILOT STUDY: DIRECTIONALITY IN AFFIXATION

The pilot study presented in this section tests Marchand's (1964) directionality criteria in a sample of word-class changing affixation in English,[24] with the following aims:

[21] Cf. https://www.sketchengine.eu
[22] Cf. https://www.sketchengine.eu/english-claws5-part-of-speech-tagset/
[23] Cf. https://cqpweb.lancs.ac.uk
[24] This makes sense in a framework where affixation and conversion are parallel processes in the sense that both are asymmetrical and have similar functionalities.

i. to test whether Marchand's (1964) semantic criteria for directionality, as well as the criteria of frequency of occurrence or register distribution data prove applicable outside conversion, and
ii. to test how measurable the criteria are at the scale of senses, e.g. how true it is for a base to show fewer restrictions of usage than its derivatives.

A test of Marchand's criteria in a sample of affixation in English as part of this thesis finds justification in that conversion has often been described by analogy to other word-formation processes, mainly to affixation. However, it remains unclear whether word formation by affixation and by conversion will react to directionality tests similarly or not. More importantly, a pilot test on affixation will also reveal how accurately the criteria in question ascertain directionality, within a control sample in which directionality is, in principle, indicated explicitly by the addition of a formal mark.

The (non-)applicability of the criteria brings forward various possibilities yet to be studied, each with consequences for the description of English word formation today and, in particular, for the status of conversion:

1. If the criteria prove applicable in affixation, they may be expected to be applicable in conversion too, at least under a view that conversion and affixation may have similar functionalities in language and produce output of similar semantic categories.
2. If the criteria do not prove applicable in affixation, it may then be expected that these criteria would neither be applicable in conversion, which settles the question as regards the source at issue.

The pilot study is also expected to help in the identification of potential problems in the method used for the analysis of the criteria which may be present in the study of directionality in conversion too, i.e. it becomes a methodological study. Section 3.3 is structured as follows:

i. Section 3.3.1 describes the method used for the data collection and selection as a sample of bases and their derivatives by affixation.
ii. Section 3.3.2 presents a description and exemplification of the analysis of the directionality criteria in the affixation sample.
iii. Section 3.3.3 discusses the main results obtained from the study regarding the applicability of the criteria in affixation.
iv. Section 3.3.4 summarizes the findings and their implications for the study of directionality in unclear cases.

3.3.1 Data sample collection and selection

The data sample taken in this pilot study starts out from 30 underived bases: ten nouns, ten verbs, and ten adjectives (see Table 3.3.1 below). These bases selected were classified as simple words in 40 European languages by participants in an international research project with a focus on cross-linguistic derivational networks (*Projekt Monika*, cf. Körtvélyessy et al. 2020, specifically Popova 2020 on English).

The derivational paradigms by word-class changing affixation were extracted for each base to obtain bases and derivatives with profiles like the ones found between converted pairs, i.e. lexemes in a paronymic relation (cf. Cruse 1986: 130; see also Valera & Ruz 2021).

Regarding the notion of *derivational paradigm*, it is to be noted that Körtvélyessy et al. (2020) draw a distinction between *derivational network*, which is viewed as a system of complex words (arranged into orders of derivation) grouped around a single underived lexeme, and *derivational paradigm*, which is defined as a set of first-order derivatives from a given lexeme. Unlike Körtvélyessy et al. (2020), the term *derivational paradigm* is used here in a wider sense to refer to a "[…] series of related morphological forms which share a base or base type" (Bauer 1997: 245, cf. also Bauer 1983), or to a group of words sharing a common root (Beecher 2004: 17; Fernández-Domínguez et al. 2020: 4, among others).

Collection of the derivational paradigms by affixation relied on searches in both the BNC and the OED. For a full account of derivatives, a list of word-class changing derivational affixes based on Quirk et al. (1985) and Stockwell & Minkova (2001) was used (see Appendix A.3.3). [25] Specifically, derivatives were searched for in the BNC using the syntax **lemma** to retrieve derivation by prefixation and suffixation, and considering also vowel alternation where possible, e.g. *drink*^{V} > **dr*nk**. The list with all the possible derivatives for the lemmas thus obtained was filtered manually and contrasted with the lists of derivatives obtained from OED searches.

A sample of 317 derived lexemes was thus obtained. It must be noted that not all the derivatives occur both in the OED and in the BNC. Some

[25] For an unbiased analysis and, as the aim is to test the criteria for directionality in affixation, conversion is not included in the derivational paradigms and only word-class-changing affixation is considered.

derivatives are attested only in the OED (ca. 37%), other derivatives were found only in the BNC (ca. 4%) and, probably, certain senses or derivatives may not be attested in either source. Withal, a combination of these two sources is believed to build a fairly complete picture of the paradigms for the 30 bases considered. Table 3.3.1 shows the total number of derivatives by affixation per base.

Table 3.3.1. Number of derivatives by affixation per paradigm base

Nouns	**nDerivatives**	**Verbs**	**nDerivatives**	**Adjectives**	**nDerivatives**
bone	16	*burn*	8	*bad*	4
day	7	*cut*	10	*black*	11
dog	17	*dig*	8	*long*	12
eye	11	*drink*	16	*narrow*	7
fire	10	*give*	7	*new*	5
louse	9	*hold*	15	*old*	6
name	14	*know*	13	*straight*	9
stone	15	*pull*	5	*thick*	14
tooth	20	*sew*	5	*thin*	7
water	20	*throw*	7	*warm*	9
Totals	139		94		84

The criteria for directionality to be used in this thesis were then applied as described in Section 3.3.2.

3.3.2 Marchand's (1964) criteria in affixation

The criteria tested in the pilot study are described and exemplified in this section.[26] Based on the principle that lexical meaning must be studied by senses, some of the criteria rely on OED data,[27] specifically the criteria of SD (Section 3.3.2.1), RU (Section 3.3.2.2), SR (see Section 3.3.2.3), and SP (Section 3.3.2.4). Still, due to time limitations, the criteria of FO (3.3.2.5) and RR (3.3.2.6) and were studied in the pilot study at the level of lexemes, based on BNC data. Although the criteria are described in the previous chapter (Section 2.5), a brief description of each criterion as described by Marchand is given within each subsection.

[26] The semantic criteria are presented following the order in Marchand (1964) and are followed by the related criteria of FO and RR.
[27] The lexical meaning of the entries of the pilot study was last checked in the OED in October 2021.

3.3.2.1 Semantic dependence (SD)

For the criterion of SD, Marchand (1964: 12) claimed that "[t]he word that for its analysis is dependent on the content of the other pair member is necessarily the derivative", e.g. *knife*^{N} > *knife*^{V} 'to V with a *knife*'. In the pilot study, this criterion was measured based on OED data, by counting the total number of senses for each derivative showing SD or not. Specifically, Arabic-numbered senses were considered, and subsenses (represented by alphabetical letters, e.g. 2a, 2b, etc.) were used too, when relevant.

Table 3.3.2.1. SD in the paradigm of *bone*^{N} (OED) (nSenses: number of senses that each lexeme takes in the OED; +SD: senses showing SD; –SD: senses not showing SD; nSD: total number of senses showing SD). The numbers in columns *+SD*, *–SD*, and *?* are for the specific Arabic numbers of the senses for the lexemes as listed in the OED[28]

BASE	D1	D2	nSenses	+ SD	– SD	?	nSD
bone^{N}			22				
	boned^{ADJ}		3	1, 2, 3			3
	boneless^{ADJ}		3	1, 2		3	2
	boneless^{N}		* (1)				1
		bonelessly^{ADV}	1	1			1
		bonelessness^{N}	1	1			1
	bony^{ADJ}/*boney*^{ADJ}		3	1, 2		3	2
	bony^{N}		1	1			1
	bony^{V}		1	1			1
		bonily^{ADV}	- (1)				1
		boninness^{N}	1	1			1
	boning^{N}		4	1, 2, 3a		3b, 4	2.5
	boner^{N}		4	1, 2a	2b, 3	4	1.5
	boneish^{ADJ}		2	1, 2			2
	debone^{V}		1	1			1
		deboned^{ADJ}	2	1, 2			2
		deboning^{N}	1	1			1
Total			30				24

[28] Asterisks (*) indicate that no specific sense(s) are listed for a lexeme, e.g. *boneless*^{N}, which appears as a possibility as part of the entry *boneless*^{ADJ} and is not given a separate entry. A hyphen (-) in column *nSenses* means that the lexeme is not listed in the OED (but is attested in the BNC). A general sense is then used for counts in these cases.

Table 3.3.2.1 exemplifies the analysis of SD for the paradigm of *bone*[N]. Out of the total number of senses found for all the derivatives by affixation from *bone*[N] (n=30), 24 senses seem to show SD (e.g. *boneless*[ADJ] sense 1 in the OED "Having no bones; lacking bones", or *boned*[ADJ] sense 2 "Provided with bone or bones"). Note that, when synonyms were used for the description of the lexemes, the entries for the synonyms were checked and, if they referred to the original bases, the derivatives were analysed as showing SD towards the base too.

While most senses in this paradigm seem to satisfy the criterion of SD, subsense 2b and sense 3 for the derivative *boner*[N] in the OED are marked not to:

(4) *boner*[N], sense 2b
"2b. A cow of moderate to poor quality or condition whose meat is typically used for low-grade beef products. Frequently attributive."

(5) *boner*[N], sense 3
"3. slang (chiefly North American). A mistake, a blunder; frequently (and in earliest use) Sport (originally and chiefly Baseball) a poor decision or tactical error, esp. one that causes one's team to lose a game. Frequently in to pull a boner: to make a mistake. Cf. bonehead n. 1b."

In subsense 2b (4), the base is not mentioned in the definition in the dictionary and thus, a SD relation cannot be confidently claimed, even if a relation may be perceived by speakers. Sense 3 (5) seems to have emerged specifically for the derivative, as no related sense is found in the base.

Also, senses classified as *unclear* regarding whether they display SD towards the base or not are listed under column "*?*". For example, sense 3 for *boneless*[ADJ] (6) or sense 4 for *boner*[N] (7), because no clear reference to *bone*[N] is made.

(6) *boneless*[ADJ], sense 3
"3. Figurative. Lacking substance, solidity, or strength; (of a person) having little strength of character or willpower; lacking 'backbone'."

(7) *boner*[N], sense 4
"4. slang (originally U.S.). An erection of the penis. Hence figurative: a strong attraction to or state of excitement about something specified."

Sense 3 for *bony*^{ADJ} (8) was also classified as *unclear*: even if it refers to sense 12 in *bone*^{N} (9), sense 12 also refers to sense 3 of the adjective:

(8) *bony*^{ADJ}, sense 3
"3. U.S. Mining. Of coal: containing a considerable amount of slate or shale. Cf. bone n.1 12."

(9) *bone*^{N1}, sense 12
"12. Mining. Slaty or shaly material embedded in coal seams; coal containing such material. Cf. bony adj. 3."

3.3.2.2 Restrictions of usage (RU)

Regarding the criterion of RU, Marchand claimed that "[i]f one word has a smaller range of usage than its pair member, it must be considered the derivative" (1964: 13). Marchand listed various possibilities for RU (1969: 13–14), specifically:

i. for one of the words not to be generally accepted while the other is commonly used (RU1);
ii. for a word to be restricted to certain forms as one of the word classes, while it is not restricted as the other (RU2);
iii. for a word to be used as half serious or semifacetious (RU3); or
iv. to take a literary or poetic use (RU4).[29]

A more detailed description of each RU type can be found in Section 2.5.6.

In this pilot study, the criterion of RU was measured by counting the total number of senses showing any restrictions in the OED. Table 3.3.2.2 exemplifies the analysis of RU for the paradigm of *bone*^{N}.

As shown in the table, RU was divided into the various types mentioned (columns *RU1* to *RU4*) and later quantified as a whole for each lexeme (column *nRU*), which allows for a base-derivative comparison of RU. The numbers in columns *RU1* to *RU4* show OED's specific numbering of the

[29] Note that figurative and extended senses were initially listed down as RU (in column *RU4*, Table 3.3.2.2), but these were later quantified as restrictions in our analysis only in some cases, while in others they were considered special uses for the lexemes, typically widening the SR or scope of the derivatives. In other words, if a sense of a derivative contrasts with the base-related sense in that it can only be used figuratively, then it is here analysed as restricted, but if the derivative sense covers the use of the base sense and it can additionally take a figurative interpretation, then this is not counted as restricted (it would widen the possibility of use of the derivative sense).

senses presenting the restrictions specified in each column. Specifically for the paradigm of *bone*[N], many senses for the derivatives show RU of various types (n=17), but note that the base itself has a large number of senses which do show RU in use too (n=15).

Table 3.3.2.2. RU in the paradigm of *bone*[N] (OED)

BASE	D1	D2	nS	RU1	RU2	RU4	nRU
bone[N]			22	Hist./obs./rare: 3, 10, 18, 19b, 20, 21 Spec.: 5, 8b, 12 Slang: 11,14	Pl.: 5a, 7, 9, 16 (+coll.), 17 Mass n.: 8a	Fig.: 1c, 4b, 6, 9	15
	boned[ADJ]		3	Specific: 2		1 (+ fig.)	1
	boneless[ADJ]		3			Fig.: 3	1
	boneless[N]		* (1)				1
		bonelessly[ADV]	1			Figurative: 1	1
		bonelessness[N]	1				0
	bony[*ADJ]		3	Specific: 3 (U.S. Mining.)			1
	bony[N]		1	Specific: 1 (U.S. Mining.)			1
	bony[V]		1	Obsolete (+ nonce-word): 1			1
		bonily[ADV]	- (1)				0
		boninness[N]	1				0
	boning[N]		4	Specific: 1, 2, 3 Slang: 4	– Pl.		4
	boner[N]		4	Slang: 1, 3, 4			3
	boneish[ADJ]		2	Obsolete: 1			1
	debone[V]		1				0
		deboned[ADJ]	2	Specific, rare: 1			1
		deboning[N]	1	Specific: 1			1
Total			30		Total nRU (Der)		17

3.3.2.3 Semantic range (SR)

Regarding SR, Marchand (1964: 14) claimed that "[o]f two homophonous words exhibiting similar sets of semantic features the one with the smaller field of reference is the derivative", e.g. *convert*[V] > *convert*[N] 'one who has been converted to a religion/belief'. The criterion of SR is measured in the pilot study in two ways:

i. by comparison of the number of senses of each lexeme (Section 3.3.2.3.1), and
ii. qualitatively for the lexemes in the sample (Section 3.3.2.3.2).

3.3.2.3.1 Number of senses (nSen)

In relation to the criterion of SR, the number of senses (hereafter nSen) that each lexeme in the paradigms take was analysed. To this end, OED's numbered senses were noted down for subsequent base-derivative comparison.

Table 3.3.2.3.1. nSen for the lexemes in the paradigm of *bone*[N]

BASE	**D1**	**D2**	**nSen**
bone[N]			22
	boned[ADJ]		3
	boneless[ADJ]		3
	boneless[N]		* (1)
		bonelessly[ADV]	1
		bonelessness[N]	1
	*bony**[ADJ]		3
	bony[N]		1
	bony[V]		1
		bonily[ADV]	- (1)
		boninness[N]	1
	boning[N]		4
	boner[N]		4
	boneish[ADJ]		2
	debone[V]		1
		deboned[ADJ]	2
		deboning[N]	1
Total			30

In Table 3.3.2.3.1 for the paradigm of *bone*[N], the nSen that each lexeme takes according to the OED's description seems to confirm Marchand's (1964) hypothesis, i.e. the base of the paradigm typically takes a larger nSen than its derivatives in D1, and derivatives in D2 also seem to take a similar or lower

nSen than their bases in D1, even though this may not always be the case (e.g. *deboned*[ADJ]).[30] Issues emerging from the application of this test in the pilot study are discussed in Section 3.3.3.3.

3.3.2.3.2 Qualitative analysis of semantic range (SR)

In this pilot study, a qualitative analysis of the criterion of SR was carried out, partly for the issues arising from the comparison of OED's nSen (see Section 3.3.3.3). This analysis takes into account the senses for each lexeme and makes a qualitative interpretation for the SR covered by each lexeme in the paradigms. The SR for each lexeme compared to its base was marked as follows:

i. A question mark (*?*) indicates that the base-derivative SR comparison is unclear, either because a derivative is not listed in the OED (e.g. *bonily*[ADV]), or because no sense description is given and no SR comparison can be made. It is also used when the base of a derivative is unclear and when the derivative senses seem to derive from various bases (e.g. *deboned*[ADJ], its senses being described as from two different bases, *boned*[ADJ] and *debone*[V], cf. footnote 30). In the latter case, the results of SR comparison may differ according to the base with which the derivative is compared. Thus, the different senses for *deboned*[ADJ] are considered separately for the results, as is also specified within brackets in Table 3.3.2.3.2.
ii. (>) indicates that the SR of the derivatives is wider than the SR of the base, i.e. the derivatives seem to cover the SR of the base plus other senses too, e.g. *lousy*[ADJ].
iii. (≈) indicates that the SR of the derivatives is similar to the SR of their base. This includes:
    a. derivatives taking fairly equivalent senses to the ones in the base but with the semantic change associated with the change in word-class category, and for which specification or restrictions, if any, seem similar too, e.g. *dogginess*[N] "The quality or fact of being 'doggy' (in various senses); doggy nature. See doggy, adj.";

[30] However, the OED specifies two bases for the two senses in *deboned*[ADJ]: "In sense 1 < de- *prefix* + boned *adj.* In sense 2 < debone *v.* + -ed *suffix*[1]". This has an effect on the sense analysis of directionality. The OED senses for *deboned*[ADJ] are:
i. Sense 1 "Of a corset: not stiffened with whalebone. Cf. boned adj. 2a rare", and
ii. Sense 2 "Of meat or fish: that has had the bones removed".

b. derivatives described in the OED as taking a sense in all of the senses of the base, e.g. *giving*[ADJ] "That gives, in senses of the verb";
c. derivatives described using a SP typical of a derivative which seems to cover the SR of the base, e.g. *stonify*[V] "To make stony, or turn into stone; to petrify" > *stonifiable*[ADJ] "capable of being stonified"; or
d. derivatives for which no concrete definition is provided but their bases present a single sense, e.g. *stonified*[ADJ].

iv. (≲) indicates that the SR of the derivatives is slightly narrower or very similar to the SR of the base. This includes:
a. derivatives which seem to take the main senses of the base, but with the exclusion of very few specific or restricted senses or subsenses, e.g. *doggedness*[N]. While it is defined as "The quality or condition of being dogged", its Arabic numbered senses 1 and 2 refer to senses 1a, 1b, 1d in *dogged*[ADJ], while it is unclear if *doggedness*[N] may also apply to sense 1c or 2 of *dogged*[ADJ]:
- *doggedness*[N] sense 1 "†1. Malice, spitefulness, cruelty. Cf. DOGGED adj. 1a. Obs."
- *doggedness*[N] sense 2 "2. Originally: †bad temper, surliness, sullenness; sullen obstinacy (obs.). Now: persistence, stubbornness; resoluteness. Cf. DOGGED adj. 1b, *it's dogged as does it* at DOGGED adj. and adv. Phrases."
- *dogged*[ADJ] sense 1a "†a. In negative sense (of a person, action, etc.): having the bad qualities of a dog; malicious, spiteful, perverse; cruel. Obs."
- *dogged*[ADJ] sense 1b "b. In weakened use: ill-tempered, surly; sullen, morose. Now with some mixture of sense A. 1d: having an air of sullen obstinacy."
- *dogged*[ADJ] sense 1d "d. In neutral or positive sense: having the persistence or tenacity characteristic of some breeds of dog; obstinate, stubborn; resolute. (Now the usual sense.)"
- *dogged*[ADJ] sense 1c "†c. Of a thing: awkward, difficult to deal with. Obs."
- *dogged*[ADJ] sense 2 "†a. Having some other characteristic or habit of a dog; doglike. Obs. / b. Greedy, voracious, ravenous; = DOGGED adj. 1b. Esp. in dogged appetite, †dogged hunger. Also in figurative contexts. Now rare."

b. derivatives described in the OED as taking a sense "in various senses of the base" without specification, thus, it is unclear whether the SR of the derivative is similar to that of the base but with the changes associated with the word-class change, or narrower, e.g. *blackener*^{N} "A person who or thing that blackens (in various senses of blacken v.)".
c. derivatives which appear within a polysemous entry in the OED but for which no senses or restrictions are provided. It is thus assumed that the SR may be narrower or similar to that of the base, e.g. *delousing*$^{ADJ/N}$ in *delouse*^{V} or *stonelessness*^{N} in *stoneless*^{ADJ}.

v. (<) indicates that the SR of the derivatives is narrower than the SR of the base, the derivatives typically taking fewer senses, or for which senses are more specific or restricted, e.g. *drinky*^{ADJ} "Tipsy; drunk".

The qualitative analysis of the criterion of SR in the pilot study is exemplified in Table 3.3.2.3.2 for the paradigm of *bone*^{N}. The table shows that, overall, for the paradigm of *bone*^{N}, the SR of the derivatives seems to be significantly narrower (<), or slightly narrower or very similar to the SR of the base (≲), as explained in point iv) of Section 3.3.2.3.2 (note also hereafter, especially in Chapters 4 and 5).

It must be noted that, even if some lexemes may present new senses which are not in their base, they may still be analysed as taking a narrower SR than the base, e.g. because various senses of the base are not in the derivative. This is the case of *boner*^{N}, which presents new senses (2b and 3) but its overall SR still seems to be considerably narrower than that of the base (actually, the derivative's new senses seem to be more specific or restricted).

Table 3.3.2.3.2. SR in the paradigm of *bone*^{N} (OED) (≈: similar SR / >: wider SR / <: narrower SR / ≲: narrower/close to similar SR / ?: unclear)

BASE	D1	D2	SR	New/unrelated senses
bone^{N}				
	boned^{ADJ}		≲	
	boneless^{ADJ}		<	
	boneless^{N}		<	
		bonelessly^{ADV}	≲	
		bonelessness^{N}	≲	
	*bony**^{ADJ}		≲	
	bony^{N}		<	
	bony^{V}		<	
		bonily^{ADV}	?	
		boninness^{N}	≈	
	boning^{N}		<	
	boner^{N}		<	2b, 3
	boneish^{ADJ}		<	
	debone^{V}		<	
		deboned^{ADJ}	? (≈/<)	
		deboning^{N}	<	

3.3.2.4 Semantic Pattern (SP)

For the criterion of SP, Marchand (1964: 15) states that "[c]ertain words have characteristic meanings which mark them as derivatives", e.g. *father*^{V} 'to act as a father'. This criterion was measured in the pilot study by calculating the number of senses for each lexeme displaying a SP typical of a derivative (i.e. nSP), as in Table 3.3.2.4 for the paradigm of *bone*^{N}. Marchand (1969) lists a series of paraphrases for each affix which were used as reference to analyse this criterion. Table 3.3.2.4 exemplifies the analysis of the criterion of SP for the paradigm of *bone*^{N}, for which the number of senses for each lexeme displaying a SP typical of a derivative was noted down.

Table 3.3.2.4. SP in the paradigm of *bone*^{N} (OED)

BASE	D1	D2	nSenses	–SP/?	nSP
bone^{N}			22		
	boned^{ADJ}		3		3
	boneless^{ADJ}		3		3
	boneless^{N}		* (1)		1
		bonelessly^{ADV}	1		1
		bonelessness^{N}	1		1
	*bony**^{ADJ}		3		3
	bony^{N}		1	1	0
	bony^{V}		1		1
		bonily^{ADV}	- (1)		1
		boninness^{N}	1		1
	boning^{N}		4	3b	3.5
	boner^{N}		4	†1, 2b, 3, 4	0.5
	boneish^{ADJ}		2		2
	debone^{V}		1		1
		deboned^{ADJ}	2		2
		deboning^{N}	1		1
Total			30		25

Specifically for the paradigm of *bone*^{N}, it can be seen that a large number of senses (n=25) were found to take a SP typical of a derivative from the nominal base or the related base in D1. In some cases, no SP signalling the assumed derivative character of the senses is attested, as in *bony*^{N} (see example (8) in Section 3.3.2.1, repeated here as (10)). The related sense, *bone*^{N} (sense 12 in example (9) in Section 3.3.2.1, repeated here as (11)), is defined using the same wording as the definition for *bony*^{N}.

(10) *bony*^{ADJ}, sense 3
"3. U.S. Mining. Of coal: containing a considerable amount of slate or shale. Cf. bone n.1 12."

(11) *bone*^{N1}, sense 12
"12. Mining. Slaty or shaly material embedded in coal seams; coal containing such material. Cf. bony adj. 3."

Thus, no typical SP of a derivative is interpreted, and the two lexemes can be used to refer to the material.

3.3.2.5 Frequency of occurrence (FO)

Marchand (1964) also mentions frequency of occurrence (hereafter, *FO*) in relation to RU, in the sense that, if a word is less commonly used than its conversion counterpart, then, this may be expressed in terms of frequency, the less commonly used lexeme being less frequently used too. In this pilot study, FO is analysed as a separate, though clearly not unrelated, criterion. Specifically, the frequency of occurrence of bases and derivatives were compared so as to see if this criterion is applicable and indicates directionality correctly. It must be noted that FO was measured in this study at the level of lexeme, by a comparison of the normalized frequency (NF, here referring to the number of occurrences of a lexeme per million tokens) of bases and derivatives in the BNC, as shown in Table 3.3.2.5 for the paradigm of *bone*^{N}.

Table 3.3.2.5. Normalized frequency of occurrence per million tokens (NF) in the paradigm of *bone*^{N} (BNC) (blank cells are for unattested derivatives)

BASE	D1	D2	NF
bone^{N}			45.60
	boned^{ADJ}		0.33
	boneless^{ADJ}		0.46
	boneless^{N}		0.03
		bonelessly^{ADV}	0.02
		bonelessness^{N}	
	bony/boney*^{ADJ}		3.36
	bony^{N}		
	bony^{V}		
		bonily^{ADV}	0.02
		boninness^{N}	0.02
	boning^{N}		0.03
	boner^{N}		
	boneish^{ADJ}		
	debone^{V}		0.01
		deboned^{ADJ}	
		deboning^{N}	

In the paradigm of *bone*^{N}, the nominal base is found to be used far more frequently than any of its derivatives. Specifically, *bone*^{N} has a NF of 45.6, while its most frequent derivative, *bony*^{ADJ}, has a NF of 3.36. The rest of the derivatives show even lower frequencies. It is typical of lexemes in D1 to have a higher frequency than their derivatives in D2.

3.3.2.6 Range of registers (RR)

RR was measured in this pilot study as a quantitative criterion, partly also in relation to the criterion of SR and RU, under the assumption that, the smaller the semantic range of a lexeme, or the more specific or restricted the senses, the smaller their register use will be. To measure the range of registers covered by the lexemes, this pilot study considered the main categories into which the BNC is divided:

i. spoken (10.35%),
ii. fiction (16.53%),
iii. magazine (7.54%),
iv. newspaper (10.87%),
v. non-academic (17.14%),
vi. academic (15.93%), and
vii. miscellaneous texts (21.64%).[31]

This criterion was measured at the level of lexeme by a comparison of the number of registers (nReg) in which bases and derivatives appear in the BNC, as exemplified in Table 3.3.2.6 for the paradigm of *bone*^{N}.

The table shows that, specifically for the paradigm of *bone*^{N}, the nReg in which the base is used is typically wider than that of the derivative. This is true, e.g. for derivatives in D2 as compared to their bases in D1 (*bonelessly*^{ADV}, nReg = 1 from *boneless*^{ADJ}, nReg = 6). There are derivatives in D1, however, showing a similar register use to the base, e.g. *bony*^{ADJ} (nReg = 7).

[31] The number of words in the BNC categories is taken from the section *Texts* (cf. https://www.english-corpora.org/bnc).

Table 3.3.2.6. Register distribution in the paradigm of *bone*^{N} (BNC) (+: attested / −: not attested)

BASE	D1	D2	nReg	Spok	Fict	Magz	Newsp	N-Acad	Acad	Misc
bone^{N}			7	+	+	+	+	+	+	+
	boned^{ADJ}		6	+	+	+	+	+	−	+
	boneless^{ADJ}		6	+	+	+	+	+	−	+
	boneless^{N}		2	−	−	+	−	+	−	−
		bonelessly^{ADV}	1	−	+	−	−	−	−	−
		bonelessness^{N}		−	−	−	−	−	−	−
	*bony**^{ADJ}		7	+	+	+	+	+	+	+
	*boney**^{ADJ}		3	−	+	+	+	−	−	−
	bony^{N}			−	−	−	−	−	−	−
	bony^{V}			−	−	−	−	−	−	−
		bonily^{ADV}	2	−	+	+	−	−	−	−
		boniness^{N}	2	−	+	−	−	−	−	+
	boning^{N}		2	+	−	−	+	−	−	−
	boner^{N}			−	−	−	−	−	−	−
	boneish^{ADJ}			−	−	−	−	−	−	−
	debone^{V}		1	−	+	−	−	−	−	−
		deboned^{ADJ}		−	−	−	−	−	−	−
		deboning^{N}		−	−	−	−	−	−	−

3.3.3 Discussion of the overall results of the pilot study

Section 3.3.3 reviews briefly the results of the pilot study (for data analysis and a discussion, see Ruz & Cetnarowska 2023). This section focuses on whether the semantic criteria for directionality are applicable in affixation whether directionality is indeed predictable based on semantic analysis, and to which extent directionality criteria are applicable at the level of sense or lexeme. For easier reading, the discussion is provided by criterion: Section 3.3.3.1 focuses on the applicability of the criterion of SD, Section 3.3.3.2 on RU, Section 3.3.3.3 on SR, and Section 3.3.3.4 on SP, all based on OED data. Sections 3.3.3.5 and 3.3.3.6 are about FO and RR in the BNC, respectively.

3.3.3.1 Semantic dependence (SD)

Results of the pilot study show that the criterion of SD is applicable at the level of sense and useful in predicting the direction of derivation in affixation. It indicates the expected directionality (from the base to the formally more

complex lexeme) for a large part of the senses in the derivatives of the paradigms in this study, and more strongly for second- and third-order derivatives. This is probably because, the more complex the derivative, the fewer senses it seems to take, these being typically more specific and with a tendency to depend more directly on the meaning of the base. Not all senses in the derivatives show SD towards the base, and the degree to which SD indicates a base>derivative direction varies for each paradigm, and for each derivative, but the criterion is fulfilled for most senses in the derivatives and thus qualifies here for the study of directionality. A systematic assessment of instances in which a SD towards the base is not identified, or where various directions or patterns can be identified, may provide further information in this regard.

3.3.3.2 Restrictions of usage (RU)

The results of the pilot study show that the criterion of RU is applicable in affixation only for specific senses. While many of the senses for the derivatives are restricted, this cannot be taken as evidence of directionality without a detailed analysis of the senses of the base and its derivatives. This is because senses in the bases may be restricted, and these restrictions will most probably be passed on to the related derivative senses, regardless of whether the sense is basic in the simpler or in the more complex lexeme, or not. Only the identification of related senses which appear as restricted in one of the lexemes in a pair and as unrestricted in the other would prove useful for the study of directionality. Thus, it can be concluded that RU is applicable and relevant only at the level of sense, probably not offering conclusive results for an analysis of lexemes as a whole.

3.3.3.3 Semantic range (nSen and SR)

Regarding the criterion of SR, first, a comparison of the number of senses in the OED for lexemes in a pair showed that the percentage of lexemes in D1 with a lower number of senses than their base was higher than, e.g. lexemes in D2 as compared to their base in D1, which were more frequently found to display an equivalent number of senses. The difference in the number of senses was also found to be lower the more complex the derivative in terms of the number of affixes. Although a comparison of the number of senses alone, without any further considerations, is less time-consuming than the

qualitative analysis carried out, it does not prove useful in identifying directionality in affixation. Also, it poses difficulties in its applicability at the level of sense, among others:

i. the representation of senses in the OED is not always consistent, and
ii. the extent to which a difference in the number of senses between a pair, be it wider or narrower, may serve to indicate a difference in the SR of the lexemes is unclear.

It is here thus believed that SR for specific pairs may be more accurately described in a qualitative analysis.

The results of a qualitative analysis of SR seem to confirm that the senses in the derivatives typically show either a nearly similar SR or a significantly lower SR than the base but do not include all the senses in the base. Few or no cases were found in the pilot study in which the derivative SR was higher or similar to that of the base. Thus, SR seems applicable for the study of directionality by senses in affixation. This method, however, proved to be highly time-consuming. Also, the use of OED's semantic information complicated the analysis in terms of directionality, because it includes obsolete senses as well as rare, specific, or restricted senses.

This translates to the study of directionality in conversion in that only senses in use in the corpus are initially considered, and that a comparison of SR is carried out only based on a qualitative interpretation (see Section 3.4.5.3 for a more detailed description of the application of SR in the conversion sample).

3.3.3.4 Semantic pattern (SP)

The results of the pilot study show that the criterion of SP is applicable at the level of sense and is useful in predicting a direction in affixation too, confirming the base-to-derivative direction in line with the base hypothesis for a large part of the senses in the derivatives of the paradigms in this study. This is proportionately so the more complex a derivative is, similarly to the results of the criterion of SD. Again, it must be noted that not all senses in the derivatives show a SP typical of a derivative.

3.3.3.5 Frequency of occurrence (FO)

The pilot study shows that a study of FO by lexemes is applicable in affixation and seems to indicate the assumed directionality for most base-derivative pairs, the bases being typically more frequent than their derivatives in D1, D2, and D3. While it seems to offer results at the level of lexeme, it is here believed that considering FO by senses would be useful in identifying a directionality between lexemes in unclear cases, and in identifying pairs for which various directions of derivation may exist. Otherwise, more concrete results regarding FO (and RR), or identifying patterns of directionality in this respect are not possible here.

Also, the extent to which a difference in the frequency of occurrence within a pair may be relevant or not should be defined before undertaking a more accurate analysis of directionality based on FO in unclear cases.

3.3.3.6 Range of registers (RR)

The range of registers covered by a lexeme (RR) may also be taken as an indication of the semantic range (SR) of a lexeme for specific cases. It is linked to frequency and to polysemanticity, and the expectation is that the higher the number of senses of a lexeme or the wider its semantic range, the wider its frequency and register use will be too.

The results of the pilot study show that at least for lexemes as frequent as the ones in this study, RR does not prove to be as useful as regards directionality. This is because many bases and derivatives in our paradigm are widespread and, thus, many base-derivative pairs occur in all the registers in the BNC. Also, the results seem to vary from paradigm to paradigm, and by order of derivation. While it may seem to prove more useful when considering more complex derivatives, it is unclear whether this may just be related to a lower frequency of the lexemes or whether it indicates that the register use of those derivatives is narrower. To which extent a more exhaustive classification into registers or by senses may offer results for the directionality in affixation remains unclear.

3.3.4 Recapitulation: Implications for the study of directionality in conversion

The pilot study aimed to investigate Marchand's (1964) directionality criteria in a sample of word-class changing affixation in English in order to test if the

semantic criteria prove applicable outside conversion, and to determine how feasible it is to apply Marchand's semantic criteria at the level of sense and not of lexeme. An analysis of the criteria seems to indicate the following:

i. For most cases in our sample, both the criteria of SD and SP seem to indicate correctly a base>derivative direction of derivation. However, this is not true for every sense, and some variation is found across paradigms. Independently of the reasons why the criteria may not be satisfied in some cases, the same may happen for other word-formation processes, conversion included.
ii. The criterion of RU proves useful only at the level of sense on a base-derivative comparison, and only for specific cases. Similar applicability is expected to be found for the conversion sample.
iii. Most of the derivatives seem to take a narrower semantic range, but this is best measured qualitatively partly because of inconsistencies in the dictionary sense organization which make a quantitative analysis difficult, and the number of senses not always offering relevant results. Dictionary inconsistencies are expected for converted pairs too, which would make difficult the assessment of directionality based on their number of senses. A qualitative analysis may provide a better representation of the semantic range of the lexemes but is highly time-consuming. Thus, the criterion of SR will be tested in the conversion sample by a qualitative analysis of the senses in use in the BNC.
iv. The frequency of the derivatives is typically lower than that of their bases for the paradigms studied. Note that FO may serve as a useful diagnostic tool at the level of senses. Therefore, the study of directionality in conversion will consider FO at the level of sense. The issue to what extent and from which point a difference in frequency can be considered relevant is to be considered, which is particularly important for unclear cases, (cf. Section 3.4.5.5 for a description of how FO was analysed in the study of directionality criteria carried out in this thesis).
v. The criterion of RR may be a reliable test at the level of senses, and perhaps only if a more fine-grained division of registers is considered. The analysis of the number of registers per se is not always conclusive. In contrast, the study of directionality in conversion will consider RR at the level of sense. A more fine-grained analysis of RR, if relevant, will be considered too.

Overall, the pilot study confirms that an analysis by senses, although time-consuming, is desirable for polysemous pairs of lexemes (in line with Plank 2010). The results support the hypothesis that an analysis by senses may offer more accurate results regarding directionality, the semantic development of lexemes, and the patterns found between pairs and within derivational paradigms too.

3.4 METHODOLOGICAL PROCEDURES FOR THE STUDY OF DIRECTIONALITY IN CONVERSION

Section 3.4 describes the methodological procedure followed for the study of directionality in a sample of English noun/verb conversion, specifically:

i. Corpus selection and data sampling of formally identical and semantically related noun/verb pairs are described in Sections 3.4.1 to 3.4.2. Section 3.4.1 describes how a list of formally identical noun/verb pairs was compiled from the BNC frequency list, and how the data selected were screened for mistakes; Section 3.4.2 describes data sampling and justifies the decision to limit the sample to terms at or below frequency 1,000.
ii. The issues that arose during sense classification of the sample's concordances are listed in Section 3.4.3, specifically difficulties in the use of corpora (Section 3.4.3.1) and the use of dictionary information (Section 3.4.3.2).
iii. The semantic categories used for the classification of the senses identified in the sample in this thesis are presented in Section 3.4.4, both for derived senses (3.4.4.1) and base senses (3.4.4.2).
iv. The use of several of Marchand's (1964) criteria for directionality at the level of sense to a sample of noun/verb English conversion is described with examples in Section 3.4.5, specifically the criteria of SD (Section 3.4.5.1), RU (Section 3.4.5.2), SR (Section 3.4.5.3), SP (Section 3.4.5.4), FO (Section 3.4.5.5), and RR (Section 3.4.5.6), all at the level of sense. Even though the criteria were described in further detail in the previous chapter (cf. Section 2.5.6), a brief recapitulation of each, as described by Marchand, is given within each of these subsections for convenience.

3.4.1 A list of formally identical noun/verb pairs

The data corpus used in this thesis is based on the BNC (cf. 3.2 for a description of the corpus features and a justification of this selection). At the outset, a corpus query processor (*CQPWeb*),[32] was used for retrieval of the entire lemmatized frequency list of the BNC (XML edition), i.e. a list of all lemmas in the corpus together with their part-of-speech tag (POS)[33] and frequency of occurrence. The list consists of 659,465 lemmas.

The aim was to select a sample of formally identical lexemes, tagged both as verbs and nouns in the BNC frequency list. The compilation of this list's formally identical items relied on a tool using simple matching search syntax/query, with two main functions:

i. *Divide Data* for identification of the data in the frequency list csv file, and efficient data collection by category (for the list used, e.g. ART, VERB, INTERJ, etc., found under *Found categories*, see Figure 3.4.1.1).

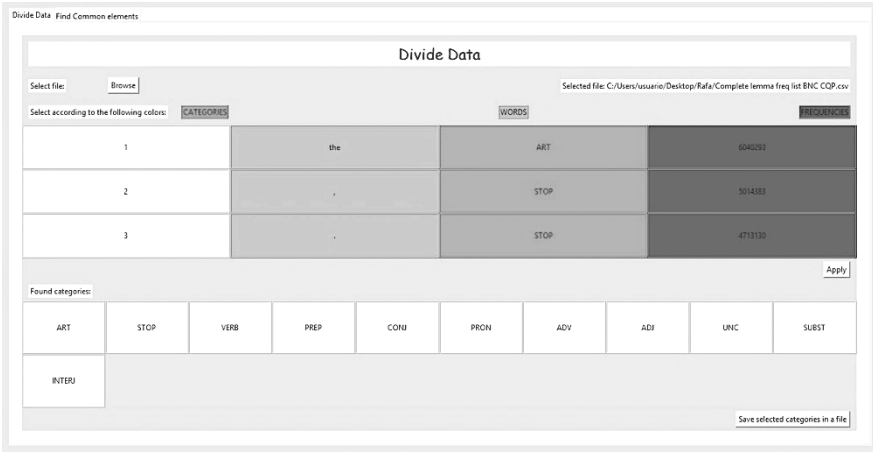

Figure 3.4.1.1. Tag identification in the BNC frequency list with the function *Divide Data*

ii. *Find Common Elements* for the identification and collection of the formally identical or common elements in two (or more than two) categories selected by running a simple matching test or list crossing. As this thesis focuses on noun/verb pairs, the categories VERB and SUBST

[32] Available at https://cqpweb.lancs.ac.uk.
[33] This thesis refers to POS as *word-class categories* or simply *categories*. Note also that the categories SUBST and VERB are referred to as noun and verb.

were selected (as in Figure 3.4.1.2), and a list of all lemmas tagged as both was generated, along with their frequency of occurrence as each category.

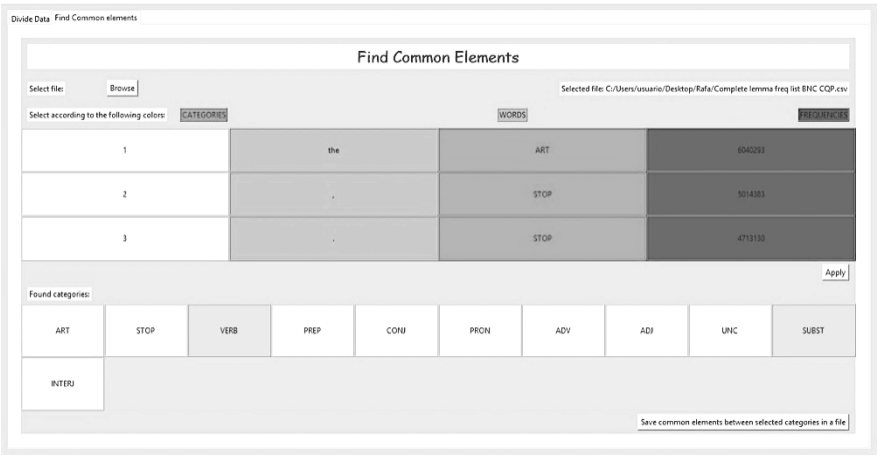

Figure 3.4.1.2. Selection of the categories VERB and SUBST in the function *Find common elements*

The BNC lemmatized frequency list obtained contained mistakes, even if the annotation accuracy is high. Hence, the list extracted was found to include mistakes too, even if the tool used for data collection (Section 3.4.1) was set up to generate the lists after removing terms which contained either numbers or symbols at their beginning or end and which are, thus, not actual words (e.g. *p4/t3* (1/2),[34] *camp-crp/cytr* (1/1), *5-* (1/7)). Entries containing spaces, symbols or numbers within (e.g. *check module* (2/1), *x'pert* (1/3), *d'ye* (40/10), *drtf1/e2f* (7/40)) were discarded using *Excel* searches and conditional formatting rules. The list thus obtained consisted of 35,984 lemmas, grouped as 17,992 noun/verb pairs.

This list was then used to obtain a stratified sample of 60 noun/verb pairs. It was found that nearly half of the pairs selected were not actual cases of noun/verb conversion, most mistakes being found for lexemes with low frequency of occurrence as one word-class category or the other, so manual screening became necessary at a later stage. Examples are provided below to illustrate some of the most common mistake cases cleared out from the list:

[34] The frequency of a term as noun/verb is given between brackets and in this order, following the information in the BNC lemmatized list extracted from *CQPWeb*.

i. Terms not attested as verb in the BNC: *slogan* (801/1), *batt* (92/1)
ii. Terms not attested as noun in the BNC: *dron* (18/38), *shear* (120/140), *rouse* (49/407), *sede* (6/7)
iii. Terms wrongly tagged as verb in the BNC: *beem* (1/1), *cloy* (4/3)
iv. Terms wrongly tagged as noun in the BNC: *narrate* (1/1), *brisk* (1/1)
v. Cases of inflection and/or affixation, when the affix is analysable in English (indicated as affixation in the OED): *unwrap* (1/49), *philosophise* (2/3), *rediscount* (10/11), *undersold* (5/6), *classified* (6/1)
vi. Compounds and neoclassical compounds, for the entirely different directionality patterns they may use: *housebreak* (1/9), *giftwrap* (4/7), *mindblast* (1/1), *handbag* (665/1, used metaphorically), *electrocoat* (1/1), *biotype* (7/2)
vii. Foreign and OE words (when used in a foreign/OE language context): *comunicación* (1/1, Spa), *sonare* (1/1, Ita), *tombe* (1/1, Fr), *Baumgarten* (7/1, Gr), *drinke* (1/1, OE), *lufe* (9/1, OE)
viii. Words used metalinguistically: *coerce* (2/187), *drat* (2/23)
ix. Misspellings: *wex* (1/1, for *wax*), *skool* (8/2), *controll* (6/1), *suprise* (8/21), also expressions: *godammit* (1/4), *sonuvanitch* (1/1)
x. Acronyms: *YSD* (1/1), *WIIW* (1/1), *SAD* (1/1)
xi. Brand names: *demacort* (1/1), *alkylate* (1/9), *logitek* (8/2)

The resulting list included 6,952 lexemes, grouped as 3,476 noun/verb pairs. Table 3.4.1 shows the raw frequency distribution as both noun and verb before and after screening.

The table shows that frequency distribution varied after screening. Most word-pairs occurred in low frequency ranges before screening, not after screening, because many mistakes occurred in the low frequencies, e.g. tagging errors.

Table 3.4.1. Raw frequency distribution of the unfiltered and screened lists of terms attested both as noun (N) and verb (V) in the BNC

Frequency distribution (raw)	**Unfiltered list**				**Screened list**			
	N	**%**	**V**	**%**	**N**	**%**	**V**	**%**
1	2,316	13%	7,083	39%	29	1%	150	4%
2–5	3,905	22%	5,268	29%	133	4%	316	9%
6–10	2,220	12%	1,301	7%	118	3%	231	7%
11–50	4,405	24%	1,574	9%	408	12%	661	19%
51–100	1,326	7%	559	3%	300	9%	319	9%
101–250	1,200	7%	717	4%	529	15%	510	15%
251–500	641	4%	484	3%	388	11%	379	11%
501–750	317	2%	182	1%	220	6%	154	4%
751–1,000	201	1%	136	1%	150	4%	121	3%
1001–5,000	894	5%	437	2%	727	21%	407	12%
5001–10,000	276	2%	106	1%	236	7%	99	3%
>10,000	291	2%	145	1%	238	7%	129	4%
Total	17,992	100%	17,992	100%	3,476	100%	3,476	100%

The screened list includes formally identical pairs attested both as noun and verb in the BNC, but this does not mean that every word-pair in the list is of interest here, and pairs which are actually not formed by conversion or mistakes remain here, because:

i. Even after revision, higher frequencies were not as exhaustively checked partly because, the higher the number of occurrences, the fewer tagging errors are expected.
ii. Cases open to discussion or with a doubtful analysis as one of the categories were included too to avoid bias, e.g. *whinney* (38/1), *schuss* (1/1), *rebel* (2,017/390), *hostel* (859/9).
iii. Instances of homonymy may be found; when conversion was not present, homonyms were replaced with another pair of similar frequencies to keep the sample as uniform as possible.

3.4.2 Data sample collection and expansion

The data sample collected was restricted to frequency 1,000 in the BNC, as one word class or as the other. The alternative to this restriction would have been to extract a stratified sample of the complete list so terms of all frequencies were included. This option was discarded for higher manageability, i.e. terms with a higher frequency of occurrence would result either in a less detailed semantic study, or in a study of fewer terms.

To which extent the decision to exclude terms with frequencies higher than 1,000 may have an impact on the analysis of directionality remains unclear. The assumption is that no substantial differences would be found as regards, e.g. the directionality patterns found. A sample including terms with frequencies up to 1,000 is here considered adequate for the study of directionality in present-day English, and for testing the applicability of the criteria. Table 3.4.2.1 presents the distribution of nouns and verbs after the frequency of occurrence was restricted to include the range 1–1,000.[35]

Table 3.4.2.1. Raw frequency distribution of the screened list of terms attested both as noun and verb in the BNC up to frequency 1,000

Frequency distribution (raw)	**Noun**	**%**	**Verb**	**%**
Freq. 1	26	1.3%	104	5.1%
Freq. 2–5	127	6.2%	245	12.0%
Freq. 6–10	109	5.3%	196	9.6%
Freq. 11–50	375	18.4%	502	24.6%
Freq. 51–100	285	14.0%	244	11.9%
Freq. 101–250	484	23.7%	366	17.9%
Freq. 251–500	330	16.2%	238	11.7%
Freq. 501–750	243	11.9%	120	5.9%
Freq. 751–1,000	63	3.1%	27	1.3%
Total	2,042	100%	2,042	100%

[35] Note that, in Table 3.4.2, the number of lexemes included within each frequency range may vary compared with Table 3.4.1, because lexemes are excluded as a pair if the frequency of one of the terms is higher than 1,000.

The screened list (i.e. containing pairs of lexemes in which both lexemes involved had a frequency of use of up to 1,000 occurrences) consists of 4,084 lexemes grouped as 2,042 pairs.

A first stratified sample of the list was obtained with 52 lexemes grouped as 26 pairs, i.e. one lexeme every 160 was selected from the list of terms ordered by the frequency of the noun, and another lexeme every 160 was selected from the list ordered by the frequency of the verb. For higher objectivity, the sampling interval started at 5, an aleatory number obtained from Excel's random function. The sample selected in this first stage made ca. 1.3% the screened list. The sample was enlarged by systematic doubling to keep the frequency ranges, so the sample remained representative of the frequencies included. Around 2.5% was analysed after the first sample doubling, ca. 5% after the second, and ca. 10% of the screened list after the third (one lexeme every 20 in each of the lists). The sample stages and the number of terms included per sample are represented in Table 3.4.2.2.

Table 3.4.2.2. Number of pairs/terms sampled from the BNC screened frequency list per sample extraction stage. Homonymy is not represented, i.e. numbers refer to pairs/terms, regardless of whether various homonyms may be available and/or in use for some of the terms

Sample	**Number of pairs/terms sampled from the BNC screened list**
1st sample	26/52
1st doubling	26/52
2nd doubling	50/100
3rd doubling	102/204
Total sample	204/408

An example of the terms included in the first sample and those included in the first expansion is provided in Table 3.4.2.3. The first column provides the number of the terms in the screened list from which the data were sampled, both when ordered by the frequency of the noun, and ordered by the frequency of the verb, to show how the list was still range-representative after each doubling.

Table 3.4.2.3. Pairs included in the first sample extraction and the first sample doubling from the BNC screened frequency list. Terms included in the first sample are in white background cell colour, terms included in the first expansion are shaded

List No.	BNC screened frequency list (Frequency range 1–1,000)					
	Ordered by the noun freq.			Ordered by the verb freq.		
	Pair	N_FREQ	V_FREQ	Pair	N_FREQ	V_FREQ
5	*whap*N/V	1	1	*whomp*N/V	1	1
165	*blather*N/V	6	10	*hank*N/V	368	2
325	*holler*N/V	15	54	*jaunt*N/V	92	5
485	*swoon*N/V	28	58	*dybbuk*N/V	40	9
645	*lisp*N/V	52	24	*spasm*N/V	282	15
805	*whimper*N/V	74	174	*curtsy*N/V	41	26
965	*skid*N/V	110	213	*scythe*N/V	97	55
1125	*bayonet*N/V	149	10	*bluster*N/V	32	65
1285	*sludge*N/V	201	21	*clot*N/V	109	99
1445	*hoover*N/V	272	101	*jot*N/V	71	150
1605	*paw*N/V*	351	91	*swerve*N/V	27	219
1765	*fatigue*N/V	532	38	*retail*N/V	21	335
1925	*saddle*N/V	748	256	*piss*N/V	251	572
85	*skulk*N/V	3	69	*flea*N/V	317	2
245	*tup*N/V	10	4	*burlesque*N/V	28	4
405	*nosh*N/V	22	6	*thwack*N/V	10	7
565	*doze*N/V	39	259	*helm*N/V*	279	11
725	*slob*N/V*	65	4	*dragoon*N/V	186	21
885	*fission*N/V	91	1	*slaver*N/V*	19	34
1045	*beep*N/V	125	37	*gorge*N/V*	432	50
1205	*punt*N/V*	173	35	*crank*N/V*	140	79
1365	*brood*N/V	234	206	*leer*N/V*	72	122
1525	*vow*N/V*	322	636	*latch*N/V*	197	183
1685	*paste*N/V	447	173	*scar*N/V*	718	266
1845	*wax*N/V*	623	209	*rot*N/V*	309	433
2005	*levy*N/V*	913	603	*tumble*N/V	186	838

A complete list of the data analysed in this thesis in alphabetical order is provided in Appendix B.3.4.1.

3.4.3 Sense classification of the concordances

The first stage of data analysis was a manual classification of the concordances for each term according to the semantic information in the OED. For this purpose, all concordances for each sampled term were extracted, as mentioned in Section 3.2, from the BNC version tagged by CLAWS available in *Sketchengine*. This tool allows intuitive, simple searches and, thus, quick concordance extraction via an advanced query by 'lemma' and by 'part of speech' covering all word forms of a lemma as a specific POS. The concordances obtained were classified manually according to the senses available in the OED. Concordance sense classification was intended for a clearer picture of current usage, in terms of frequency and register. Sense classification is described in further detail in Sections 3.4.3.1 and 3.4.3.2, covering corpus- and dictionary-derived issues, respectively.

3.4.3.1 Corpus-derived issues

This section lists a series of issues arising during semantic classification of concordances. The cases listed, if disregarded, may have an impact on the results. They should be considered carefully, especially if the goal is the analysis of frequencies and usage of lexemes, especially if the analysis is at the level of sense.

3.4.3.1.1 Discards: Wrongly tagged concordances

Wrong annotation is initially not expected to influence, e.g. overall frequency or register distribution for most of the terms included in the sample, but these variables may influence the results as relevant differences for some of the pairs, terms, or their senses, e.g. if numerous wrong tags are found, especially if the frequency of the lexemes is low. The following lists some of the issues that arose during sample processing:

i. Wrongly tagged instances of nouns and verbs. The cases wrongly tagged as verbs or nouns were recategorized and included in our analysis under their correct word class, e.g. example (12) tagged in the BNC as a noun was relisted in the sample as a verb, and example (13) tagged in the BNC as a verb instance was relisted as a noun, e.g.:

(12) *He **bombards/n** the brandy with a violent infusion of soda from the large siphon.*

(13) *Soon he was hammering on the door, **thud/v** after thud, a noise fit to wake the dead.*

ii. Wrongly tagged instances of adjectives. Noun-premodifying adjectives wrongly tagged as nouns (14) or verbs (15) were recategorized and discarded, e.g.:

(14) *The tiny eel was almost transparent, except for the jet black, pin **prick/n** eyes.*

(15) *It's possibly the most outrageous place anywhere in the Mediterranean, full of weird and wonderful people, **stilt/v** walkers, street markets, pavement cafés, and bars in which you just sit and watch a world you have never seen before walk […]*

iii. Intensifiers. Premodifying -*ing* forms were discarded, e.g.:

(16) *More than once they saw a passer-by, **soaking/v** wet, shout threats and curses at an open window.*

iv. Proper nouns. Proper nouns in the sample wrongly tagged as verbs (17) were recategorized and discarded, e.g.:

(17) ***Bray/v** cleverly lobbed the third from a penalty corner, before Lister scored the goal of the day.*

v. Metalinguistic uses: Metalinguistic occurrences tagged both as nouns (18) or verbs (19) for which no sense of word-class category can be ascribed and which were marked as *metalinguistic* and discarded, e.g.:

(18) *You will not find words like **skive/n** and naff in most dictionaries (or if you do they will be marked 'dialectal' or 'colloquial') […]*

(19) *OA as in old, goat, boat, **soak/v**, poke, Oates, voter.*

vi. Acronyms tagged as nouns (20) or wrongly tagged as verbs (21) were discarded, e.g.:

(20) *At the Hinkley C Inquiry this issue was pushed to the fore by the Severnside Campaign Against Radiation (**SCAR/n**).*

(21) *internal Strengths and Weaknesses of the organisation and the Opportunities and Threats to the organisation (hence **SWOT/v**).*

vii. Speaking mistakes, misspellings or unclear occurrences, (22), (23) and (24) respectively, were discarded, e.g.:

(22) *They know which one Richey actually is, since the above cutting (ha ha) suggests that The **Scar/n**, sorry, Star, are a tad confused.*

(23) *Full colour on every page! Dazzling, **hug/v**?*

(24) *[…] seek berries, shaste mooratoogs, **purl/v** i da paety loch an swittle taes.*

3.4.3.1.2 -ed*,* -ing *and other plurivalent units*

The sample includes cases that are complex to analyse consistently and/or ambiguous cases. Because they may have an impact on the results, especially regarding the frequency of occurrence for the lexeme's senses in use, these cases are described in this section. Note that all examples provided are from the BNC even if their corresponding sense in the OED is indicated after the examples when relevant.

Among the complex or ambiguous cases, terms in *-ed* or *-ing* are most frequently found, for their difficult word-class categorization. This is because the corpus includes numerous *-ed* and *-ing* occurrences as verb realizations in the participle forms. However, some of these are actually adjectivalizations or nominalizations. The challenging separation between adjectives, nouns and verbs used in the participle form relied on a series of tests.

Specifically, *-ed* and *-ing* forms were considered verbs when they express an ACTION or a PROCESS and:

a. appear embedded in a verbal construction, as part of the verb phrase, and taking auxiliary verbs, e.g.:
   (25) *The dense palm grove had been cleared and hundreds of casuarina trees chopped down and* ***grubbed/v*** *out.* (OED sense 3a)
   (26) *'What's* ***baffling/v*** *me,' said Amiss, 'is the notion of any one of those five having the physical capacity to do this.* (OED sense 6)
b. can take a direct object, e.g.:
   (27) *Fit-again Gascoigne was centre stage with a virtuoso display and two goals, and Taylor also* ***soaked/v*** *his other players in a sea of praise.* (OED sense 5b (fig))
   (28) *A danger lies in arriving home and* ***baffling/v*** *the local medical profession with an intractable high fever.* (OED sense 1a)
c. there is a *by*-agent that may be related to a process, e.g.:
   (29) *To be preferred is the Scottish king-list, which claims that he was captured and* ***blinded/v*** *by King Edgar […]* (OED sense 1a)

Forms in *-ed* or *-ing* were considered adjectival and discarded when they:

a. appear pre-modifying nouns, providing additional information about them, and as part of a noun phrase, e.g.:
   (30) *There were some bruised shins and* ***sprained/v*** *ankles, black eyes and a few cuts and grazes but nothing you wouldn't get on a rugby field […]*

(31) *Relief and anger swept through her as she looked up into the familiar dark,* ***scowling/v*** *face.*

b. are coordinated with other adjectives, e.g.:

(32) *Then he went out and came back with his eyes all black and* ***slitted/v****, his face streaked with soot, a blanket around him and he shouted, `I am Charlie Chan!' and pulled out the carving knife.*

(33) *The girl was making soft,* ***whimpering/v*** *sounds.*

c. can be modified by intensifying adverbs such as *very*, e.g.:

(34) *I was utterly* ***baffled/v****, but I gave you the benefit of every doubt, which by this time added up to a couple of thousand.*

(35) *It was clearly a case of arson, but the motive was* ***puzzling/v*** *at first.* (It can be modified by an intensifying adverb)

d. can be used as a subject complement, i.e. they appear with linking/sensory verbs, whether stative (e.g. *appear*, *be*, *look*, *seem*, etc.) or dynamic (e.g. *become*, *get*, *go*, etc.), e.g.:

(36) *Some parents go further. They become so* ***blinded/v*** *by adoration they manage to convince themselves their child has qualities of genius.*

(37) *Lin Foh seemed* ***incensed/v****, but kept his voice down as they reached the outside steps of the Coroner's Court.*

e. express STATE, e.g.:

(38) *I wake up in the morning* ***soaked/v****.* (STATE)

(39) *Everyone else was so quiet, so* ***scowling/v.*** *Gabriel looked from face to face in search of some explanation.* (STATE)

Forms in *-ing* were considered nouns and discarded when they express nominal semantic categories such as ACTION, EVENT, PROCESS, or RESULT, among others, or simply denote nominal concepts such as activities, techniques, or features, among others, e.g.:

(40) *[…] when infected by Giardia, experience an acute attack of watery diarrhoea, with bloating, abdominal pain,* ***belching/v*** *and fatigue.* (CONDITION)

(41) *A female soon flitted by. No orange tips, but the same green* ***dappling/v*** *on under wings.* (FEATURE/PROPERTY)

(42) *There was no* ***latching/v*** *up or Swiss darning here, it was very sheer work.* (PROCESS)

(43) *[…] athlete having recently returned from the Winter Paralympics in France where he took part in the cross country* ***sledging/v****. He won the 10,000m and 1500m gold medals […]* (EVENT: competition, activity)

(44) *Clearly irritated, Gorbachev and other senior officials watching the parade faced* ***barracking/v*** *by groups of protesters for more than 30 minutes before leaving the balcony of the Lenin Mausoleum.* (ACTION/EVENT)

(45) *Inside the house, the boy Master heard the happy quacking,* ***chirping/v****, croaking and squeaking, and went to the window.* (RESULT: sound)

The last two types, i.e. *-ed* adjectives and *-ing* nominalizations were recategorized as their corresponding word-class category and discarded.

Even after the application of these tests, some cases remained unclear, as both an adjectival/nominal and a verbal interpretation seemed possible. Ambiguous occurrences were included as verbs and marked with an asterisk (*) for concordances in which a verb periphrasis is recoverable, and for which both a verbal (e.g. PROCESS/ACTION) and an adjectival interpretation (e.g. STATE, as in (46)–(50)), or a verbal and a nominal interpretation (e.g. RESULT, as in (51)–(53)) are possible, e.g.:

(46) *[…] wrapper, which, by long practice is fitted instinctively without a wrinkle, then the sandpaper or phosphorous paper,* ***pasted/v*** *ready beforehand, is applied and pressed on so that it sticks fast.* (OED sense 2*)

(47) *The dust allergy means that Will has to be bedded on paper, and his hay always has to be* ***soaked/v****.* (OED sense 5*)

(48) *From hides we watched skimming house martins,* ***skulking/v*** *moor hens,* ***skidding/v*** *coots, a hovering kestrel, soaring skylarks, mud-probing greenshanks and fast-pecking black bellied dunlins.* (OED sense 5*)

(49) *These seats were the province of yelling, farting,* ***belching/v*** *gangs of adolescent males, the bane of the long-suffering manager, Len.* (OED sense 1*)

(50) *Many of these are small, one- or two-person outfits, snack kiosks and the like. But there are signs of* ***blossoming/v*** *entrepreneurial spirit.* (OED sense 2*)

(51) *At home, record sounds like a door shutting, car starting, plane going over, bird **chirping/v**, dog barking, baby crying, and so on.* (OED sense 1*)

(52) *[…] the table simultaneously for a brief period. Some designs leave gaps for two wheeled traffic, to avoid the danger of **skidding/v**, and for buses, to aid passenger comfort.* (OED sense 3b*)

(53) *However, it is best to avoid continuous harsh braking which may just result in locking the wheel and **skidding/v**.* (OED sense 3*)

A last case worth mentioning is that of nouns in attributive position. These were categorized as nouns and marked as *PREM*, as in (54). Only where the term as an adjective is commonly used and recognized in English (i.e. when the term appears as an adjective in dictionaries and conveys adjectival meaning different from the noun's senses recorded in the OED, as in (55)) were the concordances marked as adjectives and discarded:

(54) *Varnish stains: as well as using dyes, wood can also be coloured using **varnish/n** stains. These are clear varnishes to which either dyestuffs or transparent pigments, or both, have been added.* (OED sense 1c PREM)

(55) *He tossed a single **crimson/n** rose on to her oak coffin.* (PREM ADJ)

3.4.3.2 Dictionary-derived issues

Manual classification of the concordances of each term was not without problems. Some of the issues found derive from the use of dictionaries for sense analysis and are listed in this section.

3.4.3.2.1 Homonymy

Sense classification by concordance allowed analysis of homonymous lexemes for their inclusion or exclusion in the sample according to whether an available converted pair is also recorded in the BNC, or not. Homonyms were found for ca. 35% of the pairs in the sample (n=72 pairs), specifically, various homonymous entries were found for ca. 31% of nouns in our list (n=69) and for ca. 20% of verbs (n=45), but homonymous pairs were not always represented in both sources used in this thesis. After classification of the concordances, 30 homonymous converted pairs were found in both the

OED and the BNC and thus included in our study.[36] During the analysis of homonymy, the following cases were found:

i. Various entries are available in the OED for one of the terms in our list, either the verb or the noun, while only one entry is available for the counterpart. In this case, concordances were classified according to the senses in the various entries recorded in the OED, but only the entries with a related counterpart were retained for subsequent analysis of the directionality criteria, and the entries for which no related converted counterpart was found were discarded (see Section 3.4.3 for a description of the application of the criteria in this study), e.g.:

   (56) *Pinion*: for the term *pinion*, five separate nominal entries are listed in the OED (N1, N2, N3, N4, N5), three of which are recorded in the BNC. In contrast, there is only one verbal entry in the OED (V), and all the occurrences in the BNC refer to this. In this case, the occurrences that relate to terms for which no converted pair is found are discarded. This is important, as it may have an influence on register distribution and frequency (both overall and by sense).

   (57) *Bristle*: the entries N and V1, V2 are available in the OED, however, only senses of the related entries N and V1 are recorded in the BNC and, thus, one pair is included.

ii. Various entries are available in the OED for both terms in the sample list. In this case, the concordances were classified according to the senses in the various entries in the OED, and this resulted in the inclusion of various homonymous converted pairs when several related lexemes were recorded in the BNC concordances, as in (58)–(59), or in the inclusion of just one pair of lexemes, if no related counterparts are recorded in the BNC or just a pair was represented, as in (60)–(61), e.g.:

   (58) *Reel*: entries N1, N2, N3 and V1, V2, V3 are available in the OED, and the concordance classification shows senses relating to all the entries, so six lexemes are attested and three related pairs are therefore included: N1/V1, N2/V2, and N3/V3.

   (59) *Graf*: entries N1, N2, N3, N4, N5 and V1, V2, V3, V4 are available in the OED, and the concordance classification shows senses

[36] The list of pairs included in this thesis, with specification of homonymy and information on the actual noun/verb frequency data after exclusion of mistakes and unrelated concordances, and recategorization of the concordances as their correct word-class category is given in Appendix *B.3.4.2*.

relating to all the entries except for N2, so eight lexemes are attested and four related pairs are therefore included: N1/V1, N3/V2, N4/V3 and N5/V4. The entry discarded, N2, is marked as obsolete in the OED.

(60) *Spire*: various entries are available in the OED, N1, N2, N3, N4, N5, N6 and V1, V2, V3, but only senses of entries N1, N3 and V3 are attested in the concordances. In this case only one pair, N3/V3, is included as no related pair is found for entry N1.

(61) *Cork*: various entries are available in the OED, N1, N2, N3, N4, N5 and V1, V2, V3, V4 but only senses of entries N1 and V1 are attested in the concordances and, thus, only one pair is included.

Unrelated occurrences were discarded as described after sense classification. The classification of the concordances by sense proved relevant during data selection and may allow comparison of the meaning, frequency or register usage of each of the homonymous pairs.

3.4.3.2.2 Representation of the lexemes

Some of the issues encountered concerning the representation of the lexemes in the OED are discussed in this section. It must be noted first that many lexemes of the sample list show polysemous entries in the OED, with numerous senses and subsenses. Procedurally, Arabic-numbered senses (e.g. 1, 2, 3) were used for sense classification, and subsenses (e.g. 1a, 1b, 1c) were used when relevant too.

A difficulty that is to be expected from any large lexicographical source concerns sense representation. In this study, sense representation was found to be unequal in a few cases in the OED, as evidenced during the analysis of the SR (see Section 3.4.4.4). Just to provide an example, in the converted pair formed by the noun *slaver*^{N1} (senses in (62)) and the verb *slaver*^{V} (senses in (63)), the nominal subsense 1a seems to match the verbal sense 1, while the nominal subsense 1b matches the verbal sense 4 and its subsenses:

(62) *Slaver*^{N1}

1. a. Saliva or other fluid issuing from the mouth; drool. Also: †excessive appetite (obsolete). Cf. slobber n. 2a.

b. figurative. Insubstantial or worthless language; nonsense, flattery, impertinence. Now chiefly British regional.

(63) *Slaver*[V]

1. intransitive. Of a person or animal: to let saliva run from the mouth; to drool, slobber. Also with the mouth, etc. as subject. Also: †to crave food (obsolete).

4. figurative. a. intransitive. To utter meaningless, lustful, or sycophantic words; to show excessive admiration or desire; to fawn over; to lust after. […]

b. transitive. To utter (words) in a meaningless, lustful, or fawning manner. […]

c. transitive. To kiss, caress, or speak to (a person) in a lustful or fawning manner; to flatter.

In this case, if these senses are attested in the BNC, they are considered as two separate senses in both the noun and the verb (i.e. a literal sense and a figurative one).

Another difficulty was that some concordances did not fit any of the senses in the OED entries. This is because some typically very specific or slang senses, especially those that seem to have started to be in use recently may not have been recorded in the OED.[37] When the concordances did not match any of the senses listed in the OED for a specific lexeme, the procedure was as follows:

i. if a related sense was found in a conversion-related pair, then it was marked as such (as in (65) marked as "Sense added based on context. V, sense 10 (related to crank N1, sense 6" (see 64)) and a simple definition is given "to take/snort drugs", and
ii. in the rare case that no corresponding related sense is found in the pair senses and the concordance does not match any of the listed senses, external sources were consulted (as in (66) for which an extra sense (sense 3) was created based on various entries from *Urban Dictionary*,[38] a source which typically includes slang and specific senses, because the OED entries for the noun *swoon* did not include a CAUSER interpretation. For consistency, a new sense was created in both cases.

[37] The opposite can also be the case, i.e. newer senses recorded in the OED may not be attested in the BNC as it is a corpus from the late 20th century.
[38] https://www.urbandictionary.com/

(64) OED entry crank N1, sense 6[39]: "Draft additions March 2006. slang (originally U.S.). An amphetamine drug, esp. methamphetamine."

(65) Sense added based on context. V, sense 10 (related to crank N1, sense 6): "to take/snort drugs", e.g. "You get smack cut with all kinds of shit. A geezer down in Catford once mixed smack with flour. Imagine cranking/v up with that! Flour and water's an adhesive, innit? You don't want glue in your veins, do ya?" (BNC)

(66) *swoon*^{N}, sense 3 (added): "A person usually male who is very attractive." / "A word mainly used on the internet or chatrooms. This is usually addressing males but maybe for females too. It is used when there is a hot/sexy/cute boy that someone would "swoon" over. […]"
(https://www.urbandictionary.com/define.php?term=Swoon&page=3), e.g. "with Matey's assistance, 'I have heard of the ladies' sewing circle accused of many things, but never of bringing on a swoon/n. Resisting them, rather, is the usual belief.' He was being kind, she could tell, and not probing further, so she" (BNC).

Addition of these related senses occasionally led to the inclusion of a pair, e.g. the terms *kerf*, *brig* and *frisbee* were included in the sample even if no counterpart as one of the word classes was recorded in the OED. In the three cases, there was no verb, but these were included because an unambiguous verb use related to the noun senses is available in the BNC.

3.4.4 Semantic categorization of the senses

This thesis specifies the semantic categories expressed by the noun/verb pairs for the identification of directionality patterns between the lexemes, or whether there is a difference in the applicability of the criteria across categories. The senses identified for each lexeme in our sample were assigned a semantic category each. This categorization concerns both derivative (3.4.4.1) and base senses (3.4.4.2).

[39] Sense 6 is the Arabic-number given in this thesis for the specific sense cited, which appears as a draft addition to the entry in the OED. The decision to continue classifying the senses added as draft additions, or senses found in the BNC which are not recorded in the OED, like sense *10* in example (65) above, was taken for easier analysis of the criteria and classification of the concordances by sense.

3.4.4.1 Derivational semantics

Derivative senses were classified according to the categories listed in the literature for semantic analysis in conversion. Table 3.4.4.1.1 presents the semantic categories used for the semantic classification of denominal verbs in this thesis,[40] and Table 3.4.4.1.2 presents the semantic categories used for deverbal nouns.

Table 3.4.4.1.1. The semantic categories for Noun-to-Verb conversion (adapted from Plag 1999: 9; Bauer et al. 2013: 285, plus EFFECTIVE and DIRECTIONAL from Rainer 1993: 239, Valera 2023: 158–161, and DURATION from Clark & Clark 1979: 773)

Semantic category	**Paraphrase**	**Examples**
CAUSATIVE	'to make N, to cause to become N'	*orphan*
INCHOATIVE	'to become N'	*gel*
INSTRUMENTAL	'to use N, to perform an action with N'	*hammer*
LOCATIVE	'to make sthg to go to/in/on N'	*archive*
DURATION	'to carry an action during N'	*summer*
ORNATIVE	'to make N go to/in/on sthg, to provide with N'	*marmalade*
PERFORMATIVE	'to do N'	*tango*
PRIVATIVE	'to remove N'	*skin*
RESULTATIVE	'to make into N'	*package*
SIMILATIVE	'to do/act/make in the manner of or like N'	*chauffeur*
STATIVE	'to be, act as N'	*landmark*
EFFECTIVE	'to create, produce or bring about N'	*kitten*
DIRECTIONAL	'to go or move towards N'	*nightclub*

The categories MANNER OF MOTION and SOUND EMISSION listed in Bauer et al. (2013: 285) are not included in Table 3.4.4.1:

i. SOUND EMISSION, because verbs motivated onomatopoetically are not denominal, e.g. *wuff*, and
ii. MANNER OF MOTION, because it appears as a subtype of other categories.

[40] Cf. also Díaz-Negrillo & Fernández-Alcaina (2023).

In this line, Lieber's (2004: 91) "motional meaning[s]" for denominal verbs are viewed here as the result of the combination of various categories, and are classified in our sample as follows:

i. Senses expressing the motional meaning 'move in x manner' are classified as SIMILATIVE_MANNER OF MOTION, e.g. "Monster cars *sharked* past, the cluster of Wall Street skyscrapers loomed […]" (BNC),
ii. Senses expressing the motional meaning 'move using x' are classified as INSTRUMENTAL_MEANS OF MOTION, e.g. "We were told not to do this, told not to come here, told to *sledge* and throw snowballs and make snowmen all we wanted […]" (BNC), and
iii. Senses expressing the motional meaning 'move at x location', e.g. *quarterdeck* (Lieber 2004: 91, although not found in our sample, would be classified as LOCATIVE_MANNER OF MOTION.

Table 3.4.4.1.2 The semantic categories for Verb-to-Noun conversion (Plag 1999, Bauer et al. 2013: 286, plus PROCESS in Bauer 1983: 185, for nominalizations in *-ation*)

Semantic category	**Paraphrase**	**Examples**
EVENT	'the act/event of V-ing'	*surrender*, *catch*
ACTION	'the action of V-ing'	*fight*, *review*
INSTANCE	'an instance of V-ing'	*belch*, *frown*
PROCESS	'the process of V-ing or being V-ed'	*rot*
PRODUCT	'the thing that is created/comes into being by V-ing'	*tear*, as in '[…] making the *tear* worse'
RESULT	'the outcome of V-ing'	*divorce*
STATE	'the state of V-ing or being V-ed'	*regret*, *hope*
INSTRUMENT/MEANS	'the thing used for V-ing'	*cure*, *clog*
LOCATION	'the place where one/sthg V-s or is V-ed'	*dump*, *seat*
DIRECTION	'the direction or path of V-ing'	*decline*, *ascent*
AGENT	'one who V-s'	cook, flirt
PATIENT	'the thing V-ed, thing affected or moved by V-ing but not created'	*purchase*, *kill*
MEASURE	'how much is V-ed', 'measure of the degree to which sthg in V-ed'	*pinch*, *weight*

Derivative senses were sometimes classified as expressing more than one semantic category, or a combination of them, e.g. the verbal categories CAUSATIVE/RESULTATIVE often appear in combination, for the difficult separation between the two.[41] Nominal categories that have also been found difficult to dissociate are, e.g. ACTION/EVENT, ACTION/INSTANCE, and RESULT/STATE.

3.4.4.2 Base semantics

For the classification of base senses, ontological types or categories were used. Ontological categories are considered appropriate for the semantic classification of base senses in conversion because, as claimed in Schulte (2015: 4.1), ontological categories have been used in linguistic research from very different backgrounds and are candidates for universally accepted classifications. Specifically, the classifications by Dixon ([1991] 2005) and Levin (1993) were used to classify base verb senses. For nouns, the classifications by Szymanek (1988), Dixon ([1991] 2005), Lieber (2004); Murphy (2010), Haselow (2011), and Schulte (2015) were used.

3.4.5 Application of Marchand's (1964) criteria in conversion

This section describes and exemplifies the application of each criterion in the sample of noun/verb conversion-related terms. Based on the principle that word meaning must consider the role of senses, each criterion was applied at the level of sense. This entails sense classification of the BNC concordances for each lexeme, based on the sense information from the OED.[42] For convenience, a short description of the criteria by Marchand is provided within each subsection, as was also done in the description of the application of the criteria in affixation in Section 3.3.2. Note that the semantic criteria are presented following the order in Marchand (1964) and are followed by the related criteria of FO and RR.

[41] Note, however, that according to Rainer (1993, cited in Plag 1999: 125), CAUSATIVE verbs are deadjectival and RESULTATIVE verbs are denominal.
[42] The meaning of the lexemes was checked in the OED at different intervals of time during the period 2020–2023.

3.4.5.1 Semantic dependence (SD)

In the study on directionality in noun/verb converted pairs, Marchand's (1964) criterion of SD was dealt with according to the OED. Marchand (1964: 12) claimed that "[t]he word that for its analysis is dependent on the content of the other pair member is necessarily the derivative", e.g. *knife*^{N} > *knife*^{V} 'to V with a *knife*'.

After the manual classification of the BNC concordances of each lexeme into senses (following the sense information in the OED), the criterion of SD was measured. It may be worth recalling that, regarding the OED sense classification, Arabic-numbered senses (e.g. 1, 2, etc.) were considered, and subsenses (represented by alphabetical letters, e.g. 2a, 2b, etc.) were only considered when relevant. Also, the criterion was applied to the senses that appear in use in the BNC. In the application of SD, each sense was marked as follows:

i. Not showing SD (–) to the conversion-related senses, e.g. *anagram*^{N} "1. A transposition of the letters of a word, name, or phrase, whereby a new word or phrase is formed." does not show SD to its verbal counterpart.
ii. Showing SD (+) to the conversion-related pair's senses, e.g. *anagram*^{V} "2. intr. To make anagrams". Added senses, i.e. senses which do not appear represented in the OED, were also marked as showing SD based on definitions in other sources. For instance, sense 2 for *swoon*^{N} is not represented in the OED and was added after checking several entries in *urbandictionary*[43]: "A person usually male who is very attractive." or "A word mainly used on the internet or chatrooms. This is usually addressing males but may be for females too. It is used when the is a hot/sexy/cute boy that someone would "**swoon**" over. Or in other words drool fall in love with tap etc.". This sense was interpreted as showing SD (+).
iii. Additionally, the label (+*?*) is used for senses interpreted as showing SD towards the base but where this may be debatable. For instance, *tack*^{V5}, is defined in the OED as "transitive. = tackle v. 3. (to harness a horse) Usually with up. Also intransitive". Even though it does not directly refer to the related noun *tack*^{N7}, it is interpreted as "to put a tack^{N} to a horse". Also noted as showing SD but not as clearly (+?) is *swot*^{N}, for which an additional sense is identified in context:

[43] https://www.urbandictionary.com/define.php?term=Swoon

> "[…] Techniques" at the bell" are four (1) living with the headlines and main outlines of your subject by the use of **swot/n** cards; (2) rehearsing old papers (or papers concocted from textbook examples) under examination conditions, with […]" (BNC)

In this context, "swot cards" are understood as cards used to study, and thus the noun is interpreted as referring to the action of the verb "intransitive. To work hard at one's studies; to 'bone up'. Also transitive, to 'get up', 'mug up' (a subject); more rarely, without up." (OED). This sense was added, because the senses corresponding to the noun in the OED did not include it: "1. Work or study at school or college; in early use spec. mathematics. Hence gen. labour, toil." and "2. One who studies hard". Only sense 2 in the OED and the added sense are attested in the BNC.

iv. A question mark (?) is reserved to cases where definitions do not clearly show SD and deciding on an analysis of SD as (+) or (–) is questionable based on the OED definitions alone, e.g. *aggregate*^{V} "1. a. transitive. To gather into one whole or mass; to collect together, assemble; to mass." and the more directly related sense of *aggregate*^{N} "1. A complex whole, mass, or body formed by the union of numerous units or particles; an assemblage, a collection". In this case, both the nominal and verbal senses were marked as unclear because an interpretation of the verb as the base (V_GROUP EXISTENCE_HERD) and the noun as the RESULT of the action is most likely, and yet, based on the definition alone, the noun may be analysed as basic too (N_THING_MASS) and the verb as RESULTATIVE 'to gather into a N'.

The SD analysis for the senses was then contrasted between pairs, which also allowed for cases where various directions were involved (based on the SD criterion analysis) to be identified. Whether a sense is analysed as clearly showing SD (+) or interpreted as showing SD but with some doubt (+?) is not expected to be an issue. This is because the analysis of SD is later contrasted by related senses. If one of the members in a pair is marked as showing SD (+) or showing SD with some doubt (+?), this is interpreted as indicating a directionality if the related sense is marked as not showing SD (–), however, if the related sense is also marked as showing SD, the analysis of directionality is unclear between the senses.

Table 3.4.5.1 presents the pair *fuss*^{V}/*fuss*^{N} as illustration of the analysis of the criterion of SD in this thesis.

Table 3.4.5.1. Analysis of the criterion of SD at the level of sense for the conversion-related pair *fuss*$^{N/V}$

Lexeme	(OED) sense	Semantic Category	SD (+/–/?/+?)	Related Sen
fuss^{N2}	1. a. *A bustle or commotion out of proportion to the occasion; a needless or excessive display of concern about anything; ostentatious or officious activity.* […]	ABSTRACT CONCEPT	–	
fuss^{N2}	2. *A state of (more or less ludicrous) consternation or anxiety.*	STATE	–	
fuss^{N2}	3. [< ***fuss v***.] *One who* ***fusses****.*	**AGENT**	+	V, 1, 2
fuss^{V}	1. *intransitive. To make a* ***fuss****; to be in a bustle; to busy oneself restlessly about trifles; to move fussily (about, up and down, etc.).*	**EFFECTIVE**	+	N2, 1
fuss^{V}	Added sense: 1 ext. *Said of other things, not people.*	TRANSF. NATURE SIMILATIVE		
fuss^{V}	Added sense: 1b. '*To* ***fuss*** *over': to pay excessive attention to or concern for something.*	EXT_SIMILATIVE MANNER		
fuss^{V}	2. *transitive. To put into a* ***fuss****; to agitate, worry; to bother about trifles. Also to fuss up (? dialect): to flatter, treat with fussy politeness.*	**CAUSATIVE/ RESULTATIVE**	+	N2, 2

As can be seen in Table 3.4.5.1, three senses of the noun are attested in the BNC, of which two senses do not seem to show SD to the verb (marked with a minus sign (–)), while one of those senses (3) shows SD to the verb (+), as the counterpart verb is used in the definition of this sense (in bold) "*One who* ***fusses***.", and also, clear reference to the verb entry is made, a derivation direction even being indicated in this case "[< **fuss v**.]". On the other hand, two senses of the verb are attested (although sense 1 develops presents transferred or extended senses itself too, hence marked in grey, and for which

no SD is analysed as it is assumed that the SD analysis is the same as in the main sense). Of these two senses, both are analysed as showing SD to the N, because the counterpart noun is used in the definition of the senses (also in bold).

The criterion of SD in this pair is interpreted as indicating a bidirectional sequence of the type noun-to-verb-to-noun (N>V>N), where the noun senses 1 and 2 are bases, the verb creates two directly related senses to the nominal senses as shown in column *Related senses*, and then a new sense is created for the noun in relation to any of the senses of the V, as represented in Figure 3.4.5.1, with specification of the semantic category assigned to each sense in this thesis analysis:

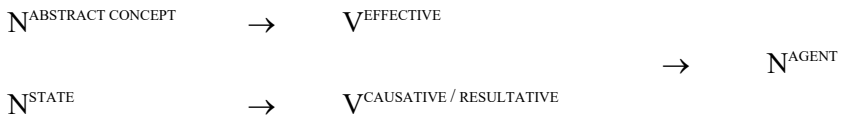

Figure 3.4.5.1. Exemplification of related categories for the pair *fuss*$^{N/V}$

3.4.5.2 Restrictions of usage (RU)

Regarding the criterion of RU, Marchand's standpoint is that "[i]f one word has a smaller range of usage than its pair member, it must be considered the derivative" (1964: 13). Marchand listed various possibilities for RU, repeated here for convenience, (1969: 13–14), specifically:

i. for one of the words not to be generally accepted while the other is commonly used (RU1),
ii. for a word to be restricted to certain forms as one of the word classes while it is not restricted as the other (RU2),
iii. for a word to be used as half serious or semifacetious (RU3), or
iv. to take a literary or poetic use (RU4).[44]

[44] As in the method followed for the pilot study, figurative and extended senses were quantified as restrictions in our analysis only in some cases, i.e. if a sense of a lexeme contrasts with that of the counterpart lexeme's related sense in that it can only be used figuratively, then the figurative sense would be analysed as restricted in use (+). If a specific sense covers the use of the related sense in the counterpart lexeme and additionally it is described as with the possibility to take a figurative interpretation, then this is not counted as restricted (–), because this specification would rather widen the SR of the sense in question (Ruz & Cetnarowska 2023: 14).

A more detailed description of each RU type is presented in Section 2.5.6. In the study of the applicability of the criteria for directionality in a sample of noun/verb conversion, the criterion of RU was measured at the level of sense, based on OED information. Independently of the type of RU identified, the senses in our sample were classified as:

i. Not showing RU (–), e.g. *soak*^{V} "a. To lie immersed in a liquid for a considerable time, so as to be saturated or permeated with it; to become thoroughly wet or soft in this manner."
ii. Showing RU (+), e.g. *soak*^{N} "1. c. dialect. A piece of marshy, swampy ground."

The criterion of RU was then analysed by comparing the related senses in the sample pairs, and by considering the total number of senses showing any restrictions for each pair according to the OED. Table 3.4.5.2 exemplifies the analysis of RU for the pair *skive*$^{N3/V3}$.

The table specifies the application of the criterion of RU in this thesis with the pair *skive*$^{N3/V3}$. Restrictions are marked in grey font in the second column, which provides the OED senses. The fourth column, *RU*, specifies whether a sense is restricted (+) or not (–). The restriction type according to the ones listed by Marchand (1964) is specified in the fifth column, *RU type*, and the number of restricted senses out of the total number of senses in use for each lexeme is specified in the last column *nSen +RU*. In the example pair *skive*$^{N3/V3}$, this criterion does not indicate a directionality, as all senses in use are marked as restricted.

A pilot study of RU on affixation (Ruz & Cetnarowska 2023: 27), showed that the criterion of RU proves useful for the identification of directionality only at the level of sense on a base-derivative comparison, and only for specific cases. A similar picture is expected to be found in the conversion sample.

Table 3.4.5.2 Restrictions of usage in the pair *skive*$^{N3/V3}$ (OED). Sense restrictions appear in grey font

Lexeme	OED sense no. and definition	Semantic category	RU (+/–)	RU type	nSen +RU
skive^{N3}	*2. colloquial (chiefly British). b. An instance of avoiding work or a duty by staying away or leaving early. Frequently in on the skive.*	INSTANCE	+	RU1	1/1
skive^{V3}	*2. transitive. Originally U.S. College slang. To avoid (work or a duty) by leaving or being absent; (now) esp. to play truant from (school). Now chiefly British colloquial.*	V_ACTION_AVOID	+	RU1	2/2
skive^{V3}	*3. colloquial (chiefly British). a. intransitive. Originally Military slang. To avoid work or a duty by staying away or leaving early; to shirk; (sometimes) spec. to play truant from school. Also with off (in prepositional phrase specifying the activity, duty, etc.).*	V_ACTION_AVOID	+	RU1	

3.4.5.3 Semantic range: Qualitative analysis (SR)

Regarding the criterion of SR, Marchand (1964: 14) argues that "[o]f two homophonous words exhibiting similar sets of semantic features the one with the smaller field of reference is the derivative", e.g. *convert*^{V} > *convert*^{N} 'one who has been converted to a religion/belief'. SR is measured in this thesis based on a qualitative analysis or comparison of the senses for the lexemes in the conversion sample.

The analysis of this criterion is exemplified for the pair *whimper*$^{N/V}$ in Table 3.4.5.3, for which the SR is interpreted as "≈", meaning that the SR covered by the lexemes senses is similar, with few differences.

Table 3.4.5.3. Semantic range (SR) for the pair *whimper*$^{N/V}$

Lexeme	OED senses	Sense	SR
whimper^{N}	1. a. A feeble, broken cry, as of a child about to burst into tears; a fretful cry expressive of complaint or grief.	1	≈
	b. A similar cry of dogs, etc.	2	
	c. transferred. Of inanimate things.	3	
	2. not with a bang but a whimper: see bang n.1 2b.	4	
whimper^{V}	1. a. intransitive. To utter a feeble, whining, broken cry, as a child about to burst into tears; to make a low complaining sound. / b. figurative. To complain pulingly; to 'whine': esp. for, after, †to something. / c. transitive. To utter or express in a whimper.	1	
	2. intransitive. Of an animal, esp. a dog: To utter a feeble querulous cry.	2	
	3. Of running water or the wind: To make a continuous plaintive murmur. Also transitive.	3	

The possible interpretations of the SR of a pair are as follows:

i. The pair has a similar SR (≈), as in *whimper*$^{N/V}$ above. Although the noun presents an extra phrasal use, it is unclear whether this sense is relevant for the directionality thus the lexemes were analysed as showing a similar SR. Or e.g. *hex*$^{N/V}$, the nominal use referring to "[a] magic spell or curse." and the verb with a PERFORMATIVE interpretation "intransitive. To practise witchcraft. Also transitive, to bewitch, to cast a spell on."

ii. One of the lexemes has a wider SR (>), e.g. *bayonet*^{N} > *bayonet*^{V}. In this case, the nominal senses refer principally to "a stabbing instrument" (INSTRUMENT) and are also metonymically extended to refer to "military force" and to "soldiers armed with the instrument", and (figuratively) extended to refer to people or other instruments with a similar function/motion. The verb only presents an INSTRUMENTAL sense "1. transitive. To stab or pierce with a bayonet."

iii. One of the lexemes has a slightly wider SR, or the lexemes' SR is closely similar (≳), e.g. *dwarf*^{N} ≳ *dwarf*^{V}. In this case, the noun shows more specific extended senses in use, while the verb senses are more general.

Because considering the number of senses as indicative of directionality did not prove a useful method in the pilot study (cf. 3.3.3.3), the criterion of nSen was not studied for the directionality sample. This is partly because:

i. The representation of senses in the OED is not consistent (cf. Section 3.4.3.2.2). This is also the case e.g. in *whimper*$^{N/V}$ (see Table 3.4.5.3 above), for which a comparison of the nSen of the lexemes based on the Arabic-numbered senses provided in the OED alone lists two senses for *whimper*^{N}, while *whimper*^{V} shows three senses. After sense re-numbering (under column *Sense* in the table), *whimper*^{N} could be interpreted as taking four senses, while *whimper*^{V} would take three senses.
ii. The extent to which a difference in the number of senses between a pair, be it wider or narrower, may serve to indicate a difference in the SR of the lexemes is unclear.

3.4.5.4 Semantic pattern (SP)

Regarding the criterion of SP, Marchand (1964: 15) stated that "[c]ertain words have characteristic meanings which mark them as derivatives", e.g. *father*^{V} 'to act as a father'. The criterion of SP was also measured at the level of sense based on OED information in the study of the applicability of the criteria for directionality in a sample of noun/verb conversion. Specifically, the BNC concordances are assigned a sense, and the senses in use are marked as follows:

i. Not showing a SP typical of a derivative (–), e.g. *beep*^{N} "The sound made by a horn on a motor car or other vehicle; a short high-pitched sound such as is emitted by an echo-sounder, a radar device, etc. Also attributive."
ii. Showing a SP typical of a derivative (+), e.g. *beep*^{V} in both of its senses "1. transitive. To sound (a horn); to make (something) emit a short high-pitched sound; to indicate by sounding beeps.; 2. intransitive. To emit beeps."
iii. Additionally, senses may be classified as showing SP but where this is debatable (+?). For instance, sense 3 for *chaperon(e)*^{N} "3. b. transferred. One who escorts; guide, conductor." is marked as showing SP to the verb sense "1. transitive. To act as chaperon to (a young lady); to escort." but with doubts (+?). This is because it is interpreted as showing a SP typical of a derivative "one who Vs" expressing the semantic category AGENT. However, it may be argued that, as the OED indicates, it is transferred from the main sense of the noun "3. a. figurative. A person, esp. a married or elderly woman, who, for the sake of propriety, accompanies

a young unmarried lady in public, as guide and protector.", and thus not related by conversion, but simply an extension within the same word-class category. The verb sense is marked as showing SP (+) to the noun sense 3a, marked as not showing SP.

iv. The label (*?*) is reserved for senses for which an analysis of SP is unclear e.g. *hoax*^{N} "1. b. concrete. One who is a deception, 'a fraud'." (AGENT), which may simply be an extended use from the nominal sense "1. a. An act of hoaxing; a humorous or mischievous deception, usually taking the form of a fabrication of something fictitious or erroneous, told in such a manner as to impose upon the credulity of the victim.", which however shows SP to the verb sense "transitive. To deceive or take in by inducing to believe an amusing or mischievous fabrication or fiction; to play upon the credulity of".

Like in the analysis of SD, whether a sense is analysed as clearly showing SP (+) or interpreted as showing SP but with some doubts (+?) is not expected to be an issue because the analysis is later contrasted by related senses, within the pairs of lexemes. Table 3.4.5.4 exemplifies the analysis of the criterion of SP for the pair *fuss*^{V}/*fuss*^{N}.

As can be seen in the table, three senses of the noun are attested in the BNC, two of which senses do not show a SP typical of a derivative (–), and only one of the senses (3) shows a SP typical of a derivative paraphrased as 'One who Vs'. On the other hand, two senses of the verb are attested in the BNC, both showing a SP typical of derivatives, the first sense paraphrased as 'To make a N', and sense 2 as 'To put into a N (STATE)'.

Table 3.4.5.4. Analysis of the criterion of SP at the level of sense for the conversion-related pair *fuss*$^{N/V}$

Lexeme	OED sense no. and definition	Semantic category	Paraphrase	SP (+/–/?/+?)
fuss^{N2}	1. a. *A bustle or commotion out of proportion to the occasion; a needless or excessive display of concern about anything; ostentatious or officious activity.* […]	ABSTRACT CONCEPT		–
fuss^{N2}	2. *A state of (more or less ludicrous) consternation or anxiety.*	STATE		–
fuss^{N2}	3. [< ***fuss v***.] *One who* ***fusses***.	**AGENT**	One who Vs	+
fuss^{V}	1. *intransitive. To make a* ***fuss****; to be in a bustle; to busy oneself restlessly about trifles; to move fussily (about, up and down, etc.).*	**EFFECTIVE**	To make a N	+
fuss^{V}	Added: 1 ext. *Said of other things, not people.*	TRANSF. NATURE SIMILATIVE		
fuss^{V}	Added: 1b. '*To* ***fuss*** *over': to pay excessive attention to or concern for something.*	EXT_SIMILATIVE MANNER		
fuss^{V}	2. *transitive. To put into a* ***fuss****; to agitate, worry; to bother about trifles. Also to fuss up (? dialect): to flatter, treat with fussy politeness.*	**CAUSATIVE/ RESULTATIVE**	To put into a N (STATE)	+

3.4.5.5 Frequency of occurrence (FO)

As previously noted, Marchand (1964) mentions frequency of occurrence (hereafter FO for the criterion) too in relation to RU, such that, if a word is less commonly used than its counterpart, then, this may be expressed in terms of frequency. In this thesis, FO is analysed as a separate, though clearly not unrelated criterion. Specifically, a comparison of the frequency of occurrence of the senses involved in each pair is carried out. Normalized frequencies (NF, here referring to the number of occurrences of a lexeme per million tokens) are used.

Regarding FO, it must be noted again that, if a reliable comparison of the frequency of the lexemes or of their senses in use is the goal, a revision

and classification of the concordances ought to be made first (as described in Section 3.4.3 with special consideration of the issues mentioned in Sections 3.4.3.1 and 3.4.3.2). In a comparison at the level of sense, the reason is clear, but even for a comparison of the frequency of occurrence by lexemes, a revision of the concordances is necessary. This need is clear in cases where various homonymous lexemes are available, but the overall frequency of lexemes may vary to a certain extent even regardless of homonymy. See for instance the examples of Tables 3.4.5.5.1 and 3.4.5.5.2.

Table 3.4.5.5.1. Exemplification of the variation of the raw frequency of some terms of the sample after concordance reclassification for the effect of homonymy

Term/Pair	Noun initial freq.	Verb initial freq.	Noun revised freq.	Verb revised freq.
graft	185	187	210	162
graft$^{N1/V1}$			122	147
graft$^{N3/V2}$			11	1
graft$^{N4/V3}$			52	9
graft$^{N5/V4}$			25	5
mace	77	12	87	2
mace$^{N5/V3}$			5	2
mace^{N1}			19	
mace^{N2}			62	
mace^{N4}			1	
mash	103	129	126	106
mash$^{N1/V1}$			122	95
mash^{N2}			1	
mash^{N}			3	
mash^{V2}				1
mash^{V3}				10

Table 3.4.5.5.1 shows three examples where the lexemes' frequency varies after concordance reclassification and identification of homonyms. For *mash*, for instance, corpus frequency data indicates that the verb (n=129) is more frequent than the noun (n=103). After revision and reclassification of the concordances, however, not only is the noun (n=126) more frequent than the verb (n=106), but some of the concordances are identified as examples of

unrelated homonymous lexemes and are thus discarded. Unrelated homonyms may have a more relevant effect on the included pair frequency in other cases, e.g. *mace*, the frequency of the pair being reduced to five nominal occurrences and two verbal occurrences after the exclusion of unrelated examples.

The picture changes also in the case of *graft*, both because some concordances wrongly tagged as noun or verb are reclassified, and because various related pairs are found and thus included separately in the analysis.

Table 3.4.5.5.2. Exemplification of the variation of the raw frequency of some terms of the sample after concordance reclassification

Term	Noun initial freq.	Verb initial freq.	Noun revised freq.	Verb revised freq.
barter	83	109	121	71
pinion	29	19	21	27
varnish	334	99	358	75
vow	320	630	327	623

Table 3.4.5.5.2 shows examples of the variation in the frequency of lexemes after reclassification of the concordances, for pairs for which homonymy does not play a role. It seems that the variation in lexeme frequency after a reclassification and revision of the concordances does not change the overall picture for most cases in the sample, e.g. *varnish*$^{N/V}$ or *vow* $^{N/V}$, where the interpretation is that the noun is still more frequent than the verb in the case of *varnish*$^{N/V}$, and the verb remains more frequent than the noun for the pair *vow* $^{N/V}$. However, instances can be found in which the picture does change, e.g. in the analysis of FO at the level of lexeme, *barter*^{V} is more frequently used than *barter*^{N} according to the frequencies given by the corpus, or *pinion*^{N} is more frequently used than its counterpart *pinion*^{V}. Revision and reclassification of the BNC concordances for each lexeme shows that the case is otherwise. Note that raw frequencies are provided as this is just an example, and that more specific results concerning the criterion of FO and its application are provided in Section 4.2.6.

The application of the criterion at the level of sense was then carried out by comparing the frequency of each of the senses for each lexeme and their relation(s). This was possible, as each BNC concordance was classified according to the OED senses. Table 3.4.5.5.3 exemplifies the analysis of FO

in one of the pairs of the sample. Table 3.4.5.5.3 shows that the senses for *whimper*^{V} (1, 2, 3) are more frequent than their related senses in *whimper*^{N} (1a, 1b, 1c), be this difference in frequency relevant or not. The frequency of the verb is also higher than that of the noun in a lexeme-level comparison. It remains unclear too from which point a difference in the frequency of occurrence between senses may be relevant for an analysis of directionality.

Table 3.4.5.5.3. Raw frequency of occurrence (RF) for *whimper*$^{N/V}$ at the level of sense (BNC)

Lexeme	OED senses	Sense	RF
whimper^{N}	1. a. A feeble, broken cry, as of a child about to burst into tears; a fretful cry expressive of complaint or grief.	1	57
	b. A similar cry of dogs, etc.	2	3
	c. transferred. Of inanimate things.	3	1
	2. not with a bang but a whimper: see bang n.1 2b.	4	11
whimper^{V}	1. a. intransitive. To utter a feeble, whining, broken cry, as a child about to burst into tears; to make a low complaining sound. / b. figurative. To complain pulingly; to 'whine': esp. for, after, †to something. / c. transitive. To utter or express in a whimper.	1	155
	2. intransitive. Of an animal, esp. a dog: To utter a feeble querulous cry.	2	8
	3. Of running water or the wind: To make a continuous plaintive murmur. Also transitive.	3	2

In a test comparison carried out between lexemes, seven pairs were easily identified where the direction indicated by FO is inconclusive:

i. In two pairs, because the noun and verb show the same frequency of occurrence, e.g. *whomp*$^{N/V}$ (1/1) and *whap*$^{N/V}$ (1/1) in Table 3.4.5.5.4.
ii. In two pairs, because the difference between the pair of lexemes was not considered large enough to indicate a directionality, e.g. *jolt*$^{N/V}$ (163, 162) or *quack*$^{N3/V1}$ (35/33).
iii. In two pairs, the difference between the pairs was neither considered large enough because the frequency of occurrence that both lexemes show is very low, e.g. *sloosh*$^{N/V}$ (1/2), *kerf*$^{N/V}$ (3/2).
iv. In one pair, *transect*$^{N/V}$ (7/5), because the total frequency of the pair is below 15, and a relative percentage difference between the frequency of occurrence of the two lexemes is lower than 40%.

Table 3.4.5.5.4. Examples of the applicability of FO. NF stands for the number of occurrences of a lexeme per million tokens in the BNC

Pair	Number of occurrences		NF (BNC)		N/V Relative percentage difference	Direction
	Noun	Verb	Noun	Verb		
piston$^{N/V}$	236	6	2.10	0.05	190.08	N>V
belch$^{N/V}$	27	142	0.24	1.27	136.09	V>N
whomp$^{N/V}$	1	1	0.01	0.01	0	?
whap$^{N/V}$	1	1	0.01	0.01	0	?
jolt$^{N/V}$	163	162	1.45	1.44	0.62	?
quack$^{N3/V1}$	35	33	0.31	0.29	5.88	?
sloosh$^{N/V}$	1	2	0.01	0.02	66.67	?
kerf$^{N/V}$	3	2	0.03	0.02	40	?
transect$^{N/V}$	7	5	0.06	0.04	33.33	?

However, establishing relative percentage differences to decide from which point a difference between a pair is relevant is not a statistical measure. Also, several pairs, including those with a frequency of occurrence below 15 in the BNC, exhibit a relative percentage difference exceeding 40%. Due to their low frequency, it remains unclear whether this difference is significant or not, despite the high relative difference between the lexemes (cf. the examples in Table 3.4.5.5.5).

Pairs with higher frequencies of occurrence posed fewer difficulties. Relative percentage differences between pairs above 10% were initially considered significant, whereas differences below 10% were not. However, the decision to consider a relative difference of 40% (for frequencies below 15) or 10% (15 or higher) as relevant is arbitrary, i.e. they are thresholds chosen as a practical guideline rather than supported by formal analysis.

Thus, for a more reliable interpretation of the data, a Chi-squared test (χ^2) was performed using the Excel function *CHISQ.TEST*. This test fits here as it allows to statistically assess whether the observed differences between pairs are significant ($P < 0.05$) or are due to random variation ($P > 0.05$), providing a more robust data-driven approach to evaluating frequency differences. The Chi-squared test identified the observed differences between a larger number of pairs in the sample as not significant (n=29 pairs, 12.83%).

Table 3.4.5.5.5. Examples of unclear cases following a relative difference analysis. NF stands for the number of occurrences of a lexeme per million tokens in the BNC

Pair	Number of occurrences		NF (BNC)		N/V Relative percentage difference	Direction
	Noun	Verb	Noun	Verb		
glissade$^{N/V}$	7	3	0.06	0.03	80	N>V
blather$^{N/V}$	6	9	0.05	0.08	40	V>N
keek$^{N/V}$	1	4	0.01	0.04	0	V>N
tattle$^{N/V}$	9	3	0.08	0.03	100	N>V
thwack$^{N/V}$	10	6	0.09	0.05	50	N>V
wuff$^{N/V}$	4	2	0.04	0.02	66.67	N>V

3.4.5.6 Range of registers (RR)

For the criterion of RR, this thesis uses the BNC register distribution data to study the range of registers covered by the senses of each lexeme. The base hypothesis is that the derived lexeme and their senses would cover a smaller range of registers than the base (cf. Marchand 1964: 14).

RR was measured as a quantitative criterion at the level of sense. For this purpose, all concordances for each lexeme were extracted from the BNC alongside the metadata of their register usage. Specifically, RR was compared between lexemes/senses following:

i. Lee's (2001) proposed classificatory scheme, which groups the BNC registers or genres into twelve main groups or "super genres" (2021: 57–58).
ii. "David Lee's classification" information extracted from the BNC, which classifies BNC concordances into 71 registers or genres, e.g. *W_fict_prose*, *W_non_ac_soc_science*, *S_interview_oral_history*, *S_brdcast_news*, etc. This information allows the classification of the concordances into written vs spoken modes, and into specific registers, (e.g. fiction) or subregisters (e.g. prose), when relevant.

Once the concordances were extracted and classified semantically by senses, the range of registers covered by each sense/lexeme was calculated, together with the frequency for each of the registers in use for each sense/lexeme.

Calculations were carried out with Excel and Python, in *Goggle Colaboratory*,[45] for easier extraction of the registers in use for each of the senses and their frequency. An example of the organization of the data by sense and register is provided in Table 3.4.5.6 for the three various lexemes in use for the term *sledge*.

Table 3.4.5.6. Register classification of *sledge* by senses. The absolute frequency of each register is under column number four *Freq*.

W-class	Mode	David Lee's classification	Freq.	Lee's (2001) classification	Sense	OED entry, sense
V	Written	W_fict_prose	1	W_fict	2	V1, 2
V	Written	W_fict_prose	5	W_fict	4	V2, 2
V	Written	W_misc	3	W_other	4	V2, 2
V	Spoken	S_conv	1	S_other	4	V2, 2
V	Written	W_ac_nat_science	1	W_ac	4	V2, 2
V	Spoken	S_brdcast_discussn	1	S_brdcast	4	V2, 2
V	Written	W_misc	1	W_other	6	V3, 1
V	Written	W_newsp_other_report	2	W_newsp	6	V3, 1
V	Written	W_pop_lore	2	W_other	6	V3, 1
N	Written	W_ac_humanities_arts	1	W_ac	1a	N1, 1a
N	Written	W_biography	1	W_other	1a	N1, 1a
N	Written	W_fict_prose	1	W_fict	1a	N1, 1a
N	Written	W_non_ac_humanities_arts	1	W_non_ac	1a	N1, 1a
N	Written	W_pop_lore	1	W_other	1a	N1, 1a
N	Spoken	S_conv	1	S_other	1a	N1, 1a
N	Spoken	S_interview_oral_history	1	S_interv	1a	N1, 1a
N	Written	W_instructional	2	W_other	1a	N1, 1a
N	Written	W_misc	2	W_other	1a	N1, 1a
N	Written	W_news_script	2	W_other	1a	N1, 1a
N	Written	W_newsp_other_reportage	3	W_newsp	1a	N1, 1a
N	Written	W_ac_humanities_arts	2	W_ac	1c	N1, new
N	Spoken	S_conv	1	S_other	2a	N2, 1a
N	Written	W_ac_humanities_arts	6	W_ac	2a	N2, 1a

[45] Also known as *Google Colab*, or simply *Colab* is introduced by Bisong "as an alternative platform to quickly spin up a high-performance computing infrastructure running Jupyter notebooks for rapid data science and data modeling tasks" (2019: 64). This platform can be accessed for free at https://colab.research.google.com/

N	Written	W_ac_nat_science	2	W_ac	2a	N2, 1a
N	Written	W_ac_polit_law_edu	1	W_ac	2a	N2, 1a
N	Written	W_ac_medicine	1	W_ac	2a	N2, 1a
N	Written	W_biography	2	W_other	2a	N2, 1a
N	Written	W_fict_poetry	1	W_fict	2a	N2, 1a
N	Written	W_fict_prose	66	W_fict	2a	N2, 1a
N	Written	W_misc	71	W_other	2a	N2, 1a
N	Written	W_newsp_brdsht_nat_misc	1	W_newsp	2a	N2, 1a
N	Written	W_newsp_other_social	1	W_newsp	2a	N2, 1a
N	Written	W_non_ac_humanities_arts	2	W_non_ac	2a	N2, 1a
N	Written	W_pop_lore	10	W_other	2a	N2, 1a
N	Written	W_biography	2	W_other	2a	N2, 1a
N	Written	W_biography	5	W_other	3a	N2, 2a
N	Written	W_fict_prose	2	W_fict	3a	N2, 2a
N	Written	W_misc	2	W_other	3a	N2, 2a
N	Written	W_non_ac_humanities_arts	2	W_non_ac	3a	N2, 2a
N	Written	W_non_ac_nat_science	1	W_non_ac	4	N2, 3
N	Written	W_biography	5	W_other	3a	N2, 2a

Following the information in Table 3.4.5.6, the conclusion would e.g. be that the lexeme *sledge*^{N1} has a wider register use compared to its counterpart *sledge*^{V1}, because the noun appears in various written and spoken texts in the BNC, while for the verb a single register is found. This may be as a result of the difference in the frequency of occurrence of the lexemes in the pair, or the other way around.

Regarding RR, it remains unclear from which point a difference in the range of registers covered by pairs is significant or not, and, thus, to which extent the results of RR can be considered reliable for directionality.

Fisher's Exact Test was selected to test whether the difference in RR between the pairs is significant. This is because Fisher's Exact Test is claimed to be more reliable for the estimation of statistical significance (p-values) for small-size categorical data, where a Chi-squared test (as applied for FO, cf. Section 3.4.5.5) could be inaccurate (Brezina 2018: 113). This test was carried out with Python, in Goggle Collaboratory.

However, the applicability of this test to our data in a test by lexeme pairs remains unclear. When Lee's classification into twelve registers is tested, Fisher's exact test indicates a significant difference between 4.87% of

the pairs, possibly because the register classification only uses twelve categories, and this test is not reliable to decide whether the difference is significant or not. When the BNC's David Lee's classification into 71 registers is considered, Fisher's exact test indicates a significant difference between 43.81% of the pairs: As a more fine-grained register classification is used and the categorical data are bigger, the test indicates that there is a statistically significant difference between the register use of a larger number of pairs.

The use of a relative percentage difference, e.g. of 10%, was discarded for RR: While it might make sense when the number of registers for both lexemes is large, it can be misleading when the absolute numbers are small. For instance, comparing 50 and 55 registers (10% difference) may be significant because a five-register difference can indicate a notable difference in usage. However, a 10% difference between ten and eleven registers may not be as meaningful because the absolute difference is only one register (even though the relative percentage is 10%).

3.5 SUMMARY

Chapter 3 summarizes the methods used to study directionality in this thesis. This thesis combines the use of dictionary and corpus data, thus, Section 3.2 presented first the main resources used for the study of directionality in this thesis, namely:

i. the OED, and
ii. the BNC.

This section described how these resources were used, first in a pilot study on affixation, and subsequently in the primary investigation of directionality in conversion.

Section 3.3 focused on the pilot study carried out with the aims:

i. to test whether Marchand's (1964) semantic criteria for directionality, along with frequency or register distribution, prove applicable in affixation, and
ii. to evaluate the criteria's applicability at the scale of senses.

Specifically:

i. Section 3.3.1 described the method used for the data collection and selection of a sample of bases and their derivatives by affixation.
ii. Section 3.3.2 described how the analysis of the directionality criteria was carried out in the affixation sample.
iii. Section 3.3.3 described the main results obtained from the pilot study regarding the applicability of the criteria in affixation, and the implications for the study of directionality in conversion.

The description in Section 3.4 is longer as it focuses on the primary study of the thesis. This section described the methods for the study of directionality in a sample of present-day English noun/verb conversion, specifically:

i. Section 3.4.1 described how a list of formally identical noun/verb pairs was compiled from the BNC frequency list, and how the data selected were screened for mistakes.
ii. Section 3.4.2 described the data sampling and the decision to limit the sample to terms at or below frequency 1,000.
iii. Section 3.4.3 described the difficulties that arose during sense classification of the sample's concordances, specifically relating to the use of corpora (Section 3.4.3.1) and dictionary information (Section 3.4.3.2).
iv. Section 3.4.4 described the semantic categories used to classify the senses in this thesis' sample, both for derived senses (3.4.4.1) and base senses (3.4.4.2).
v. Section 3.4.5 described and exemplified the application of several of Marchand's (1964) criteria for directionality to a sample of noun/verb English conversion at the level of sense, namely:
    1. SD (Section 3.4.5.1),
    2. RU (Section 3.4.5.2),
    3. SR (Section 3.4.5.3),
    4. SP (Section 3.4.5.4),
    5. FO (Section 3.4.5.5), and
    6. RR (Section 3.4.5.6).

CHAPTER 4

RESULTS

4.1 INTRODUCTION

The study of directionality in noun/verb conversion opens the door to a wide range of descriptive insights. Chapter 4 focuses on the key findings on the relevance of the criteria for directionality in a sample of present-day English noun/verb conversions, namely, SD, SP, SR, RU, FO and RR.[46] Chapter 4 is organized as follows:

i. Section 4.2 describes and exemplifies how senses were distributed into orders of derivation, to obtain results at the level of sense,
ii. Section 4.3 presents the key findings of the applicability of the criteria, and
iii. Section 4.4 presents the results of the consistency between the direction indicated by the criteria.

[46] In chapters 2 and 3 the criteria appear following the order in Marchand (1964), but in chapters 4 and 5 they do not:

i. The semantic criteria are described first, starting from SD (as the main criterion for Marchand 1964, then followed by SP, SR, and RU, according to their applicability.
ii. The quantitative-distributional criteria follow: first FO and then RR, also according to their applicability.

4.2 DISTRIBUTION OF SENSES INTO ORDERS OF DERIVATION

This thesis bases the study of directionality on the level of sense. For the relevance of the criteria used in assessing directionality, senses were first systematically arranged, related, and ascribed a direction of derivation. Sense organization is based on their denotation, which typically coincides with the analysis of the criteria of SD and SP. However, even when the direction based on the criterion of SD or SP is unclear, a direction is ascribed based on a semantic interpretation. When the senses of the pairs refer to each other and a semantic arrangement is unclear, two analyses were undertaken: Each lexeme was presumed to be the base in each analysis, in order to see which analysis proves relevant for each criteria, and whether these would indicate the same direction or not, e.g. in *whoop*$^{N/V}$, where SD and SP are marked as unclear, but FO, RU, or RR may indicate a direction.

The distribution of senses into orders of derivation results in the following picture for the 226[47] pairs of lexemes of the sample:

i. Of the total of 1487 senses analysed for the lexemes, 488 senses are either nominal or verbal senses categorized as base or extended senses within the same lexeme (N^0 or V^0), and to which no senses of the counterpart lexeme are directly connected,[48] e.g. (cf. Table 4.2.1):

(70) *jog*^{V} OED sense 1a "a. transitive. To shake or move (a heavy body) with a push or jerk; to throw up with a jerk; to shake up".

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[47] Two entries (*incense* and *queer*) were removed because, despite the seeming derivational connection, the OED does not give enough evidence to justify their conversion (on the same footing meaning degree of certainty) as the rest of the entries.

[48] By "senses related *directly* by conversion" this thesis means senses which are analysed as deriving from a specific sense in the pair lexeme, e.g. the following sense for the noun and the verb *belch* are analysed as directly related by conversion:

(67) *belch*^{V} (SOUND EMISSION)
"1. intransitive. To void wind noisily from the stomach through the mouth, to eructate." (OED), e.g. "*Manolo* **belched***, and excused himself.*" (BNC)

(68) *belch*^{N} (INSTANCE/RESULT)
"1. An eructation." (OED), e.g. "*He leered at Robyn, and masked a* **belch** *with the back of his hand*." (BNC)

This is by contrast with senses derived within one of the lexemes, e.g. the following sense for the verb:

(69) *belch*^{V} (MANNER OF SPEAKING)
"2. transitive. To ejaculate, to give vent to; to vent with vehemence or violence (words, feelings). […]" (OED), e.g. "*The thin man sniffed. 'Don't you think you ought to be asking some?' 'I am a qualified physician,'* **belched** *the other. 'I know the answers*.'" (BNC)

ii. 211 senses are nominal or verbal senses marked as extended within the same lexeme in order one (N^1 or V^1), and eight are extended senses in order two (N^2 or V^2). Directly related senses in the counterpart lexeme are found for 27 of the extended senses (12%). That is, senses initially not directly associated with a particular base sense (in N^0 or V^0) but analysed as emerging (e.g. by sense extension) within the presumed derivative by conversion are found to further derive senses in the counterpart (base) lexeme too, e.g. (cf. Table 4.2.3):

(71) *holler*^{N} OED sense 3 "3. spec. in the Southern States of America, a work-song." (ABSTRACT_MUSIC/PRACTICE)

> *holler*^{V} OED sense 3 "Also: to sing a 'holler' (see holler n.1). Occasionally transitive." (PERFORMATIVE)

iii. 798 senses were related in the first derivational order, i.e. the criteria were compared for 399 pairs of senses (N^0>V^1 or V^0>N^1)[49], e.g. (cf. Table 4.2.1):

(72) *jog*^{V} OED sense 4 "4. a. intransitive. To walk or ride with a jolting pace, 'to move with small shocks like those of a low trot' (Johnson); to move on at a heavy or laboured pace, to trudge; hence, to move on, go on, be off. *More recently, to run at a gentle pace (esp. as part of a 'keep-fit' schedule)*." (EXT_MANNER OF MOTION)

> *jog*^{N} OED sense 2 "2. (a) The act of jogging or moving mechanically up and down. *(b) The act of jogging along (see jog v. 4)*; a slow, measured walk, trot, or run; also transferred, e.g. of the rhythm of the verse." (ACTION/EVENT)

iv. 128 senses were related in the second derivational order, i.e. 64 pairs of senses (N^1>V^2 or V^1>N^2), e.g. (cf. Table 4.2.2.):

(73) *picket*^{N} OED sense 4 "a. Military. A small detachment of troops, sent out to watch for the approach of the enemy (also as outlying picket), or held in quarters in readiness for such duty and to guard against sudden attack (also as inlying picket); any detachment of troops sent out to perform a particular duty. Also: a single soldier so employed. Cf. out-picquet n. Earliest in picket guard n. at Compounds 2. In the British Army Regulations spelt piquet. / b. Military colloquial. Short for picket duty n. at Compounds 1b." (HUMAN_COLLECTIVE)

[49] For easier data representation, directions with specification of level of derivation are formalized as N^0>V^1 or V^0>N^1 instead of *Noun-to-Verb* or *Verb-to-Noun*, respectively.

> *picket*^{V} OED 3b “3. Military. b. transitive. To post (soldiers, etc.) as a picket; (also) to occupy, watch, or guard as a picket. Also figurative and in extended use.” (CAUSATIVE/SIMILATIVE)

> > *picket*^{N} OED 5b “[…] (in singular): the act of doing this, or the blockade so formed.” (EVENT)

Tables 4.2.1 to 4.2.3 below exemplify sense distribution by orders of derivation for the pairs *jog*$^{N/V}$, *picket*$^{N/V}$, and *holler*$^{N/V}$:

Table 4.2.1. Sense distribution for *jog*$^{N/V}$ (Verb-to-Noun: senses related by conversion appear in the same row)

V^{0} sense	**Semantic Category**	**N^{1} sense**	**Semantic Category**
1a	CAUSATIVE_MANNER OF MOTION		
1b fig	EXT_FIG_CAUSATIVE_MANNER OF MOTION		
2a	CAUSATIVE_MANNER OF MOTION		
2b	EXT_FIG_CAUSATIVE_MANNER OF MOTION	1 fig	FIG_ACTION/INSTANCE/EVENT
3	MANNER OF MOTION		
4	EXT_MANNER OF MOTION	2	ACTION/EVENT
4c	EXT_FIG_MANNER OF MOTION		

Table 4.2.2. Sense distribution for *picket*$^{N/V}$ (senses related by conversion appear in the same row)

N^{0} sense	**Semantic Category**	**V^{1} sense**	**Semantic Category**	**N^{2} sense**	**Semantic Category**
1a	ARTEFACT	1b	INSTRUMENTAL		
3a	EXT_ARTEFACT				
4	HUMAN_COLLECTIVE	3b	CAUSATIVE/SIMILATIVE	5b	EVENT
5	EXT_HUMAN_COLLECTIVE	4	SIMILATIVE	5c	INSTRUMENT

Table 4.2.3. Sense distribution for *holler*$^{N/V}$ (senses related by conversion appear in the same row)

V^0 sense	**Semantic Category**	**N^1 sense**	**Semantic Category**	**V^2 sense**	**Semantic Category**
1	MANNER OF SPEAKING	1	ACTION/INSTANCE		
		3 (ext/base)	ABSTRACT_ MUSIC/PRACTICE	3	PERFORMATIVE

As Tables 4.2.1 to 4.2.3 show, the distribution of senses into orders of derivation allows too for the identification of senses for which no counterpart sense is found (their SC appears in grey in the tables). These senses add to the SR that the lexemes can cover. However, these senses do not show SD specifically towards any of the senses in the related pair, or a SP typical of a derivative. Thus, only related senses between the pairs are contrasted to identify a direction based on SD, SP, RU, FO, or RR.[50] The results obtained are presented in Section 4.3.

4.3 RESULTS OF THE CRITERIA FOR DIRECTIONALITY

Section 4.3 focuses on the results of the applicability of the criteria for directionality in a sample of 226 noun/verb conversion-related pairs, as follows:

i. Section 4.3.1 focuses on the criterion of semantic dependence (SD),
ii. Section 4.3.2 focuses on semantic pattern (SP),
iii. Section 4.3.4 focuses on semantic range (SR),
iv. Section 4.3.3 focuses on restrictions of usage (RU),
v. Section 4.3.5 focuses on frequency of occurrence (FO), and
vi. Section 4.3.6 focuses on range of registers (RR).

4.3.1 Semantic Dependence (SD)

Section 4.3.1 presents the results of testing SD at sense level comparing the senses by pairs to see if one of the senses shows SD towards the related sense in the counterpart lexeme. As a result of the sense analysis, which classifies senses as i) showing SD (+, and occasionally *+?* when the definitions used

[50] For the criterion of FO senses are checked for possible cases, e.g. where the frequency of occurrence of extended senses is higher than that of the related lexemes.

are not available from the OED and have been supplied ad hoc according to the concordances), and ii) not showing SD (–) or iii) as unclear (*?*; cf. Section 3.4.5.1. for specific examples of the application of the criterion), several options are identified:

i. Noun-to-Verb direction, e.g. *bale*^{N} (THING_ARTEFACT) does not show SD, only the counterpart verb sense (RESULTATIVE) is defined based on the noun:

(74) *bale*^{N} (–) (THING_ARTEFACT)

"A large bundle or package of merchandise, originally of more or less rounded shape; now, spec. a package closely pressed, done up in canvas or other wrapping, and tightly corded or hooped with copper or iron, for transportation." (OED), e.g. "**Bales** *of carpet samples fill the pattern room in time for the deadline*" (BNC)

(75) *bale*^{V} (+) (RESULTATIVE)

"To make up into a bale or bales." (OED), e.g. "*So he gave me a baler and I did all of Ork around about Birsay and Sanday and round the area here and* **baled** *their hay to them. And then he bought another baler and he worked with two balers.*" (BNC)

ii. Verb-to-Noun direction, e.g. *nibble*^{V} (INGESTING) does not show SD, only the counterpart nominal sense is defined based on the verb. (ACTION/INSTANCE):

(76) *nibble*^{V} (–) (INGESTING)

"a. transitive. To take a small bite, or a series of small bites, at or from (a thing); to bite away gradually; to bite tentatively, delicately, playfully, or amorously. Also figurative and in extended use. In quot. a1500 perhaps: to make an attempt at." (OED), e.g. "*He is sitting on the corner of the big table in the kitchen, nodding his head and* **nibbling** *a dry biscuit, as Shirley Esplin, the flautist, explains about her work to him.*" (BNC)

(77) *nibble*^{N} (+) (ACTION/INSTANCE)

"a. The action or an act of nibbling; a small, tentative, delicate, or amorous bite. Often used of the behaviour of fish in response to a lure, piece of bait, etc., whence the figurative use described at sense 1b." (OED), e.g. *Henry did not have to see his thin anxious face, his nervous* **nibble** *at his lower lip or the furtive glance to left and right to know that […]*" (BNC)

iii. Noun-to-Verb or Verb-to-Noun, when the definitions used are not available from the OED and have been supplied ad hoc according to the concordances (+?)[51], e.g *soak*^{N} sense 5b:

(78) *soak*^{N} (+?) (AGENT)

"5b. Fig. One who soaks (in various senses, based on context)" (my definition based on the BNC's concordances), e.g. "*She was told - and believed - that the woman Charles once called 'my old* **soak***' (because she absorbed all his worries) no longer tended to his demands.*" (OED)

iv. Unclear direction (*?*) because, even though a connection is established between the senses, none of them shows strong SD:

(79) *fathom*^{N} (?) (EXT_FIG_MEASURE)

"d. in plural. Depths. literal and figurative. Also in figurative expressions *fathoms deep*, *fathoms down*; cf. Compounds 2." (OED), e.g. "*Elisabeth's feelings were in danger of becoming* **fathoms** *deep in torment.*" (BNC)

(80) *fathom*^{V} (?) (FIG_SIMILATIVE)

"b. To get to the bottom of, dive into, penetrate, see through, thoroughly understand." (OED), e.g. "*Loren was upstairs, engaged in that long getting-ready process that he'd never quite been able to* **fathom**." (BNC)

v. Unclear direction (*?*) because both related senses show SD towards the other to some extent, so a direction cannot be established with certainty based on SD alone:

(81) *assart*^{N} (?) (THING_ARTEFACT_MODIFIED LANDSCAPE or RESULT?)

"1. A piece of forest or waste land converted to arable use by clearing trees, bushes, etc.; a clearing in a forest." (OED), e.g. "*He was often directed to see to the ploughing, tilling and sowing of* **assarts***, waste and other lands belonging to the king in the forest […]*" (BNC)

(82) *assart*^{V} (?) (CAUSATIVE/RESULTATIVE)

"transitive. To convert (forest or waste land) to arable use by clearing trees, bushes, etc. Also occasionally intransitive" (OED), e.g. "*the late Earl of Salisbury was convicted of having* **assarted**

[51] Whether a sense is marked as + or +*?* (showing SD) does not make a difference as for the final analysis because if the counterpart sense does not show SD (–), they are marked as pairs where a direction can be established.

2,300 acres of Brigstock Parks in 1604, destroying the vert and a thousand deer, and enclosing the parks." (BNC)

The results of the analysis of SD were obtained from the total number of pairs of senses indicating either a Noun-to-Verb (N>V) or Verb-to-Noun (V>N) direction for each pair of lexemes in the first order of derivation. The analysis of SD of the entire sample is available as Appendix D.4.3.1. Table 4.3.1.1 shows the interpretation of the analysis of SD by senses for the example pairs in this section (i–iv), based on the number of senses showing SD towards another sense in the pair member.

Table 4.3.1.1. Direction according to SD for pairs of lexemes after sense analysis

Pair	**nPairs by senses**			**Direction**
	UNC (?)	**N>V** (N–/V+)	**V>N** (N–/V+)	
bale$^{N/V}$	0	1	0	N>V
nibble$^{N/V}$	1	0	2	V>N
fathom$^{N/V}$	1	1	0	N>V
assart$^{N/V}$	1	0	0	UNC

The results of the analysis of SD by senses for the 399 pairs of senses identified in the first order of derivation are shown in Table 4.3.1.2:

Table 4.3.1.2. Results of SD by sense

SD by sense pairs in first order of derivation		**Total**	
		nPairs senses	**%**
Applicable	Shows a direction (N>V or V>N)	316	79.2%
Not applicable	Unclear	83	20.8%

As shown in Table 4.3.1.2, after a comparison of the 399 pairs of senses identified in the first order of derivation, SD indicates a direction (Noun-to-Verb or Verb-to-Noun) for 316 pairs (79.2%), but not in 83 pairs of senses (20.8%).

The results of the interpretation of SD for the 226 N/V pairs studied in this thesis after an analysis by senses are shown in Table 4.3.1.3.

Table 4.3.1.3. Results of SD by lexemes-pairs according to a sense analysis

SD	Direction	nPairs	%	Total	
				nPairs	%
Applicable	Noun-to-Verb (N>V)	125	55.31%	193	85.4%
	Verb-to-Noun (V>N)	67	29.65%		
	Two groups of senses (N>V and V>N)	1	0.44%		
Not applicable	Unclear	33	14.6%	33	14.6%

A sense analysis of SD yields the following results for the 226 noun/verb pairs in the sample:

i. SD proves relevant to identify a direction for 193 pairs (85.4%), as confirmed by one or more senses within the pair. Specifically, SD identified a Noun-to-Verb direction for 125 pairs (55.31%) and a Verb-to-Noun direction for 67 pairs (29.65%). For one pair (0.44%), i.e. *fluff*$^{N/V}$, two groups of senses were identified for which SD indicates opposite directions: Some of the senses within the pair appear to be related to another lexeme (*fluff*^{V2}), as indicated in the OED, and this may have influenced the sense development within the pair, and
ii. SD does not prove relevant to identify a direction in 33 pairs (14.6%).

4.3.2 Semantic Pattern (SP)

Section 4.3.2 offers the results of testing SP by senses by comparing the senses in the pairs of lexemes to see if any of the senses shows SP towards another sense in the counterpart lexeme. As a result of the sense analysis, which classifies senses as showing SP (+, occasionally +*?*, as explained in Section 4.3.1), not showing SP (–) or as unclear (*?*) (cf. Section 3.4.5.4. for specific examples of the application of the criterion of SP), several options are identified:

i. Noun-to-Verb direction, e.g. *sludge*^{N} (SUBSTANCE/MATERIAL) does not show SP, only the counterpart verb sense (PRIVATIVE) is defined according to a pattern typical of a derivative:

(83) *sludge*^{N} (–) (SUBSTANCE/MATERIAL)

"2. a. Any earthy or slimy matter or deposit; a mixture of some finely powdered substance and water. spec. Such material formed as waste in various industrial and mechanical processes." (OED), e.g. "*Thus fluorinated gases released into the air by chemical works can get into the sewers as liquids. They enter the* **sludge** *and are spread as fertiliser*." (BNC)

(84) *sludge*^{V} (+) (PRIVATIVE)

"3. To clear from sludge or mud." (OED), e.g. "*Gushers rose from disconnected water pipes, and the Dream matter* **sludged** *instantly*." (BNC)

ii. Verb-to-Noun direction, e.g. *whap*^{V} (CONTACT BY IMPACT) does not show SP, only the counterpart nominal sense is defined according to a pattern typical of a derivative. (INSTANCE):

(85) *whap*^{V} (–) (CONTACT BY IMPACT)

"2. a. transitive. To strike with heavy blows; to beat soundly, flog, thrash, belabour (a person or animal; rarely, an inanimate object). colloquial or vulgar." (OED), e.g. "[…] *won't dare to charge the core unit with knights or other precious troops - if he does the Fanatics will come out and* **whap** *him as he moves*." (BNC)

(86) *whap*^{N} (+) (INSTANCE)

"An act of whopping; a heavy blow or impact; a bump." (OED), e.g. "*It toppled over to the floor with a flat* **whap***! and Jimmy backed off into the centre of the office as Duvall scrambled to his feet at last*." (BNC).

vi. Unclear direction according to SP (*?*) because, even though a relation obtains between the senses, none of them shows SP:

(87) *wanton*^{N} (?) (HUMAN+CHARACTERISTICS)

"2. A lustful or lecherous person; a person inclined to loose or unrestrained sexual conduct; a prostitute; spec. (with possessive) a (man's) mistress. Also (in a milder sense): a flirt." (OED), e.g. "[…] *began on the prosecution side, convinced by what he called the 'orthodox belief that Mary was a* **wanton** *and a murderess*' […]" (BNC).

(88) *wanton*^{V} (?) (MANNER OF ACTION)

"a. intransitive. To pass one's time carelessly; to go idly or heedlessly (up and down, over, through a place). Also with on. Now

rare." (OED), e.g. "[…] *Mr. Williams, sometimes take too much liberty with the world,* **wantoning** *in the sunbeams of a dangerous affluence.*" (BNC).

vii. Pairs for which the direction is unclear (?) because both related senses seem to show a semantic pattern typical of a derivative to some extent, as in e.g. *whoop*$^{N/V}$:

(89) *whoop*^{N} (?) (INSTANCE/RESULT)

"1. A cry of 'whoop', or a shout or call resembling this, used to attract attention, as a summons, or to express derision, defiance, support or encouragement, etc., or (now usually) exuberant excitement […]" (OED), e.g. "*Chaka Khan has been around forever, and recently her trademark* **whoops** *and screams have sounded a little forced.*" (BNC).

(90) *whoop*^{V} (?) (EFFECTIVE_MANNER OF SPEAKING)

"1. a. intransitive. To utter a 'whoop!' or a cry or shout resembling this, typically in order to attract attention, as a summons, or to express derision, defiance, support or encouragement, etc., or (now usually) exuberant excitement. / c. transitive. With direct speech as object: to say or utter (something) with a whoop; to call out or yell excitedly." (OED), e.g. "*A sense of adventure invaded the group, everyone* **whooping** *and yelling as they were flung between towers on their way to Athena Gardens* […]" (BNC).

In (89) vs (90), the direction is marked as unclear, because the possibility for the noun sense to be the derivative (INSTANCE/RESULT) is as possible as for the verb sense to be the derivative (EFFECTIVE_MANNER OF SPEAKING).

The results of the analysis of SP were obtained according to the total number of pairs of senses indicating either a Noun-to-Verb (N>V) or Verb-to-Noun (V>N) direction for each pair of lexemes in the first order of derivation. The analysis of SP for the sample pairs in this thesis is available as Appendix D.4.3.2.

Table 4.3.2.1 presents the interpretation of SP by senses for the example pairs in this section (i–iv), according to the number of senses showing SP in the pair.

Table 4.3.2.1. Direction according to SP for pairs of lexemes after sense analysis

Pair	nPairs by senses			Direction
	UNC (?)	N>V (N–/V+)	V>N (N–/V+)	
sludge$^{N/V}$	0	2	0	N>V
whap$^{N/V}$	0	0	1	V>N
wanton$^{N/V}$	1	0	0	UNC
whoop$^{N/V}$	1	0	0	UNC

The results of the analysis of SP by senses for the 399 pairs of senses identified in the first order of derivation are shown in Table 4.3.2.2:

Table 4.3.2.2. Results of SP by sense

SP by sense pairs in first order of derivation		Total	
		nPairs senses	%
Applicable	Shows a direction (N>V or V>N)	323	80.95%
Not applicable	Unclear	76	19.05%

As shown in Table 4.3.2.2, out of the 399 pairs of senses identified in the first order of derivation, SP indicates a direction (Noun-to-Verb or Verb-to-Noun) for 323 pairs (80.95%), but it does not in 76 pairs of senses (19.05%).

The results of the interpretation of SP for the 226 N/V pairs studied in this thesis after an analysis by senses are shown in Table 4.3.2.3.

Table 4.3.2.3. Results of SP by lexemes-pair according to a sense analysis

SP	Direction	nPairs	%	Total	
				nPairs	%
Applicable	Noun-to-Verb (N>V)	121	53.54%	191	84.51%
	Verb-to-Noun (V>N)	69	30.53%		
	Two groups of senses (N>V and V>N)	1	0.44%		
Not applicable	Unclear	35	15.49%	35	15.49%

A sense analysis of SP yields the following results for the 226 noun/verb pairs in the sample:

i. SP proves relevant to identify a direction for 191 pairs (84.51%). Specifically, SP identified a Noun-to-Verb direction for 121 pairs (53.54%) and a Verb-to-Noun direction for 69 pairs (30.53%). As with the criterion of SD, two groups of senses were identified for one pair (0.44%), *fluff*$^{N/V}$, for which SP indicates opposite directions, and
ii. SP is not relevant to identify a direction in 35 pairs (15.49%).

4.3.3 Semantic Range: Qualitative analysis (SR)

Section 4.3.3. focuses on the results of a qualitative analysis of the criterion of Semantic Range (SR). In this thesis, the SR of a lexeme is compared to its pair member by considering the senses each lexeme has in use (i.e. by senses attested in the BNC). Note that the results of this section are given by lexemes. This is because one can only comment on whether a lexeme has a wider or narrower SR than its paronymous lexeme, if the various senses they can take and their use are considered. Finally, the analysis of SR does not consider obsolete senses or, rather, senses that are not attested in the BNC.

The qualitative results of the analysis of the criterion of SR for the sample of English noun/verb conversion analysed in this thesis are presented in Table 4.3.3 as follows:

i. 'N>V' indicates that the noun shows a wider SR than its verbal counterpart, e.g. *bayonet*^{N} denotes "[a] stabbing instrument of steel, which may be fixed to the muzzle of a musket or rifle; originally its handle was inserted in the mouth of the gun, but it is now secured by a circular band clasping the barrel […]" (OED) (INSTRUMENT), e.g. "*A soldier tried to shove a* **bayonet** *into his throat, but the steel buckled against his adam's apple superconductor.*" (BNC). Extended and metonymic senses are attested for the noun, whereas they are not for the verb (for *bayonet*^{V} only the sense "1. transitive. To stab or pierce with a bayonet." (INSTRUMENTAL) is attested in the OED, e.g. "*He was* **bayoneted** *to death by a soldier in front of two priests who had tried to protect him.*" (BNC)
ii. 'V>N' indicates that the verb shows a wider SR than its nominal counterpart, e.g. *bonk*^{V} denotes a base sense "a. transitive. To strike (something hard or unyielding), esp. with an audible, typically hollow-

sounding, heavy thump; to bump, to bang" (CONTACT BY IMPACT), e.g. "*[…] but one day I took I took a jelly out in a glass dish and it* **bonked** *this thing and the light came on again.*" and an extended slang sense "3. slang. a. transitive. To have sexual intercourse with (a person)." (OED) (EXT_CONTACT BY IMPACT), e.g. "*In an ideal world you'd be able to meet someone at a bus-stop, go for a drink, take them home and* **bonk** *their brains out - and then go home to your girlfriend for dinner.*" (BNC). By contrast, in *bonk*^{N} only the related slang sense "3. slang. An act of sexual intercourse. Cf. bonk v. 3, bonking n. 2." (ACTION/EVENT) is attested in the OED, e.g. "*[…] the usual rather silly collection of schematic cliches by David Hare, follows a similarly leaden pattern. There is the* **bonk** *on the floor, the bonk on the table, the bonk in the bed; lace-top stockings are discreetly displayed, […]*" (BNC).

iii. 'N≳V' indicates that the noun shows a slightly wider or very similar SR than its verbal counterpart, e.g. the SR of *umpire*^{N} and *umpire*^{V} is similar: a specialized use of the noun in law contexts is attested, e.g. "*[…] but the courts have not seen the umpire procedure as an important factor, and the involvement of an* **umpire** *does not turn a reference to an expert into an arbitration.*" (BNC), while the verb presents SIMILATIVE senses which seem to cover only the general uses of the N, as arbitrator in a dispute, e.g. "[…] *help in seeing why debates among Realists, Pluralists, and Structuralists in International Relations are so hard to* **umpire**." (BNC), or as a supervisor in games or contests, e.g. "*The event, run by John Burgess formerly of Anstey County Junior School, was* **umpired** *by volunteers including members of the Alton Ants netball club*." (BNC)

iv. 'V≳N' indicates that the verb shows a slightly wider or very similar SR than its nominal counterpart, e.g. both *joust*^{V} and *joust*^{N} cover similar senses, but one instance of an obsolete sense of the verb is attested in the corpus too "†1. (?) To join, to ally oneself. Obsolete. rare." (OED) (SOCIAL INTERACTION), e.g. "*THE EGLINTON TOURNAMENT Mounted knights in shining armour,* **jousting** *in the lists; lords and ladies clothed in raiment, […]*" (BNC), so the SR of the verbs is interpreted as slightly wider.

v. 'V≈N' indicates that both lexemes in a pair show a similar SR, i.e. their lexemes cover equivalent semantic reference, the difference lying in the categorial meaning alone, e.g. independently of the number of senses, the pair *libel*$^{N/V}$ seems to cover a similar SR.

vi. Last, the label '?/other' indicates that the pair's SR is unclear, among other possible reasons, because the senses in use are influenced by senses of other lexemes, e.g. in the pair *blind*$^{N/V}$, both terms present several senses related to the adjective each. Some of these senses are connected between the verb and the noun, but the SR between the pair is difficult to contrast. As a different example, the terms of *brood*$^{N/V}$ present several senses derived within the lexemes but they are not easily connected.

Examples of the senses for the lexemes in v. or vi. can be found in Appendix C.3.4.3.

Table 4.3.3. Results of a qualitative analysis of SR

SR	Direction	nPairs	%	Total	
				nPairs	%
Applicable	Noun-to-Verb (N>V)	67	29.65%	112	49.56%
	Verb-to-Noun (V>N)	45	19.91%		
Questionable applicability	Noun-to-Verb (N≳V)	17	7.52%	35	15.49%
	Verb-to-Noun (V≳N)	18	7.96%		
Not applicable	N≈V (similar SR)	68	30.09%	79	34.96%
	? (unclear comparison)	11	4.87%		

The results of the analysis of SR reveal the following:

i. For a large number of pairs (n=79, 34.96%), the criterion does not prove relevant to decide on a direction between the pairs, either because their SR is equivalent (30.09%), or because it differs to the extent that a comparison of the lexemes' SR is obscure (4.87%), e.g. for the influence of other lexemes in their sense development.
ii. The applicability of the criterion is questioned in 35 pairs (15.49%). This is because the difference between the SR covered by the terms of the pair cannot be claimed to be different enough to decide on a direction.
iii. The criterion seems reliable only for 112 pairs (49.56%), where the SR covered by the terms of the pairs is indicative of a direction.

4.3.4 Restrictions of Usage (RU)

Initially, this thesis intended first to compare the total number of restricted senses that a pair of lexemes shows and then to analyse RU by considering specific senses. However, two types of analysis at the level of lexeme (considering senses) were discarded because they often led to the identification of an unreliable interpretation of the direction in this thesis' pairs. Specifically, the tests discarded are:

i. the number of restricted senses by pair, and
ii. the percentage of restricted senses out of the total number of senses that a lexeme takes. compared to its counterpart.

Take e.g. the pair *barrack*$^{N/V}$, for which the following OED senses are attested in the BNC:

(91) *barrack*^{N}

Sense 1b. (ARTEFACT/LOCATION) "'A straw-thatched roof supported by four posts, capable of being raised or lowered at pleasure, under which hay is kept.' Bartlett Dict. Americanisms 1848.", e.g. "*On the earth floors of the leaking, palm-thatched* **barrack** *huts dotted around the vast plantation, […]*" (BNC).

Sense 2. (ARTEFACT/LOCATION) "A set of buildings erected or used as a place of lodgement or residence for troops. […] / d. (singular or plural). A large plain building or range of buildings, tenements, or flats in which a number of people are housed; also, any strikingly plain-looking building suggestive of a military barracks. […] ", e.g. "*He picked up the dead man's only possession, a straw mat, and together he and Dong dragged the body out of the* **barrack** *and through the mud towards the jungle half a mile away.*" (BNC)

(92) *barrack*^{V}

Sense 2/1. (ORNATIVE/LOCATIVE) "2. intransitive. To lodge in barracks. / 1. transitive. To provide barracks for; to locate in barracks.", e.g. "*The Reiksguard is* **barracked** *in the comparative comfort of Altdorf, and accompanies the Emperor on campaign and during diplomatic tours*" (BNC)

If the criterion of RU is applied, the following data are obtained:

Table 4.3.4.1. RU analysis for *barrack*$^{N/V}$

Lexeme	nSenses	–RU	+RU	Type
barrack^{N}	2	1	1	RU1
barrack^{V}	2	1		

For the pair *barrack*$^{N/V}$:

i. An analysis of the numbers of senses (nSenses) showing RU whereby the pair with the higher number of senses with restrictions is the derivative yields a Verb-to-Noun direction.
ii. Similarly, an analysis of the number of senses showing RU out of the total number of senses for each lexeme yields, a Verb-to-Noun direction (N: 0.5; V: 0).

Remarkably, both methods are misleading in that they lead to an incorrect interpretation: When the senses and their use are considered, the senses connected directly by conversion are not restricted in use. Also, the restricted nominal sense (1b) is recorded once in the BNC, while sense 2 is recorded 77 times, while the verb sense 2/1 is recorded twice in the BNC (which is probably a better indicator that the verb is not in wider use than the noun).

Thus, because a comparison of RU based on the number of senses showing restrictions in use proved problematic and easily led to the identification of a number of misleading analyses, RU is considered in this thesis specifically by a comparison between related senses in our arrangement into orders of derivation.

The analysis of RU based on the restrictions by pairs of related senses can be found in Appendix D.4.3.4. Table 4.3.4.2 exemplifies the analysis for four pairs.

Table 4.3.4.2. Direction indicated by RU for pairs of lexemes after a comparison of the restrictions by pairs of senses

Pair	No relevance		Relevance		Direction
	BOTH (N+/V+)	**NONE** (N–/V–)	**N>V** (N–/V+)	**V>N** (N–/V+)	
anagram$^{N/V}$	0	0	1	0	N>V
bluster$^{N/V}$	0	3	0	0	UNC
quack$^{N2/V2}$	2	0	0	0	UNC
slit$^{N/V}$	0	1	0	1	V>N

Table 4.3.4.2 presents the pairs' direction based on RU by pairs of senses for the pairs *anagram*$^{N/V}$, *bluster*$^{N/V}$, *quack*$^{N2/V2}$, and *slit*$^{N/V}$. Specifically, the table indicates:

i. Whether sense comparison has no relevance to identify a direction, either because:
   1. both the sense of the noun and the sense of the verb compared are restricted in use, or
   2. none of them is restricted.

ii. Whether sense comparison is relevant to identify a direction because one of the senses is restricted in usage and the related sense is not.

iii. The final outcome (Column six *Direction*) based on this information, e.g. the direction is unclear (*UNC*) for the pair *bluster*$^{N/V}$ because all senses in the two pairs of senses related by conversion show restrictions (+), and it is indicated as Verb-to-Noun (*V>N*) for the pair *slit*$^{N/V}$ because, although there is one pair showing no restrictions of usage (–), the nominal sense in another pair shows restrictions while the counterpart verb sense is unrestricted.

The results of the pairs of senses analysed in the first order of derivation are given in Table 4.3.4.3, and the direction results by RU for lexeme pairs are given in Table 4.3.4.4.

Table 4.3.4.3. Applicability of RU by senses in the first order of derivation

RU by sense pairs in first order of derivation		**nPairs senses**	**%**	**Total**	
				nPairs	**%**
Applicable	Shows a direction (N>V or V>N)	90	22.56%	90	22.56%
Not applicable	Both + RU	76	19.05%	309	77.44%
	Both – RU	233	58.4%		

Overall, the results of the analysis of RU for pairs of senses are as follows:

i. Out of the total of 399 pairs analysed in the first order of derivation (N^0>V^1 or V^1>N^0), RU identifies a direction only for 90 pairs of senses (22.56%).

ii. A direction cannot be established by RU for 309 pairs (77.44%):
    a. in 76 pairs (19.05%) because both senses show restrictions of usage, and
    b. in 233 pairs (58.4%) because none of the senses are restricted.

Table 4.3.4.4. Direction of lexemes according to RU by related senses

RU	Direction	nPairs	%	Total	
				nPairs	%
Applicable	Noun-to-Verb	34	15.04%	69	30.53%
	Verb-to-Noun	35	15.49%		
Not applicable	Unclear	157	69.47%	157	69.47%

The results presented as Table 4.3.4.4 for the analysis of RU for the 226 noun/verb pairs by related senses can be summarized as follows:

i. RU identifies a direction only for 69 pairs (30.53%). Specifically, 34 pairs (15.04%) show Noun-to-Verb direction, and 35 pairs (15.49%) show Verb-to-Noun direction.
ii. RU is not relevant for the remaining 157 pairs (69.47%).

Therefore, it remains unclear whether this analysis proves relevant for directionality.

4.3.5 Frequency of occurrence (FO)

Section 4.3.5 focuses on the results of the criterion of frequency of occurrence (FO) in a sample of noun/verb conversion pairs in the BNC. The results are provided for the applicability of FO at the level of sense. To this end, the BNC concordances were classified into the OED's noun/verb senses first, and wrongly tagged concordances were recategorized where relevant (cf. Section 3.4.3.1), Then, the applicability of FO was tested comparing the frequency of occurrence of the lexemes' senses in the BNC after their distribution into orders of derivation. Table 4.3.5.1 exemplifies the distribution of senses for the pairs *dupe*$^{N2/V2}$,[52] *lesion*$^{N/V}$, *scythe*$^{N/V}$, and *skid*$^{N/V}$, and their frequency.

[52] Note that the subscript in *dupe*$^{N2/V2}$ in the column *pair* and the description in the text do not refer to orders of derivation but to the number of the lexemes' entries as Noun and Verb in the OED.

Table 4.3.5.1. BNC's raw frequency of occurrence for the senses of *dupe*$^{N2/V2}$, *lesion*$^{N/V}$, *scythe*$^{N/V}$, and *skid*$^{N/V}$ by order of derivation. An asterisk is used for repeated senses, i.e. related to more than one sense in the pair. The senses for each pair in the table (as N^0, V^1, N^2) are arranged according to the presumed direction based on their semantics. Senses in the same row are related by conversion. Senses in grey do not have a counterpart

Pair	N^0 sense	Raw freq.	V^1 sense	Raw freq.	N^2 sense	Raw freq.
dupe$^{N2/V2}$	1	5	1	1		
lesion$^{N/V}$	1	189	1	2		
	1 ext	1				
scythe$^{N/V}$	1	67	1b	24	2b	2
	1b	9				
	1c	15				
	1*	67	2	28		
			2 fig	1		
skid$^{N/V}$	1 fig	1				
	2	16				
	2 fig	23				
	3	9	3	196	4	48
			3 fig	2		

These results allow to compare directly related senses by conversion, e.g. sense 1 for *dupe*^{N2} is attested five times in the BNC while the counterpart (sense 1 for *dupe*^{V2}) is attested once. This indicates a Noun-to-Verb direction based on the frequency of the senses. A direction is also clearly established for the pair *lesion*$^{N/V}$ because the noun sense is much more frequent (189 occurrences) than the verb sense (two occurrences) in the BNC.

More complex pairs are represented too because they are polysemous and because subsequent derivation can be found between the senses, as in *scythe*$^{N/V}$ and *skid*$^{N/V}$: Both pairs show senses for which no directly derived sense is found and which in these cases do not seem to be relevant for a FO analysis (in grey font), but they differ regarding the direction indicated by FO. For s*cythe*$^{N/V}$ the direction by FO, if we look at the senses in the first order of derivation, is as expected or aligns with the representation of senses into orders of derivation based on semantics (N^0>V^1). By contrast, the direction shown by FO for *skid*$^{N/V}$ is the opposite (V^0>N^1) and does not align with our semantic analysis.

For a more reliable data interpretation, a Chi-squared test (χ^2) was performed using the Excel function *CHISQ.TEST*. This test fits as it allows to statistically assess whether the observed differences between pairs of senses are significant ($P < 0.05$) or are due to random variation ($P > 0.05$), providing a more robust data-driven approach to evaluating frequency differences. The specific results of the Chi-squared test to analyse the observed differences between the related senses for the pairs exemplified above are shown in Table 4.3.5.2.

Table 4.3.5.2. Analysis of FO for *dupe*$^{N2/V2}$, *lesion*$^{N/V}$, *scythe*$^{N/V}$, and *skid*$^{N/V}$ based on a Chi-squared test. An asterisk is used for repeated senses, i.e. related to more than one sense in the pair lexeme

Pair	N^0 sense	Raw freq.	V^1 sense	Raw freq.	N^2 sense	Raw freq.	Chi^2 (p-value)	Significant difference	Direction
dupe$^{N2/V2}$	1	5	1	1			0.10	No	N>V
lesion$^{N/V}$	1	189	1	2			1.02E-41	Yes	N>V
scythe$^{N/V}$	1	67	1b	24			6.56E-06	Yes	N>V
			1b	24	2b	2	1.60E-05	Yes	V^1>N^2
	1*	67	2	28			6.23E-05	Yes	N>V
skid$^{N/V}$	3	9	3	196			5.53E-39	Yes	V>N
			3	196	4	48	2.67E-21	Yes	V^1>N^2

Results of the analysis of FO were then obtained by considering the number of pairs of senses indicating either Noun-to-Verb (N>V) or Verb-to-Noun (V>N) direction for each pair of lexemes. The direction was established according to the FO analysis by senses in first order of derivation. The analysis of the sample is available as Appendix D.4.3.5. Table 4.3.5.3 presents the results for the pairs exemplified in this section.

Table 4.3.5.3. Direction indicated by FO according to the frequency of occurrence of the senses for each lexeme in the BNC

Pair	Significant difference		No significant difference			Direction	Significant difference
	N>V (nSenses)	N<V (nSenses)	N>V (nSenses)	N<V (nSenses)	N=V (nSenses)		
dupe$^{N2/V2}$	0	0	1	0	0	N>V	No
lesion$^{N/V}$	1	0	0	0	0	N>V	Yes
scythe$^{N/V}$	2	0	0	0	0	N>V	Yes
skid$^{N/V}$	0	1	0	0	0	V>N	Yes

Table 4.3.5.3 presents the number of pairs showing a Noun-to-Verb or Verb-to-Noun direction based on FO for the pairs *dupe*$^{N2/V2}$, *lesion*$^{N/V}$, *scythe*$^{N/V}$, and *skid*$^{N/V}$. The direction analysis is given in Column seven (*Direction*), and the significance of this result is given in the last column (*Significant difference*).

Table 4.3.5.4. Direction by sense according to FO

FO by sense pairs in the first order of derivation		nPairs senses	%	Total	
				nPairs	%
Applicable	Shows a direction (N>V or V>N) (significant difference (Y))	299	74.94%	299	74.94%
Not applicable	No significant difference (N)	90	22.56%	100	25.06%
	Unclear (same freq.)	10	2.51%		

Overall, the results of the analysis of FO by senses in first order of derivation (cf. Table 4.3.5.4) are as follows:

i. A Chi-squared test confirms that, out of the total of 399 pairs analysed in first order of derivation (N^0>V^1 or V^1>N^0), FO identifies a direction for 299 pairs of senses (74.94%, cf. Table 4.3.5.4). The difference observed between these senses is statistically significant.

ii. For 90 pairs of senses (22.56%), a direction may be interpreted because one sense occurs in the BNC more times than its counterpart sense, however, the difference in the frequency of occurrence of the senses is not statistically significant. The criterion of FO is, thus, not applicable where this is the case.

iii. For the remaining ten pairs of senses (2.51%), no direction can be established by FO, because the senses have the same frequency of occurrence in the BNC.

The results of the interpretation of FO for the noun/verb pairs studied in this thesis by senses are presented next.

Table 4.3.5.5. Results of FO by lexeme-pair according to a sense analysis

FO	Direction	nPairs	%	Total	
				nPairs	%
Significant difference (Y)	Noun-to-Verb	115	50.9%	173	76.55%
	Verb-to-Noun	58	25.7%		
Undecided (UND Y)	Noun-to-Verb	6	2.7%	10	4.42%
	Verb-to-Noun	4	1.7%		
No significant difference (N)	Noun-to-Verb	20	8.8%	38	16.81%
	Verb-to-Noun	18	8.0%		
Unclear	N=V (same freq.)	5	2.2%	5	2.21%

A sense analysis of FO yields the following results in the 226 noun/verb pairs in the sample:

i. FO proves relevant to identify a direction in 173 pairs (76.55%), as confirmed by one or more senses with a significant observed frequency difference, as confirmed by a Chi-squared test. Specifically, 115 pairs (50.9%) signal a Noun-to-Verb direction, and 58 pairs (25.7%) signal a Verb-to-Noun direction.

ii. In ten pairs (4.42%), marked in the Table as *Undecided* (UND Y), a similar number of pairs of senses signal a significant difference but an opposite direction, so the direction was decided according to the analysis of the pair of senses with the higher frequency of occurrence within the pair of lexemes. Specifically, the direction thus identified was Noun-to-Verb in six pairs, and Verb-to-Noun in four pairs.

iii. In 38 pairs (16.81%), a direction could be established by FO, but the difference in the frequency of occurrence of the related senses within the pair is not statistically significant. This includes pairs in which two opposite directions are found (no statistically significant difference), and in which the direction is according to the pair of senses with the higher

frequency. As the difference is not significant for these cases the criterion is considered as not applicable in this thesis.

iv. In the remaining five pairs (2.21%), the direction remains unclear according to FO, because the senses have the same frequency of occurrence in the BNC, or because there seem to be two opposite directions as by different pairs of senses, but their frequencies are close.

Although not all represented in Table 4.3.5.5, senses signalling opposite directions were found in 39 pairs. Specifically:

i. in ten pairs (4.42%), marked in the Table as *Undecided*, a similar number of pairs of senses show a significant difference but an opposite direction was found, so the direction is decided according to the analysis of the pair of senses with the higher frequency of occurrence within the pair of lexemes. Specifically, the direction thus identified is Noun-to-Verb in six pairs, and Verb-to-Noun in four pairs,

ii. for four pairs, a similar number of sense pairs were identified by FO as signalling opposite directions, but the difference is not interpreted as statistically significant. These four pairs were classified within (N) according to the pairs of senses with the higher FO,

iii. in nine other pairs, a similar number of senses signalling opposite directions were identified, but some were interpreted as statistically significant and some as not statistically significant. These nine pairs were classified as (Y) according to the direction of the pair with the higher FO, and

iv. in the remaining 16 pairs, a similar number of senses signalling opposite directions were found too, but more than one sense was identified indicating the same direction (and the difference interpreted as significant), whereas only one sense or not any was identified with the opposite direction, the difference between these pairs not being significant anyway. These 16 pairs were classified as (Y) according to the direction of the pair with the higher FO. The pairs showing a higher FO are the ones where Y is found too.

4.3.6 Range of Registers covered (RR)

Section 4.3.6 presents the results of the analysis of the criterion of range of register (RR) in a sample of noun/verb conversion in English. Specifically, this section presents the quantitative results of the analysis of RR at sense level by comparing the number of registers in which the lexemes' senses appear in the BNC after their distribution into orders of derivation. As it is arguable how fine-grained the classification of register usage is to be to yield significant results, RR was considered in two ways (cf. Section 3.4.5.6 for the difference between the two classifications):

i. according to Lee's (2001) classification into twelve main groups of registers or genres, and
ii. according to the BNC's David Lee's classification for corpus data retrieval, which consists of 71 registers or genres.

Table 4.3.6.1. Analysis of RR for *frizz*$^{N/V}$, *huddle*$^{N/V}$, *pauper*$^{N/V}$, *scythe*$^{N/V}$, and *witch*$^{N/V}$, according to Lee's (2001) classification. An asterisk is used for repeated senses, i.e. related to more than one sense in the pair lexeme

Pair	**V^0 sense**	**nReg**	**N^1 sense**	**nReg**	**V^2 sense**	**nReg**	**Fisher's Exact Test (p-value)**	**Significant difference**	**Direction**
frizz$^{N/V}$	1, 2	3	1	2			1	No	V>N
huddle$^{N/V}$	1	2	4	4			0.64	No	N>V
	6, 7	6	1a	3			0.40	No	V>N
			1a	3	3	3	1	No	?
			2	3	3b	2	1	No	N^1>V^2
Pair	**N^0 sense**	**nReg**	**V^1 sense**	**nReg**	**N^2 sense**	**nReg**	**Fisher's Exact Test (p-value)**	**Significant difference**	**Direction**
pauper$^{N/V}$	1	5	1	1			0.15	No	N>V
scythe$^{N/V}$	1	8	1b	4			0.22	No	N>V
			1b	4	2b	1	0.32	No	V^1>N^2
	1*	8	2	2			0.04	Yes	N>V
witch$^{N/V}$	1	10	2	1			0.00064	Yes	N>V
	3	7	3	2			0.09	No	N>V

Table 4.3.6.1 shows the distribution of senses for the pairs *frizz*$^{N/V}$, *huddle*$^{N/V}$, *pauper*$^{N/V}$, *scythe*$^{N/V}$, and *witch*$^{N/V}$, and the number of registers in which each appears in the BNC, following Lee's (2001) classification into twelve registers. The table also shows whether the difference between the number of registers covered by the senses is significant ($P < 0.05$) or not ($P > 0.05$), according to Fisher's Exact Test. The direction appears in the last column. Table 4.3.6.2 shows the analysis of RR for the same pairs following the BNC classification into 71 registers.

Table 4.3.6.2. Analysis of RR for *frizz*$^{N/V}$, *huddle*$^{N/V}$, *pauper*$^{N/V}$, *scythe*$^{N/V}$, and *witch*$^{N/V}$, according to the BNC's classification into 71 registers. An asterisk is used for repeated senses, i.e. related to more than one sense in the pair lexeme

Pair	**V^0 sense**	**nReg**	**N^1 sense**	**nReg**	**V^2 sense**	**nReg**	**Fisher's Exact Test (p-value)**	**Significant difference**	**Direction**
frizz$^{N/V}$	1, 2	4	1	4			1	No	?
huddle$^{N/V}$	1	3	4	7			0.33	No	N>V
	6, 7	27	1a	9			0.0009	Yes	V>N
			1a	9	3	4	0.24	No	N^1>V^2
			2	6	3b	2	0.27	No	N^1>V^2
Pair	**N^0 sense**	**nReg**	**V^1 sense**	**nReg**	**N^2 sense**	**nReg**	**Fisher's Exact Test (p-value)**	**Significant difference**	**Direction**
pauper$^{N/V}$	1	20	1	1			5E-06	Yes	N>V
scythe$^{N/V}$	1	14	1b	9			0.36	No	N>V
			1b	9	2b	1	0.02	Yes	V^1>N^2
	1*	14	2	10			0.50	No	N>V
witch$^{N/V}$	1	37	2	1			6E-13	Yes	N>V
	3	14	3	2			0.0025	Yes	N>V

Although some differences regarding significance levels are found, both analyses seem to signal the same direction of derivation for the example pairs presented in this section.

The results of the analysis of RR were then obtained by considering the number of pairs of senses indicating either Noun-to-Verb or Verb-to-Noun direction for each pair of lexemes, based on the RR analysis by senses

in the first order of derivation. The analysis of the sample, based on the two register classifications used is available as Appendix D.4.3.6. Table 4.3.6.3 shows the results for the pairs exemplified in this section, according to the BNC's classification into 71 registers.

Table 4.3.6.3. Direction indicated by RR according to the number of registers covered by the senses for each lexeme in the BNC in the first order of derivation

Pair	Significant difference (Y)		No significant difference (N)			Direction	Significant difference
	N>V (nSenses)	V>N (nSenses)	N>V (nSenses)	V>N (nSenses)	N=V (nSenses)		
frizz$^{N/V}$	0	0	0	0	1	N>V	No
huddle$^{N/V}$	0	1	1	0	0	V>N	Yes
pauper$^{N/V}$	1	0	0	0	0	N>V	Yes
scythe$^{N/V}$	0	0	2	0	0	N>V	No
witch$^{N/V}$	2	0	0	0	0	V>N	Yes

As table 4.3.6.3 shows, RR did not prove relevant to identify a direction in some pairs of lexemes, e.g. *frizz*$^{N/V}$ because the noun/verb senses appear in the same number of registers in the BNC. In other pairs, a direction is identified, and Fisher's Exact Test proves the difference in the number of registers in which the senses occur to be significant, e.g. *pauper*$^{N/V}$ or *witch*$^{N/V}$. For other pairs, RR signals a direction, but the difference is not significant, e.g. *scythe*$^{N/V}$. Last, an analysis of RR indicates opposite directions in several related pairs of senses, e.g. *huddle*$^{N/V}$. In the latter case, the direction signalled by the pair containing the sense spread over a larger number of registers is taken. Specifically for *huddle*, as shown in Table 4.3.6.2 above, the difference between the pair containing the senses used in a larger number of registers is also statistically significant, while the difference in RR of the other pair is not.

The results of the applicability of RR for the 399 pairs of senses compared in the first order derivation are shown in Table 4.3.6.4 following Lee's (2001) classification into twelve registers and in Table 4.3.6.5 following the BNC classification into 71 registers. Fisher's Exact Test was selected to test whether the difference in RR between the senses is significant, because as mentioned in Section 3.4.5.6, it has been claimed to be more reliable for the estimation of statistical significance for small-size categorical data (Brezina 2018: 113).

Table 4.3.6.4. Direction by sense according to Lee's (2001) classification into twelve registers

RR12 by sense pairs in the first order of derivation		nPairs senses	%	Total	
				nPairs	%
Applicable	Significant difference (Y) (N^0>V^1 or V^0>N^1)	21	5.26	21	5.26
Not applicable	No significant difference (N) (N^0>V^1 or V^0>N^1)	308	77.19	378	94.74%
	Unclear (same nReg)	70	17.54		

Table 4.3.6.5. Direction by sense according to BNC's David Lee's classification into 71 registers

RR71 by sense pairs In the first order of derivation		nPairs senses	%	Total	
				nPairs	%
Applicable	Significant difference (Y) (N^0>V^1 or V^0>N^1)	159	39.85%	159	39.85%
Not applicable	No significant difference (N) (N^0>V^1 or V^0>N^1)	206	51.63%	240	60.15%
	Unclear (same nReg)	34	8.52%		

Overall, for the 399 pairs of senses compared in our sample, RR shows that:

i. If a classification into twelve registers is used (Table 4.3.6.4), RR may be taken as inficating a direction (N^0>V^1 or V^0>N^1) for 329 pairs (82.45%). Of those pairs, however, Fisher's Exact Test confirms a significant difference only in 21 pairs of senses (5.26%). The difference is not statistically significant in 308 pairs of senses (77.19%), and a direction cannot be established based on RR for 70 pairs (17.54%) because the senses appear in the same number of registers in the BNC.

ii. If a classification into 71 registers is used (Table 4.3.6.5), RR may be taken as inficating a direction (N^0>V^1 or V^0>N^1) for 365 pairs (91.48%). Of those pairs, Fisher's Exact Test confirms a significant difference in 159 pairs of senses (39.85%), however, the difference is not statistically significant in 206 pairs of senses (51.63%). A direction cannot be established according to RR for 34 pairs (8.52%) because the senses appear in the same number of registers in the BNC.

As expected, when a more fine-grained classification is used (BNC's classification into 71 registers), a direction can be established between a larger number of pairs and, as the number of categories used for classification is bigger, the test indicates a statistically significant difference between the register use of a larger number of pairs.

The results of the interpretation of RR by senses for the noun/verb pairs studied in this thesis are presented next. Table 4.3.6.6 shows the results of RR according to a sense analysis for the 226 noun/verb in the sample.

Table 4.3.6.6. Lee's (2001) classification: Results of RR by lexeme-pair according to a sense analysis. *nPairs* refers to the number of pairs of lexemes for which a specific direction is interpreted

RR12	**Direction**	**nPairs**	**%**	**Total**	
				nPairs	**%**
Significant difference (Y)	Noun-to-Verb	13	5.75%	18	7.96%
	Verb-to-Noun	5	2.21%		
No significant difference (N)	Noun-to-Verb	97	42.92%	175	77.43%
	Verb-to-Noun	78	34.51%		
Unclear	N=V (same nReg)	33	14.6	33	14.6%

Table 4.3.6.7. David Lee's classification (BNC): Results of RR by lexemes-pairs according to a sense analysis. *nPairs* refers to the number of pairs of lexemes for which a specific direction is interpreted

RR71	**Direction**	**nPairs**	**%**	**Total**	
				nPairs	**%**
Significant difference (Y)	Noun-to-Verb	76	33.63%	116	51.33%
	Verb-to-Noun	40	17.70%		
No significant difference (N)	Noun-to-Verb	50	22.12%	96	42.48%
	Verb-to-Noun	46	20.35%		
Unclear	N=V (same nReg)	14	6.19%	14	6.19%

The applicability of Fisher's exact test to our data remains unclear. When Lee's (2001) classification into twelve registers is tested, Fisher's exact test indicates a significant difference between 7.96% of the pairs (Table 4.2.6.6). When BNC's David Lee's classification into 71 registers is considered (cf. Table 4.2.6.7), Fisher's exact test indicates a significant difference between 116 pairs (51.33%). Again, as a more fine-grained register classification is used and the categorical data are bigger, the test indicates that there is a statistically significant difference between the register use of a larger number of pairs.

If significant levels are overlooked, RR gives the following results:

i. If Lee's (2001) classification into twelve registers is used (Table 4.3.6.6), RR identifies a direction for 193 pairs (85.4%). Specifically, a Noun-to-Verb direction is found for 110 pairs (48.67%), and a Verb-to-Noun direction for 83 pairs (36.72%). A direction cannot be established based on RR for 33 pairs (14.6%): In 32 pairs because the pairs of senses appear in the same number of registers in the BNC, and in one pair, *puff*$^{N/V}$ because pairs of senses indicate opposite directions, but the most frequent sense in both the Verb and the Noun appears in the same number of registers in the BNC, thus, no direction can be established.[53]
ii. If the BNC's classification into 71 registers is used (Table 4.3.6.7), RR indicates a direction for 212 pairs (93.81%). Specifically, a Noun-to-Verb direction is found for 126 pairs (55.75%), and a Verb-to-Noun direction for 86 pairs (38.05%). A direction cannot be established based on RR for 14 pairs (6.19%) because the pairs of senses appear in the same number of registers in the BNC.

A comparison of the results of analysing RR by senses according to two register classifications is provided in Table 4.3.6.8.

[53] Otherwise, when two directions were found by senses, the direction was decided based on the direction indicated by the pair containing the sense appearing in a wider number of registers for the lexemes. This was the case in 14 pairs in the analysis of Lee's (2001) classification, and in seven cases in the BNC's David Lee's classification into 71 registers.

Table 4.3.6.8. Comparison of the results according to two register categorizations of the BNC's concordances. *RR12* is for Lee's (2001) classification into twelve registers, and *RR71* is for BNC's David Lee's classification into 71 registers

RR12 vs RR71	**Direction**	**nPairs**	**%**	**Total**	
				nPairs	**%**
Consistent direction	Noun-to-Verb	104	46.02%	174	76.99%
	Verb-to-Noun	70	30.97%		
Inconsistent direction	RR12 (direction) vs RR71 (unclear)	3	1.33%	41	18.14%
	RR12 (unclear) vs RR71 (direction)	22	9.73%		
	Opposite directions	16	7.08%		
Unresolved direction	RR12 (unclear) and RR71 (unclear)	11	4.87%	11	4.87%

As the comparison in Table 4.3.6.8 shows, both classifications give the same direction for 77% of the data, specifically, Noun-to-Verb (46.02%) or Verb-to-Noun (30.97%). However, they differ for 18.14% of the data. Specifically, the direction of 22 pairs (9.73%) is analysed as unclear based on Lee's (2001) register grouping, while a direction is found based on the BNC's David Lee's classification into 71 registers. The opposite is the case for three pairs (1.33%). Furthermore, the analysis of RR by the two classifications indicates opposite directions for 16 pairs (7.08%).

The results in this section show that various ways to approach the criterion of RR, i.e. considering a wider or narrower register classification, give dissimilar results by senses, as was the case on a comparison by lexemes. The extent to which a comparison of the range of registers covered by the lexemes indicates the correct direction of derivation remains unclear.

Another issue is that, as with FO, although not represented in the tables 4.3.6.6 and 4.3.6.7, sometimes pairs of senses indicating opposite directions were identified for the same pair of lexemes. This is represented in more detail in table 4.3.6.9 for the sample according to David Lee's classification into 71 registers (*RR71*).

Table 4.3.6.9. Analysis of RR71, with specification of the analysis of undecided cases (*UND*). *Y* shows that significant differences are found between pairs of senses, and *N* that the differences are not significant

RR71	**Noun-to-Verb (N>V)**		**Verb-to-Noun (V>N)**	
	nPairs	**%**	**nPairs**	**%**
RR71 (Y)	72	31.86%	30	13.27%
RR71 (N)	47	20.80%	44	19.47%
RR71 (UND Y)	1	0.44%	2	0.88%
RR71 (UND Y/N)	4	1.77%	8	3.54%
RR71 (UND N)	2	0.88%	2	0.88%

Specifically, pairs of senses indicating opposite directions according to RR71, were found for 34 pairs:

i. in three pairs (4.42%), in the Table as *UND Y*, a similar number of pairs of senses show a significant difference but an opposite direction, so the direction is decided according to the analysis of the pair of senses covering the higher number of registers in the BNC. These three pairs are classified within (*Y*) in the Tables above,

ii. in four pairs (*UND N*), senses are identified signalling opposite directions, but the difference is not interpreted as statistically significant in any of the pairs of senses. These four pairs are classified within (N) in the Tables above, according to the pairs of senses covering the higher number of registers (nReg),

iii. in twelve pairs, senses signal opposite directions but some are interpreted as statistically significant and some as not statistically significant. These twelve pairs are classified as (*Y*) according to the direction of the pair with the higher nReg, and

iv. the remaining 15 cases where opposite directions are signalled are cases where more than one pair shows a significant difference, while only one sense (with no significant difference) signals the opposite direction. These 15 pairs are classified as (*Y*) in Table 4.3.6.8, and the tables above.

4.4 CROSS-CRITERIA CONSISTENCY

Section 4.4 offers the results of the consistency across the criteria tested in this thesis by senses. Specifically:

i. Section 4.4.1 is on the consistency between SD and SP
ii. Section 4.4.2 is on the consistency between SD and SR
iii. Section 4.4.3 is on the consistency between SD and RU
iv. Section 4.4.4 is on the consistency between SD and FO
v. Section 4.4.5 is on the consistency between SD and RR
vi. Section 4.4.6 is on the consistency between SP and SR
vii. Section 4.4.7 is on the consistency between SP and RU
viii. Section 4.4.8 is on the consistency between SP and FO
ix. Section 4.4.9 is on the consistency between SP and RR
x. Section 4.4.10 is on the consistency between SR and RU
xi. Section 4.4.11 is on the consistency between SR and FO
xii. Section 4.4.12 is on the consistency between SR and RR
xiii. Section 4.4.13 is on the consistency between RU and FO
xiv. Section 4.4.14 is on the consistency between RU and RR
xv. Section 4.4.15 is on the consistency between FO and RR

Note that, in what follows, consistency levels are provided without specification of whether the criteria eventually identify a clear direction, or not:

i. in the case of SR, because the SR covered by one of the pairs is analysed as slightly wider but close to similar to that of the other pair ($\gtrsim$, cf. Section 4.3.3.), and
ii. in the case of quantitative-distributional criteria, because the difference in FO or RR is interpreted as statistically not significant, according to a Chi-square test and a Fisher's Exact Test, respectively.

Chapter 5 presents data with these specifications too and discusses how different interpretations of the criteria bring forward differences in the consistency levels across criteria (cf. Section 5.3).

4.4.1 Consistency between SD and SP

The results of the consistency between the criteria of SD and SP are shown in Table 4.4.1. The criteria indicate the same direction in 188 pairs (83.19%),

specifically, they agree on a Noun-to-Verb direction in 121 pairs (53.54%), and a Verb-to-Noun direction in 67 pairs (29.65%), while only one of the criteria seems to offer a direction in six other pairs (2.65%). None of the criteria can be confidently analysed as indicating a direction in the remaining 32 pairs (14.16%).

Table 4.4.1. Consistency between SD and SP by sense

SD vs SP	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	121	53.54%	188	83.19%
	Verb-to-Noun	67	29.65%		
Inconsistent direction	SD (direction) vs SP (unclear)	4	1.77%	6	2.65%
	SD (unclear) vs SP (direction)	2	0.88%		
Unresolved direction	SD (unclear) and SP (unclear)	32	14.16%	32	14.16%

4.4.2 Consistency between SD and SR

The results of the consistency between the criteria of SD and SR are shown in Table 4.4.2. The criteria indicate the same direction in 103 pairs (45.58%), specifically, a Noun-to-Verb direction in 66 pairs (29.20%) and a Verb-to-Noun direction in 37 pairs (16.37%).

The directionality results of the criteria of SD and SR disagree in 112 pairs (49.56%). When this is the case:

i. both criteria indicate opposite directions in 19 pairs (8.41%),
ii. SD indicates a direction but the analysis of SR is unclear in 69 pairs (30.53%), and
iii. the direction based on SD is unclear but SR indicates a direction in 24 pairs (10.62%).

None of the criteria can be confidently analysed as indicating a direction in the remaining eleven pairs (4.87%).

Table 4.4.2. Consistency between SD and SR by sense

SD vs SR	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	66	29.20%	103	45.58%
	Verb-to-Noun	37	16.37%		
Inconsistent direction	SD (direction) vs SR (unclear)	69	30.53%	112	49.56%
	SD (unclear) vs SR (direction)	24	10.62%		
	Opposite directions	19	8.41%		
Unresolved direction	SD (unclear) and SR (unclear)	11	4.87%	11	4.87%

Note that the consistency results in Table 4.4.2 represent all cases where SR is applicable to identify a direction, independently of the degree of confidence with which SR identifies a direction (cf. Section 4.3.3). Differences in the consistency results between SD and SR, where cases of questionable applicability of SR are excluded, are commented on in Section 5.3.3 (cf. Tables 5.3.3.1 and 5.3.3.2).

4.4.3 Consistency between SD and RU

The results of the consistency between the criteria of SD and RU are shown in Table 4.4.3. These criteria indicate the same direction in 48 pairs (21.24%), specifically, a Noun-to-Verb direction in 30 pairs (13.27%) and a Verb-to-Noun direction in 18 pairs (7.96%).

The directionality results of the criteria of SD and RU disagree in 153 pairs (67.7%). When this is the case:

i. both criteria indicate opposite directions in 13 pairs (5.75%),
ii. SD indicates a direction but the analysis of RU is unclear in 131 pairs (57.96%), and
iii. the direction based on SD is unclear but RU indicates a direction in nine pairs (3.98%).

None of the criteria can be confidently analysed as indicating a direction in the remaining 25 pairs (11.06%).

Table 4.4.3. Consistency between SD and RU by sense

SD vs RU	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	30	13.27%	48	21.24%
	Verb-to-Noun	18	7.96%		
Inconsistent direction	SD (direction) vs RU (unclear)	131	57.96%	153	67.7%
	SD (unclear) vs RU (direction)	9	3.98%		
	Opposite directions	13	5.75%		
Unresolved direction	SD (unclear) and RU (unclear)	25	11.06%	25	11.06%

4.4.4 Consistency between SD and FO

The results of the consistency between the criteria of SD and FO are shown in Table 4.4.3. The criteria indicate the same direction in 147 pairs (65.04%), specifically, a Noun-to-Verb direction in 102 pairs (45.13%) and a Verb-to-Noun direction in 45 pairs (19.91%).

The directionality results of the criteria of SD and FO disagree in 78 pairs (34.51%). When this is the case:

i. both criteria indicate opposite directions in 43 pairs (19.03%),
ii. SD indicates a direction but the analysis of FO is unclear in three pairs (1.33%), and
iii. the direction based on SD is unclear but FO indicates a direction in 32 pairs (14.16%).

None of the criteria give a direction for one remaining pair (0.44%). Note that the consistency results in Table 4.4.4 represent all cases where FO is applicable to identify a direction, regardless of whether the difference by which the direction is identified is significant or not (cf. Section 4.3.5). Differences in the consistency results between SD and FO where significance levels are set for FO are commented on in Section 5.3.5 (cf. Table 5.3.5.1 and 5.3.5.2).

Table 4.4.4. Consistency between SD and FO by sense

SD vs FO	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	102	45.13%	147	65.04%
	Verb-to-Noun	45	19.91%		
Inconsistent direction	SD (direction) vs FO (unclear)	3	1.33%	78	34.51%
	SD (unclear) vs FO (direction)	32	14.16%		
	Opposite directions	43	19.03%		
Unresolved direction	SD (unclear) and FO (unclear)	1	0.44%	1	0.44%

4.4.5 Consistency between SD and RR

The results of the consistency between the criteria of SD and RR are shown in Tables 4.4.5.1 and 4.4.5.2, according to Lee's (2001) classification into twelve registers and according to BNC's David Lee's classification into 71 registers, respectively.

Specifically, the comparison of SD with RR using Lee's (2001) classification into twelve registers shows that the criteria indicate the same direction in 124 pairs (54.87%): Noun-to-Verb direction in 83 pairs (36.73%), and Verb-to-Noun direction in 41 pairs (18.14%).

The directionality results disagree in 93 pairs (41.15%) in that:

i. both criteria indicate opposite directions in 45 pairs (19.91%),
ii. SD indicates a direction but the analysis of RR is unclear for 24 pairs (10.62%), and
iii. the direction based on SD is unclear but RR indicates a direction in 28 pairs (12.39%).

None of the criteria give a direction in the remaining nine pairs (3.98%).

Table 4.4.5.1. Consistency between SD and RR by sense according to Lee's (2001) classification into twelve registers

SD vs RR12	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	83	36.73%	124	54.87%
	Verb-to-Noun	41	18.14%		
Inconsistent direction	SD (direction) vs RR12 (unclear)	24	10.62%	93	41.15%
	SD (unclear) vs RR12 (direction)	28	12.39%		
	Opposite directions	45	19.91%		
Unresolved direction	SD (unclear) and RR12 (unclear)	9	3.98%	9	3.98%

The comparison of SD with RR according to the BNC's retrieval classification into 71 registers shows that the criteria indicate the same direction in 135 pairs (59.73%): a Noun-to-Verb direction in 93 pairs (41.15%) and a Verb-to-Noun direction in 42 pairs (18.58%).

The directionality results disagree for 88 pairs (38.94%) in that:

i. both criteria indicate opposite directions in 47 pairs (20.8%),
ii. SD indicates a direction but the analysis of RR is unclear in eleven pairs (4.87%), and
iii. the direction based on SD is unclear but RR indicates a direction in 30 pairs (13.27%).

None of the criteria give a direction for three pairs (1.33%).

As shown by the tables, the comparison with one or the other register classifications differs mainly in that the number of unclear pairs when the classification into a higher number of registers is used is lower, and the percentage of agreement between SD and RR is higher.

Table 4.4.5.2. Consistency between SD and RR by sense according to BNC's David Lee's classification into 71 registers

SD vs RR71	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	93	41.15%	135	59.73%
	Verb-to-Noun	42	18.58%		
Inconsistent direction	SD (direction) vs RR71 (unclear)	11	4.87%	88	38.94%
	SD (unclear) vs RR71 (direction)	30	13.27%		
	Opposite directions	47	20.8%		
Unresolved direction	SD (unclear) and RR71 (unclear)	3	1.33%	3	1.33%

Note that the consistency results in Table 4.4.5.2 represent all cases where RR71 is applicable to identify a direction, independently of whether the difference by which such direction is identified is significant or not (cf. Section 4.3.6). Differences in the consistency results between SD and RR71 where significance levels are established for RR71 are further commented on in Section 5.3.6 (cf. Tables 5.3.6.1 and 5.3.6.2).

4.4.6 Consistency between SP and SR

The results of the consistency between the criteria of SP and SR are shown in Table 4.4.6. These criteria indicate the same direction in 102 pairs (45.13%), specifically, a Noun-to-Verb direction in 65 pairs (28.76%), and a Verb-to-Noun direction in 37 pairs (16.37%).

The directionality results of the criteria of SP and SR disagree in 112 pairs (49.56%). When this is the case:

i. both criteria indicate opposite directions in 20 pairs (8.85%),
ii. SP indicates a direction but the analysis of SR is unclear in 68 pairs (30.09%); and
iii. the direction based on SP is unclear but SR indicates a direction in 24 pairs (10.62%).

None of the criteria can be confidently analysed as indicating a direction for the remaining twelve pairs (5.31%).

Table 4.4.6. Consistency between SP and SR by sense

SP vs SR	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	65	28.76%	102	45.13%
	Verb-to-Noun	37	16.37%		
Inconsistent direction	SP (direction) vs SR (unclear)	68	30.09%	112	49.56%
	SP (unclear) vs SR (direction)	24	10.62%		
	Opposite directions	20	8.85%		
Unresolved direction	SP (unclear) and SR (unclear)	12	5.31%	12	5.31%

Note that the consistency results in Table 4.4.6 represent all cases where SR is applicable to identify a direction, independently of the degree of confidence with which SR identifies a direction (cf. Section 4.3.3). Differences in the consistency results between SP and SR, where cases of questionable applicability of SR are excluded, are commented on in Section 5.3.3 (cf. Tables 5.3.3.1 and 5.3.3.3).

4.4.7 Consistency between SP and RU

The results of the consistency between the criteria of SP and RU are shown in Table 4.4.7. The criteria indicate the same direction in 45 pairs (19.91%), specifically, a Noun-to-Verb direction in 28 pairs (12.39%), and a Verb-to-Noun direction in 17 pairs (7.52%).

The directionality results of the criteria of SP and RU disagree in 157 pairs (69.47%). When this is the case:

i. both criteria indicate an opposite direction in twelve pairs (5.31%),
ii. SP indicates a direction but the analysis of RU is unclear in 133 pairs (58.41%), and
iii. the direction based on SP is unclear but RU indicates a direction in twelve pairs (5.31%).

None of the criteria can be confidently analysed as indicating a direction for the remaining 24 pairs (10.62%).

Table 4.4.7. Consistency between SP and RU by sense

SP vs RU	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	28	12.39%	45	19.91%
	Verb-to-Noun	17	7.52%		
Inconsistent direction	SP (direction) vs RU (unclear)	133	58.85%	157	69.47%
	SP (unclear) vs RU (direction)	12	5.31%		
	Opposite directions	12	5.31%		
Unresolved direction	SP (unclear) and RU (unclear)	24	10.62%	24	10.62%

4.4.8 Consistency between SP and FO

The results of the consistency between the criteria of SP and FO are shown in Table 4.4.8. These criteria indicate the same direction in 145 pairs (64.16%), specifically, a Noun-to-Verb direction in 100 pairs (44.25%), and a Verb-to-Noun direction in 45 pairs (19.91%).

The directionality results of the criteria of SP and FO disagree for 80 pairs (35.4%). When this is the case:

i. both criteria indicate opposite directions in 43 pairs (19.03%),
ii. SP indicates a direction but the analysis of FO is unclear in three pairs (1.33%), and
iii. the direction based on SP is unclear but FO indicates a direction in 34 other pairs (15.04%).

None of the criteria give a direction for one remaining pair (0.44%).

Note that the consistency results in Table 4.4.8 represent all cases where FO is applicable to identify a direction, independently of whether the difference by which the direction is identified is significant or not (cf. Section 4.3.5). Differences in the consistency results between SP and FO where significance levels are set are commented on in Section 5.3.5 (cf. Tables 5.3.5.1 and 5.3.5.3).

Table 4.4.8. Consistency between SP and FO by sense

SP vs FO	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	100	44.25%	145	64.16%
	Verb-to-Noun	45	19.91%		
Inconsistent direction	SP (direction) vs FO (unclear)	3	1.33%	80	35.4%
	SP (unclear) vs FO (direction)	34	15.04%		
	Opposite directions	43	19.03%		
Unresolved direction	SP (unclear) and FO (unclear)	1	0.44%	1	0.44%

4.4.9 Consistency between SP and RR

The results of the consistency between the criteria of SP and RR are shown in Tables 4.4.9.1 and 4.4.9.2, according to Lee's (2001) classification into twelve registers and BNC's David Lee's classification into 71 registers, respectively.

The comparison of SP with RR using Lee's (2001) classification into twelve registers shows that the criteria indicate the same direction in 123 pairs (54.42%): a Noun-to-Verb direction in 82 pairs (36.28%), and a Verb-to-Noun direction in 41 pairs (18.14%).

The directionality results disagree in 94 pairs (41.59%) in that:

i. both criteria indicate opposite directions in 44 pairs (19.47%),
ii. SP indicates a direction but the analysis of RR is unclear in 24 pairs (10.62%), and
iii. the direction based on SP is unclear but RR indicates a direction in 26 pairs (11.5%).

None of the criteria give a direction for the remaining nine pairs (3.98%).

Table 4.4.9.1. Consistency between SP and RR by sense according to Lee's (2001) classification into twelve registers

SP vs RR12	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	82	36.28%	123	54.42%
	Verb-to-Noun	41	18.14%		
Inconsistent direction	SP (direction) vs RR12 (unclear)	24	10.62%	94	41.59%
	SP (unclear) vs RR12 (direction)	26	11.5%		
	Opposite directions	44	19.47%		
Unresolved direction	SP (unclear) and RR12 (unclear)	9	3.98%	9	3.98%

The comparison of SD with RR according to the BNC's retrieval classification into 71 registers shows that the criteria indicate the same direction in 133 pairs (58.85%): a Noun-to-Verb direction in 91 pairs (40.27%), and a Verb-to-Noun direction in 42 pairs (18.58%).

The directionality results disagree in 91 pairs (40.27%) in that:

i. both criteria indicate opposite directions in 46 pairs (20.35%),
ii. SP indicates a direction but the analysis of RR is unclear in twelve pairs (5.31%), and
iii. the direction based on SP is unclear but RR indicates a direction in 33 pairs (14.6%).

None of the criteria give a direction for two remaining pairs (0.88%).

As shown by the tables, the comparison with one or the other register classifications differs mainly in that the number of unclear classes from the classification into a higher number of registers is lower, and the percentage of agreement between SP and RR is higher.

Table 4.4.9.2. Consistency between SP and RR by sense according to BNC's David Lee's classification into 71 registers

SP vs RR71	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	91	40.27%	133	58.85%
	Verb-to-Noun	42	18.58%		
Inconsistent direction	SP (direction) vs RR71 (unclear)	12	5.31%	91	40.27%
	SP (unclear) vs RR71 (direction)	33	14.6%		
	Opposite directions	46	20.35%		
Unresolved direction	SP (unclear) and RR71 (unclear)	2	0.88%	2	0.88%

Note that the consistency results in Tables 4.4.9.1 and 4.4.9.2 represent all cases where RR is applicable to identify a direction, independently of whether the difference by which the direction is identified is significant or not (cf. Section 4.3.6). Differences in the consistency results between SP and RR71 where significance levels are set for RR71 are commented on in Section 5.3.6 (cf. Tables 5.3.6.1 and 5.3.6.3).

4.4.10 Consistency between SR and RU

The results of the consistency between the criteria of SR and RU are shown in Table 4.4.10. The criteria indicate the same direction in 35 pairs (15.49%), specifically, a Noun-to-Verb direction in 19 pairs (8.41%), and a Verb-to-Noun direction in 16 pairs (7.08%).

The directionality results of the criteria of SR and RU disagree in 134 pairs (59.29%). When this is the case:

i. both criteria indicate an opposite direction for twelve pairs (5.31%),
ii. SR indicates a direction but the analysis of RU is unclear in 99 pairs (43.81%), and
iii. the direction based on SR is unclear but RU indicates a direction in 23 pairs (10.18%).

None of the criteria can be confidently analysed as indicating a direction in the remaining 57 pairs (25.22%).

Table 4.4.10. Consistency between SR and RU by sense

SR vs RU	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	19	8.41%	35	15.49%
	Verb-to-Noun	16	7.08%		
Inconsistent direction	SR (direction) vs RU (unclear)	99	43.81%	134	59.29%
	SR (unclear) vs RU (direction)	23	10.18%		
	Opposite directions	12	5.31%		
Unresolved direction	SR (unclear) and RU (unclear)	57	25.22%	57	25.22%

Note that the consistency results in Table 4.4.10 represent all cases where SR is applicable to identify a direction, independently of the degree of confidence with which SR identifies a direction (cf. Section 4.3.3). Differences in the consistency results between SR and RU, where cases of questionable applicability of SR are excluded, are commented on in Section 5.3.4 (cf. Tables 5.3.4.1 and 5.3.4.4).

4.4.11 Consistency between SR and FO

The results of the consistency between the criteria of SR and FO are shown in Table 4.4.11. These criteria indicate the same direction in 109 pairs (48.23%), specifically, a Noun-to-Verb direction in 66 pairs (29.20%), and a Verb-to-Noun direction in 43 pairs (19.03%).

The directionality results of the criteria of SR and FO disagree in 116 pairs (51.33%). When this is the case:

i. both criteria indicate opposite directions in 34 pairs (15.04%),
ii. SR indicates a direction but the analysis of FO is unclear in three pairs (1.33%), and
iii. the direction based on SR is unclear but FO indicates a direction in 79 pairs (34.96%).

None of the criteria give a direction in one pair (0.44%).

Table 4.4.11. Consistency between SR and FO by sense

SR vs FO	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	66	29.20%	109	48.23%
	Verb-to-Noun	43	19.03%		
Inconsistent direction	SR (direction) vs FO (unclear)	3	1.33%	116	51.33%
	SR (unclear) vs FO (direction)	79	34.96%		
	Opposite directions	34	15.04%		
Unresolved direction	SR (unclear) and FO (unclear)	1	0.44%	1	0.44%

Note that the consistency results in Table 4.4.11 represent all cases where SR and FO are applicable to identify a direction, independently of whether the difference by which the direction is identified (by FO) is significant or not (cf. Section 4.3.5), or the degree of confidence with which SR identifies a direction (cf. Section 4.3.3). Differences in the consistency results between SR and FO where significance levels are set for FO, and cases of questionable applicability of SR are excluded, are commented on in Section 5.3.5 (cf. Tables 5.3.5.1 and 5.3.5.4).

4.4.12 Consistency between SR and RR

The results of the consistency between the criteria of SR and RR are shown in Tables 4.4.12.1 and 4.4.12.2, according to Lee's (2001) classification into twelve registers and BNC's David Lee's classification into 71 registers, respectively.

The comparison of SR with RR according to Lee's (2001) classification into twelve registers shows that the criteria indicate the same direction in 98 pairs (43.36%): a Noun-to-Verb direction in 57 pairs (25.22%), and a Verb-to-Noun direction in 41 pairs (18.14%).

The directionality results disagree in 113 pairs (50%) in that:

i. both criteria indicate opposite directions for 30 pairs (13.27%),
ii. SR indicates a direction but the analysis of RR is unclear in 18 pairs (7.96%), and

iii. the direction based on SR is unclear but RR indicates a direction in 65 pairs (28.76%).

None of the criteria give a direction for the remaining 15 pairs (6.64%).

Table 4.4.12.1. Consistency between SR and RR by sense according to Lee's (2001) classification into twelve registers

SR vs RR12	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	57	25.22%	98	43.36%
	Verb-to-Noun	41	18.14%		
Inconsistent direction	SR (direction) vs RR12 (unclear)	18	7.96%	113	50.00%
	SR (unclear) vs RR12 (direction)	65	28.76%		
	Opposite directions	30	13.27%		
Unresolved direction	SR (unclear) and RR12 (unclear)	15	6.64%	15	6.64%

The comparison of SR with RR according to the BNC's David Lee's classification into 71 registers shows that the criteria indicate the same direction in 101 pairs (44.69%): a Noun-to-Verb direction in 60 pairs (26.55%), and a Verb-to-Noun direction in 41 pairs (18.14%). The directionality results disagree in 117 pairs (51.77%) in that:

i. both criteria indicate opposite directions in 39 pairs (17.26%),
ii. SR indicates a direction but the analysis of RR is unclear in six pairs (2.65%), and
iii. the direction based on SR is unclear but RR indicates a direction in 72 pairs (31.86%).

None of the criteria give a direction in the remaining eight pairs (3.54%).

Table 4.4.12.2. Consistency between SR and RR by sense according to BNC's David Lee's classification into 71 registers

SR vs RR71	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	60	26.55%	101	44.69%
	Verb-to-Noun	41	18.14%		
Inconsistent direction	SR (direction) vs RR71 (unclear)	6	2.65%	117	51.77%
	SR (unclear) vs RR71 (direction)	72	31.86%		
	Opposite directions	39	17.26%		
Unresolved direction	SR (unclear) and RR71 (unclear)	8	3.54%	8	3.54%

Note that the consistency results in Tables 4.4.12.1 and 4.4.12.2 represent all cases where SR and RR are applicable to identify a direction, independently of whether the difference by which the direction is identified (by RR71) is significant or not (cf. Section 4.3.6), or the degree of confidence with which SR identifies a direction (cf. Section 4.3.3). Differences in the consistency results between SR and RR71 where significance levels are set for RR71, and where cases of questionable applicability of SR are excluded, are commented on in Section 5.3.6 (cf. Tables 5.3.6.1 and 5.3.6.4).

4.4.13 Consistency between RU and FO

The results of the consistency between the criteria of RU and FO are shown in Table 4.4.13. These criteria indicate the same direction in 51 pairs (22.57%), specifically, a Noun-to-Verb direction in 31 pairs (13.72%), and a Verb-to-Noun direction in 20 pairs (8.85%).

The directionality results of the criteria of RU and FO disagree in 171 pairs (75.66%), specifically, they indicate an opposite direction in 19 pairs (8.41%), otherwise, the direction according to RU is unclear but FO indicates a direction in 152 pairs (67.26%). None of the criteria indicate a direction in the remaining four pairs (1.77%).

Table 4.4.13. Consistency between RU and FO by sense

RU vs FO	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	31	13.72%	51	22.57%
	Verb-to-Noun	20	8.85%		
Inconsistent direction	RU (unclear) vs FO (direction)	152	67.26%	171	75.66%
	Opposite directions	19	8.41%		
Unresolved direction	RU (unclear) and FO (unclear)	4	1.77%	4	1.77%

Note that the consistency results in Tables 4.4.14.1 and 4.4.14.2 represent all cases where FO is applicable to identify a direction, independently of whether the difference by which the direction is identified (by FO) is significant or not (cf. Section 4.3.5). Differences in the consistency results between RU and FO, where significance levels are set for FO, are commented on in Section 5.3.5 (cf. Tables 5.3.5.1 and 5.3.5.5).

4.4.14 Consistency between RU and RR

The results of the consistency between the criteria of RU and RR are shown in Tables 4.4.14.1 and 4.4.14.2, using Lee's (2001) classification into twelve registers and BNC's David Lee's classification into 71 registers, respectively.

The comparison of RU with RR according to Lee's (2001) classification into twelve registers shows that the criteria indicate the same direction in 44 pairs (19.47%): a Noun-to-Verb direction in 26 pairs (11.50%), and a Verb-to-Noun direction in 18 pairs (7.96%).

The directionality results disagree in 157 pairs (69.47%) in that:

i. both criteria indicate opposite directions in 13 pairs (5.75%),
ii. RU indicates a direction but the analysis of RR is unclear in eight pairs (3.54%), and
iii. the direction based on RU is unclear but RR indicates a direction in 131 pairs (57.96%).

None of the criteria give a direction in the remaining 25 pairs (11.06%).

Table 4.4.14.1. Consistency between RU and RR by sense according to Lee's (2001) classification into twelve registers

RU vs RR12	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	26	11.50%	44	19.47%
	Verb-to-Noun	18	7.96%		
Inconsistent direction	RU (direction) vs RR12 (unclear)	8	3.54%	157	69.47%
	RU (unclear) vs RR12 (direction)	131	57.96%		
	Opposite directions	13	5.75%		
Unresolved direction	RU (unclear) and RR12 (unclear)	25	11.06%	25	11.06%

The comparison of RU with RR according to BNC's David Lee's classification into 71 registers shows that the criteria indicate the same direction in 50 pairs (22.12%): a Noun-to-Verb direction in 29 pairs (12.83%), and a Verb-to-Noun direction in 21 pairs (9.29%).

The directionality results disagree in 165 pairs (73.01%) in that:

i. both criteria indicate opposite directions in 17 pairs (7.52%),
ii. RU indicates a direction but the analysis of RR is unclear in three pairs (1.33%), and
iii. the direction based on RU is unclear but RR indicates a direction in 145 pairs (64.16%).

None of the criteria give a direction in the remaining 29 pairs (12.83%).

Table 4.4.14.2. Consistency between RU and RR by sense according to BNC's David Lee's classification into 71 registers

RU vs RR71	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	29	12.83%	50	22.12%
	Verb-to-Noun	21	9.29%		
Inconsistent direction	RU (direction) vs RR71 (unclear)	3	1.33%	165	73.01%
	RU (unclear) vs RR71 (direction)	145	64.16%		
	Opposite directions	17	7.52%		
Unresolved direction	RU (unclear) and RR71 (unclear)	29	12.83%	29	12.83%

The low degree of agreement between the criteria evidences the low applicability of the criterion of RU.

Note that the consistency results in Tables 4.4.14.1 and 4.4.14.2 represent all cases where RR is applicable to identify a direction, independently of whether the difference by which the direction is identified (by RR) is significant or not (cf. Section 4.3.6). Differences in the consistency results between SD and RR71, where significance levels are set for RR71, are commented on in Section 5.3.6 (cf. Tables 5.3.6.1 and 5.3.6.2).

4.4.15 Consistency between FO and RR

The results of the consistency between the criteria of FO and RR are shown in Tables 4.4.15.1 and 4.4.15.2, according to Lee's (2001) classification into twelve registers and BNC's David Lee's classification into 71 registers, respectively.

The comparison of FO with RR according to Lee's (2001) classification into twelve registers shows that the criteria indicate the same direction in 164 pairs (72.57%): a Noun-to-Verb direction in 103 pairs (45.58%), and a Verb-to-Noun direction in 61 pairs (26.99%).

The directionality results disagree in 59 pairs (26.11%) in that:

i. both criteria indicate opposite directions in 28 pairs (12.39%),
ii. FO indicates a direction but the analysis of RR is unclear in 30 pairs (13.27%), and
iii. the direction based on FO is unclear but RR indicates a direction for one pair (0.44%).

None of the criteria give a direction in the remaining three pairs (1.33%).

Table 4.4.15.1. Consistency between FO and RR by sense according to Lee's (2001) classification into twelve registers

FO vs RR12	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	103	45.58%	164	72.57%
	Verb-to-Noun	61	26.99%		
Inconsistent direction	RR12 (direction) vs FO (unclear)	1	0.44%	59	26.11%
	RR12 (unclear) vs FO (direction)	30	13.27%		
	Opposite directions	28	12.39%		
Unresolved direction	RR12 (unclear) and FO (unclear)	3	1.33%	3	1.33%

The comparison of RU with RR according to BNC's David Lee's classification into 71 registers shows that the criteria indicate the same direction in 194 pairs (85.84%): a Noun-to-Verb direction in 121 pairs (53.54%), and a Verb-to-Noun direction in 73 pairs (32.30%).

The directionality results disagree in 29 pairs (12.83%) in that:

i. both criteria indicate opposite directions in 17 pairs (7.52%),
ii. FO indicates a direction but the analysis of RR is unclear in eleven pairs (4.87%), and
iii. the direction based on FO is unclear but RR indicates a direction in one pair (0.44%).

None of the criteria give a direction in the remaining three pairs (1.33%).

Table 4.4.15.2. Consistency between FO and RR by sense according to BNC's David Lee's classification into 71 registers

FO vs RR71	Direction	nPairs	%	Total	
				nPairs	%
Consistent direction	Noun-to-Verb	121	53.54%	194	85.84%
	Verb-to-Noun	73	32.30%		
Inconsistent direction	RR71 (direction) vs FO (unclear)	1	0.44%	29	12.83%
	RR71 (unclear) vs FO (direction)	11	4.87%		
	Opposite directions	17	7.52%		
Unresolved direction	RR71 (unclear) and FO (unclear)	3	1.33%	3	1.33%

The high degree of agreement between the criteria, especially when a more fine-grained classification into registers is used, was expected in that, the more frequent a sense is, the more likely it is to occur in more registers.

Note that the consistency results in Tables 4.4.15.1 and 4.4.15.2 represent all cases where FO and RR are applicable to identify a direction, independently of whether the difference by which the direction is identified (by FO or RR) is significant or not (cf. Sections 4.3.5 and 4.3.6). Differences in the consistency results between FO and RR71 where significance levels are set are commented on in Section 5.3.6 (cf. Tables 5.3.6.1 and 5.3.6.6).

4.5 SUMMARY

Chapter 4 presents the key findings regarding the relevance of the criteria for directionality in a sample of present-day English noun/verb conversion pairs.

First, Section 4.2 describes the distribution of senses into orders of derivation and presents the resulting picture of such sense organization, i.e. the number of senses identified by orders of derivation.

Section 4.3 focuses on the results of the applicability of the criteria for directionality in a sample of 226 noun/verb conversion-related pairs in the first order of derivation, as follows:

i. Section 4.3.1 focuses on the applicability of the criterion of semantic dependence (SD),
ii. Section 4.3.2 on semantic pattern (SP),

iii. Section 4.3.4 on semantic range (SR),
iv. Section 4.3.3 on restrictions of usage (RU),
v. Section 4.3.5 on the applicability of the criterion of range of registers (RR) by way of two register classifications, and
vi. Section 4.3.6 on frequency of occurrence (FO).

Section 4.4 presents the results of the consistency between the direction indicated across the criteria tested in this thesis by senses, (for the criteria of SR, FO and RR, independently of the degree of confidence by which the criteria identify a direction). The cross-consistency results are presented as follows:

i. Section 4.4.1 focuses on the consistency between SD and SP,
ii. Section 4.4.2 on the consistency between SD and SR,
iii. Section 4.4.3 on the consistency between SD and RU,
iv. Section 4.4.4 on the consistency between SD and FO,
v. Section 4.4.5 on the consistency between SD and RR,
vi. Section 4.4.6 on the consistency between SP and SR,
vii. Section 4.4.7 on the consistency between SP and RU,
viii. Section 4.4.8 on the consistency between SP and FO,
ix. Section 4.4.9 on the consistency between SP and RR,
x. Section 4.4.10 on the consistency between SR and RU,
xi. Section 4.4.11 on the consistency between SR and FO,
xii. Section 4.4.12 on the consistency between SR and RR,
xiii. Section 4.4.13 on the consistency between RU and FO,
xiv. Section 4.4.14 is on the consistency between RU and RR, and
xv. Section 4.4.15 is on the consistency between FO and RR.

CHAPTER 5

DISCUSSION

5.1 INTRODUCTION

Chapter 5 discusses the key findings on the relevance of the criteria for directionality in a sample of present-day English noun/verb conversions, namely, SD, SP, SR, RU, FO and RR. Chapter 5 is organized as follows:

i. Section 5.2 starts with some general remarks on methodological issues, on the senses' distribution into orders of derivation, and the overall applicability of the criteria,
ii. Section 5.3 discusses the results of the consistency between the directions indicated by the criteria, and
iii. Section 5.4 discusses the criteria at a more general level, and the theoretical implications of the results of this thesis.

5.2 GENERAL REMARKS

5.2.1 Methodological remarks

It may be argued that the results of the criteria for directionality may differ if different corpora are used. True as this may be, largely as a result of the influence of the type and quality of any data source, only changes for a minor number of pairs concerning, e.g. FO or RR, or even the SR covered may be expected. This is especially relevant for pairs identified as restricted in use, e.g. dialectal, slang, specialized, etc. No significant changes are expected for widely used pairs.

Similarly, the choice of the dictionary may influence the analysis. In this thesis, the OED was selected as it captures a wide variety of meanings. Use of other resources to analyse senses may affect the outcomes. Still, the combination of both dictionary and corpus data in this thesis is intended to assist a more comprehensive analysis of the lexemes' senses.

The bias that the above might cause is similar to differences in sample selection or analysis approach, e.g. in that:

i. If all concordances of the pairs are considered, as in this thesis, less common or specialized senses can be identified too. Use of a threshold allows for a more manageable analysis, but it potentially omits senses used less frequently. In this thesis, many senses with low frequency of occurrence were found. Thus, the inclusion of all senses in use is considered relevant for directionality synchronically (even if extended senses which may not be key for directionality are included too). Admittedly, the method used in this regard has limitations, because manual classification of the concordances into senses is time-consuming, and this is partly why lexemes with a frequency higher than 1,000 were not included in our sample too.
ii. Differences may be found between an analysis at the level of lexeme, i.e. by considering core senses, and at the level of sense. Further variation may be expected in higher frequency words, such that they might exhibit a wider range of polysemy. In this thesis, pairs for which both lexemes present only one sense, as well as polysemous lexemes are represented. Still, as the sample is, by definition, limited, it is not expected to be representative of all the patterns that are possible in conversion.
iii. Differences may be found between an analysis of senses in use and an analysis of all senses, in use or not. Because this thesis focuses on directionality synchronically (cf. Section 2.4.3.2), lexical history, or obsolete senses (i.e. senses not attested in the BNC) are discarded. If these were included, the analysis of directionality would differ for some pairs as regards, e.g. the criteria of SD, SP, or SR or, even more generally, the sense distribution into orders of derivation.

Regarding point ii. above, a key aspect of this thesis is that directionality is researched at the level of sense. Previous research has focused on directionality in conversion at the level of the lexeme (cf. Balteiro 2007 to some extent; Bram 2011; Kisselew et al. 2016, among others). This thesis

aims to test if the semantic and quantitative-distributional criteria prove applicable when applied by senses, and to what extent they do, if at all.

The standpoint is that the results differ according to whether lexemes are analysed as a whole or by senses (cf. Section 5.4). This methodological difference is apparent in that, whereas a lexeme analysis (i.e. with focus on core senses) leads towards an analysis of conversion in terms of unidirectionality, a sense analysis allows:

i. for the identification of multiple directions for the same pair of paronymous lexemes (which may also be due to the influence of other lexemes), and, specifically,
ii. for the identification of recursive derivation in conversion.

Regarding point iii. above, it has been found that a diachronic and a synchronic approach to directionality in conversion often lead to contradictory results (Section 2.4.3.2, and references therein). This is because the interest lies in different issues: the former looks at the origin of words in a language, while the latter focuses on sense relations in present-day English. Thus, inconsistencies between, e.g. historical criteria (etymological information or attestation dates) and semantic or distributional criteria (the criteria tested in this thesis) are expected to differ regarding the direction(s) they identify for lexeme pairs. The low consistency found in previous research on directionality between some of the criteria may partly reflect this, together with the issues that the criteria and their application may present too. It is argued here that some of the criteria cannot be compared, because they look at different aspects of language, e.g. it does not make sense to compare FO and AD (dates of first attestation), unless a historical corpus with information of the use of senses over time is used. And even then, the analysis would not be free from the constraints associated with the use of dictionaries.

Partly also concerning differences in the approach taken, it was mentioned that directionality may change over time (cf. Section 2.5.7).[54] What is meant by this claim is that the first order of derivation direction identified for a pair may change, e.g. because the original sense in one of the pairs may disappear (i.e. it is no longer in use). Note that this applies only within a synchronic approach to directionality, and especially one which considers senses.

[54] This is in relation to Umbreit's (2010: 309) claim that frequency of occurrence can change over time as the semantic range of base and derived terms may change.

While senses in the first order of derivation may no longer be in use, and, thus, may not affect the analysis of directionality, this issue is not exclusive to the senses in the first order of derivation. Sometimes, gaps are found in recursive sense derivation too, which increases the complexity of the directionality analysis in polysemous pairs. This may be for two reasons:

i. senses, base or derived may become obsolete, but the senses directly related in the counterpart lexeme may still be used, or
ii. the specific sense may not be represented in the corpus employed. If this were the case, and because the corpus used in this thesis contains about a 100 million words, the misrepresentation of a sense is most probably linked to the sense being in restricted use.

Examples (93) and (94) are senses identified for the verb *prick*^{V} and marked as derivative senses based on their semantics (SD or SP), but for which no related senses were attested in the BNC, even though they are represented in the OED (senses (95) and (96), respectively).

(93) *prick*^{V} (one occurrence in the BNC)
sense 5b "†b. intransitive. Archery. To shoot at a mark or prick (prick n. 19); (figurative) to aim at. Obsolete." (OED), e.g. "*Prussian muskets* **pricked** *fame from the wood's edge, but the shooting was at too long a range and only one French horse tumbled into the wheat.*" (BNC)

(94) *prick*^{V} (one occurrence in the BNC)
sense 20 "a. transitive. To write or set down (music) by means of pricks or notes; (also) †to write music in (a book) (obsolete). Also intransitive: to write or mark out musical notation. Now chiefly historical." (OED), e.g. "*[…] lyrics rendered on the wild side in a predictably debauched drawl; sparse, uneasy music pricked by the ghosts of previous drug mythologists Lou Reed, Nick Cave, Nico and The Jesus And Mary Chain […]*" (BNC)

(95) *prick*^{N} (sense not identified in the BNC)
sense 19 "VI. In archery. 19. a. A mark aimed at when shooting an arrow, esp. the centre of the target or the area immediately around the pin (pin n.1 2b); the bullseye; (hence) a target, esp. one at a fixed distance, having such a central mark. Now rare. Contrasted in the latter sense with butt n.7 2 and rover n.2 1a. / †b. twelve (also twenty-four) score prick: a target with a mark in the centre placed 240 (or

480) paces distant, the regular distance at which shooting at the prick was practised. Obsolete." (OED)

(96) *prick*^{N} (sense not identified in the BNC)
sense 3b "b. A mark or dot used in musical notation; (a) (in medieval music) a note; (b) (in later musical notation) a dot placed after a note or rest for various purposes. Obsolete. Cf. prick v. 20a." (OED)

The presumption is that these may be examples of ii. above because the senses:

i. seem to be very specific or in restricted use, most marked as obsolete or rare too, and
ii. present a low frequency of occurrence in the corpus, as only one instance for each sense was identified after concordance classification into the OED senses.

5.2.2 Sense distribution into orders of derivation

This thesis is an analysis of the applicability of the criteria described in the literature for the identification of directionality in conversion at the sense level, arranged by orders of derivation. Precisely the latter point imposes the need for a presumed direction, but such a direction is only a methodological requirement that is subject to the results found over data analysis.

The identification of directionality based on semantic analysis can be biased, but subjective interpretations are prevented as far as possible in that the semantic analysis carried out in this thesis is based mainly on OED data, assisted by the usage that the lexemes take in context according to BNC concordances, whenever usage data is not available from the OED.

A key point of this analysis is that, even though the presumed derivational direction suggested between senses may not always be correct, the criteria used to assess directionality are then scrutinized and may prime the opposite derivational direction. Thus, the analysis is not inherently compromised by sense distribution into orders of derivations; if anything, sense distribution would identify the percentage of data for which the criteria and sense organization based on semantics align.

While sense classification into orders of derivation may admittedly introduce bias because semantic criteria are primed, especially the criteria of SD and SP, sense distribution into derivational paradigms is deemed best to test directionality criteria at the level of sense for several reasons:

i. the identification of directionality without any sense organization, e.g. by counting the number of total senses that follow a criterion per pair member would lead to unreliable results,
ii. the approach used here accounts for polysemy, which is often a major difficulty in the identification of directionality,
iii. sense organization into derivational orders allows for the representation of subsequent derivation between the senses of the pair members, e.g. *clamp*^{N} (INSTRUMENT) → *clamp*^{V} (INSTRUMENT) → *clamp*^{N} (RESULT). Subsequent derivation is observed for 46 pairs in our sample (20%), for which a total of 66 pairs of senses were identified in the second order of derivation,
iv. this approach allows a more detailed analysis of senses and avoids issues from including extended or figurative senses whenever they do not show SD or SP to senses in the counterpart lexeme (because figurative senses typically arise within the same lexeme, even if similar senses may be found in the pair member too), and
v. this approach allows for easier identification of pairs of senses by order of derivation.

Regarding point iv. above, and as has been described throughout, extended or figurative senses are sometimes identified and classified as extended within lexemes, and others in connection with senses in the other pair. A direction was analysed only in the latter case. This is in line with Valera's (2017) paper where he shows how sometimes figurative mechanisms give rise to conversion directly, while in others "[…] figurative extension by itself does not have any effect as far as conversion is concerned" (Valera 2017: 6–7).

For a discussion of the implications of sense distribution in this thesis, cf. Section 5.4.6.

5.2.3 On the individual applicability of the criteria

The applicability of the results of the criteria of SD, SP and RU for directionality by sense in the first order of derivation presented in Section 4.3 is here summarized as Table 5.2.3.1:

Table 5.2.3.1. Applicability of the semantic criteria

Criterion	Not applicable		Applicable	
	Unclear		SD indicates a direction (N>V or V>N)	
	nPairs of senses	%	nPairs of senses	%
SD	83	20.8%	316	79.2%
SP	76	19.05%	323	80.95%
RU	309	77.44%	90	22.56%

This shows, for a start, that the extent to which the criteria can be applied by sense is rather dissimilar, especially if SD or SP are compared with RU. Also, SR is not even displayed above, because the direction based on the semantic range covered was established considering all senses in use for the lexemes. Table 5.2.3.2 puts together the directionality results of the semantic criteria for the pairs of lexemes after a sense analysis, again showing the dissimilar degree of applicability of each criterion.

Table 5.2.3.2. Directionality of the semantic criteria for the pairs based on a sense analysis

Criterion	Not applicable (Unclear)		Applicable						Total Applicable	
			Noun-to-Verb (N>V)		Verb-to-Noun (V>N)		Two groups (N>V/V>N)			
	nPairs	%	nPairs	%	nPairs	%	nPairs	%	nPairs	%
SD	33	14.6%	125	55.31%	67	29.65%	1	0.44%	193	85.4%
SP	35	15.49%	121	53.54%	69	30.53%	1	0.44%	191	84.51%
SR (N)	79	34.96%	84	37.17%	63	27.87%			147	65.04%
SR (Y)	114	50.44%	67	29.65%	45	19.91%			112	49.56%
RU	157	69.47%	34	15.04%	35	15.49%			69	30.53%

These tables thus show that the criterion of SD is applicable for 79.2% of the pairs of senses identified in first order of derivation in this thesis (316 pairs out of the 399 pairs; cf. Table 5.2.3.1). In turn, this translates to the identification of directionality for 85.39% of the pairs of lexemes in the sample, after the organization of senses by orders of derivation (cf. Table 5.2.3.2), the number of pairs analysed as Noun-to-Verb being higher than those showing Verb-to-Noun.

The results for SP are very similar. Out of the 399 pairs of senses identified in first order of derivation, SP indicates a direction for 323 pairs (80.95%, cf. Table 5.2.3.1). A direction can be established by lexemes based on the related senses in first order of derivation for 84.51% of the pairs of lexemes in the sample, offering a very similar picture in the number of Noun-to-Verb and Verb-to-Noun pairs compared to SD (cf. Table 5.2.3.2).

Similar results were expected in the overall applicability of these two criteria because these typically go together, in that, when a sense shows semantic dependence towards another sense in the derivative, it is often defined using a semantic pattern typical of a derivative too, while the definitions of base senses are often more elaborate (cf. thus *bayonet*^{N} and *bayonet*^{V} below):

(97) *bayonet*^{N} (INSTRUMENT)
"2. a. A stabbing instrument of steel, which may be fixed to the muzzle of a musket or rifle; originally its handle was inserted in the mouth of the gun, but it is now secured by a circular band clasping the barrel […]" (OED)

(98) *bayonet*^{V} (INSTRUMENTAL)
"1. transitive. To stab or pierce with a bayonet." (OED)

Only for very few cases, just one of the other criteria was marked as showing a direction. When this is so, typically, the sense analysis was slightly more unclear, i.e. marked as showing SD or SP with some doubt.

Regarding SR, Table 5.2.3.2 includes cases of questionable applicability in the results section (cf. Table 4.3.3.1) as applicable as SR (N), whereas only clear cases are included as SR (Y). Even if questionable cases are interpreted as indicating a direction, the criterion still has a lower applicability compared to SD or SP (65.04%). Also, if only cases where the SR of the pairs is more certain are considered relevant, the applicability of the criterion decreases (49.56%). Even when the criterion is used, its relevance is questionable as the derivative is not necessarily always the pair member with the lower SR (cf. Section 5.4.3). This is because pairs of lexemes may follow different paths of development. The relevance of SR is further commented on in Section 5.3, when the consistency of SR and the other criteria tested in this thesis is compared, and in Section 5.4.3 showing examples of the relevance of SR in directionality.

RU proves applicable for a small part of the data (90 pairs of senses out of the 399 pairs analysed in first order of derivation (22.56%, cf. Table 5.2.3.1), which translates to the identification of directionality for 69 pairs out of the 226 pairs of lexemes in our sample (30.53%) based on sense analysis in first order derivation (cf. Table 5.2.3.2). The low applicability of the criterion results from the fact that for most pairs of senses either both (n=76; 19.05%) or none of the senses (n=233; 58.4%) show RU (cf. Table 4.3.4.4). Thus, it can be concluded that RU only proves applicable for very specific cases, when applied at the level of sense too. This is in line with the results of a pilot study on the applicability of the criteria in affixation (cf. Section 3.3.4; Ruz & Cetnarowska 2023: 27), and with literature on the issue about its low applicability, even though with a focus on the applicability at the level of lexeme. Results of this criterion cannot be compared with results in previous research on directionality in conversion because, as far as we know, only Balteiro (2007) uses RU for directionality in English (note, however, that she interprets the criterion as FO is interpreted in this thesis).

Table 5.2.3.3 presents again the results of the applicability of the quantitative-distributional criteria for the pairs of senses analysed in the first order of derivation for convenience. Table 5.2.3.4 puts together the directionality results of the quantitative-distributional criteria for the pairs of lexemes after an analysis by sense. Only the results of RR based on the BNC's David Lee's Classification into 71 registers are given in these tables (referred to as *RR71*). This is because, as shown in Section 4.3.6.2 (cf. Tables 4.3.6.2.4–4.3.6.2.7), a more fine-grained classification identifies directionality in a higher number of pairs of senses, while it also identifies a higher percentage of pairs between which the difference in register usage is interpreted as significant based on Fisher's Exact Test.

Table 5.2.3.3. Applicability of the quantitative-distributional criteria

Criterion	**Unclear**				**Applicable (significant difference)**	
	Not applicable		**No significant difference**		**SD indicates a direction (N>V or V>N)**	
	nPairs of senses	**%**	**nPairs of senses**	**%**	**nPairs of senses**	**%**
FO	10	2.51%	90	22.56%	299	74.94%
RR71	34	8.52%	206	51.63%	159	39.85%

Finally, Table 5.2.3.3 shows that FO proves applicable for a higher number of pairs of senses (299; 74.94%), whereas the individual applicability of RR is lower. Specifically, RR is not applicable when the pairs of senses compared cover the same number of registers in 34 pairs of senses (8.52%), and the difference in the register usage between 206 pairs (51.63%) is questioned as a directionality indicator because it did not prove statistically significant. When the criteria are interpreted for the pairs of lexemes (Table 5.2.3.4), they seem to offer a similar picture, the applicability of FO being higher.

Table 5.2.3.4. Directionality of the quantitative-distributional criteria for the pairs based on a sense analysis

Criterion	Analysis	Direction	nPairs	%	Total	%
FO	Significant difference	Noun-to-Verb	115	50.9%	173	76.55%
		Verb-to-Noun	58	25.7%		
	Undecided (UND Y)	Noun-to-Verb	6	2.7%	10	4.42%
		Verb-to-Noun	4	1.7%		
	No significant difference	Noun-to-Verb	20	8.8%	38	16.81%
		Verb-to-Noun	18	8.0%		
	Unclear	Same Freq (N=V)	5	2.2%	5	2.21%
RR71	Significant difference	Noun-to-Verb	75	33.19%	113	50%
		Verb-to-Noun	38	16.81%		
	Undecided (UND Y)	Noun-to-Verb	1	0.44%	3	3.99%
		Verb-to-Noun	2	3.54%		
	No significant difference	Noun-to-Verb	50	22.12%	96	42.48%
		Verb-to-Noun	46	20.35%		
	Unclear	Same nReg (N=V)	14	6.19%	14	6.19%

If one were to assume that the direction signalled by the criteria is correct and, thus, that the criteria indicate the same direction (or at least for most cases), directionality should be established based on SD and SP. This is because these are the most applicable criteria, followed by FO, which proves also fairly applicable to decide a direction. A direction, however, cannot be established for a large part of the data based solely on the applicability levels of the criteria of SR, RU, and RR, and, thus, these should not be given priority. This is in line with Marchand's (1964) description of the criteria (note his claim that the criterion of SD is "[…] often sufficient in itself to solve the

question of directionality, while other criteria are more or less concomitant in character", 1964: 10, cf. Section 2.5.6. for similar claims by other authors too).

5.3 ON THE CROSS-CRITERIA CONSISTENCY

A comparison of results across criteria reveals different directions (cf. the results in Section 4.4). The consistency between the criteria and how it may vary depending on how strictly the criteria are interpreted is further discussed below by criterion, specifically:

i. Section 5.3.1 is on the cross-consistency between SD and the rest of criteria in this thesis,
ii. Section 5.3.2 is on the consistency with SP,
iii. Section 5.3.3 is on the consistency with RU,
iv. Section 5.3.4 is on the consistency with SR,
v. Section 5.3.5 is on the consistency with FO, and
vi. Section 5.3.5 is on the consistency with RR.

Note that, in the discussion below, the following table header rows are used for the tables in this section:

i. *unclear direction* is used when none of the criteria show a direction,
ii. c*onsistent direction* is used when two criteria indicate the same direction,
iii. *inconsistent direction* is used when they do not, including cases where one criterion indicates a direction while the other does not, and
iv. *opposite direction* is used where both criteria are applicable and indicate a different direction.

5.3.1 Semantic Dependence (SD)

Section 5.3.1 discusses the results of the consistency of the direction across criteria, specifically SD vs the rest of criteria under study. Table 5.3.1[55] shows the consistency levels between SD and SP, RU, SR, FO, and RR for the 226 pairs according to an analysis by sense in the first order of derivation:

[55] In the tables in Section 5.3, results for (Y) cases are presented separately, showing only the numbers and percentages for pairs with a consistent direction. While a separate line includes all pairs (N), cases indicated as showing direction without certainty are omitted when focusing on (Y) results, partly because it would not be accurate to include them as "Inconsistent direction" or as "Unclear direction".

Table 5.3.1. Consistency between SD and other criteria by senses. *(Y)* and *(N)* stand for senses for which SR, FO, and RR signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*) or the difference in frequency or register usage is not significant, marked as *(FO(N)* or *RR71(N)*

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
SD/SP	188	83.19%	6	2.65%	32	14.16%
SD/SR(N)	103	45.58%	112	49.56%	11	4.87%
SD/SR(Y)	85	37.61%				
SD/RU	48	21.24%	153	67.7%	25	11.06%
SD/FO(N)	147	65.04%	78	34.51%	1	0.44%
SD/FO(Y)	129	57.08%				
SD/RR 71(N)	135	59.73%	88	38.94%	3	1.33%
SD/RR 71(Y)	85	37.61%				

In Table 5.3.1, SD presents a higher consistency with SP (83.19%), i.e. both indicate the same direction for the largest number of pairs. After SP, SD presents higher consistency with FO to 57.08% (Y), and with RR and SR (37.61%), even if the consistency decreases. SD presents the lowest consistency levels with regard to RU. This can be regarded as a result of the low applicability of the criteria of RU, which is applicable only for 90 pairs of senses in the first order of derivation (cf. Table 4.3.4.4).

Table 5.3.1 also shows that the results in terms of the consistency levels across criteria vary according to how strictly the criteria are interpreted. This is specifically so for the criteria of SR, FO, or Reg as follows:

i. The three criteria prove applicable in a larger number of cases, if the criteria are interpreted strictly, e.g. if every instance where a sense shows a higher frequency of occurrence than its related pair is interpreted as showing a direction between senses, regardless of how large or small the difference is. Thus, if the results are considered (represented as (N) in Table 5.3.4.1), the consistency levels between criteria are higher too.
ii. The criteria prove applicable in a lower number of cases if significance levels are established, e.g. if only cases where a significant difference is found between the senses frequency of occurrence are considered (represented as (Y) in Table 5.3.4.1. Thus, consistency levels between these and other criteria prove lower too.

Differences are identified in this thesis between the two analyses. The more restrictive method is followed, and significance levels are established. This is because interpreting a direction is questioned where:

i. the pairs cover a fairly similar semantic range (cf. Section 4.3.3),
ii. the frequency of occurrence between senses is either too low for both senses or is close (cf. Section 4.3.5), and
iii. the range of registers covered between senses is either too low for both senses or is close (cf. Section 4.3.6).[56]

The consistency levels where both SD and SR are applicable are further commented on in Section 5.3.4 (cf. Table 5.3.4.2). Similarly, Section 5.3.5 comments further on the consistency levels where both SD and FO are applicable (cf. Table 5.3.5.2), and Section 5.3.6 where both SD and RR71 are applicable (cf. Table 5.3.6.2).

5.3.2 Semantic Pattern (SP)

Section 5.3.2 discusses the results of the consistency of the direction across criteria, specifically SP vs the rest of criteria under study. Table 5.3.2 shows the consistency levels between SP and SD, RU, SR, FO, and RR for the 226 pairs according to an analysis by sense in the first order of derivation.

It can be observed that Tables 5.3.1 and 5.3.2 show very similar results for the criterion of SD and SP. This is because these two criteria often indicate the same direction for the same pairs of senses (cf. Section 5.3.1). Specifically, SP presents a higher consistency with SD (83.19%), followed by consistency with FO (55.75% when significance is considered (Y)). The consistency with SR (37.17%) and RR (36.73%) is low. SP presents the lowest consistency level with RU (20.35%).

[56] Regarding RR the applicability of a statistical test to prove differences in register usage is questioned (cf. Sections 4.3.6 and 5.3.6).

Table 5.3.2. Consistency between SP and other criteria by senses. (Y) and (N) stand for senses for which SR, FO, and RR signal a direction, even if the difference in the semantic range covered is close to similar (shown as SR(N)) or the difference in frequency or register usage is not significant, marked as (FO(N) or RR71(N)

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
SP/SD	188	83.19%	6	2.65%	32	14.16%
SP/SR(N)	102	45.13%	112	49.56%	12	5.31%
SP/SR(Y)	84	37.17%				
SP/RU	45	19.91%	157	69.47%	24	10.62%
SP/FO(N)	145	64.16%	80	35.4%	1	0.44%
SP/FO(Y)	126	55.75%				
SP/RR 71(N)	133	58.85%	91	40.27%	2	0.88%
SP/RR 71(Y)	83	36.73%				

Overall, the consistency between the results of the criteria of SP (or SD) and SR, RR and RU is low because:

i. SR has a lower applicability in the sample than other criteria. Thus, an inconsistent direction is found for a higher number of pairs, especially if a direction is interpreted only when there is a difference in the semantic range covered by the lexemes (cf. the results in Section 4.3.3),
ii. RU proves applicable only for 90 pairs of senses in the first order of derivation (cf. the results in Table 4.3.4.4), thus, an inconsistent direction is found for a higher number of pairs too, or
iii. the difference between the range of registers (*RR71*) covered by pairs of senses is interpreted as significant only for 39.85% of the pairs of senses according to Fisher's Exact Test (cf. Section 4.3.6; Table 4.3.6.5). Thus, an inconsistent direction is found for a higher number of pairs when significance levels are established.

For a large part of the data, the inconsistent results are thus cases in which one of the criteria (SP or SD) indicates a direction, but the analysis of RU, SR, or RR does not. The consistency levels where both SP and SR are applicable are further commented on in Section 5.3.3 (cf. Table 5.3.3.3). Section 5.3.5 comments further on the consistency levels where both SP and FO are applicable (cf. Table 5.3.5.3), and Section 5.3.6 where both SP and RR71 are applicable (cf. Table 5.3.6.3).

5.3.3 Semantic Range (SR)

Section 5.3.3 discusses the results of the consistency of the direction across criteria, specifically SR vs the rest of criteria under study. Table 5.3.3.1 shows the consistency levels between SR and SD, SP, RU, FO, and RR for the 226 pairs according to an analysis by sense in the first order of derivation. The table shows results according to two interpretations of SR, FO, and RR:

i. *SR(N)* includes cases for which a direction is identified according to SR but is questionable, i.e. cases for which the SR between pairs was marked as close to similar (the semantic range covered by one of the pairs being slightly wider), or
ii. *SR(Y)* counts only cases for which the SR was identified as wider (marked >) for one of the pairs.
iii. Similarly, *FO(N)* and *RR(N)* include all cases where a direction can be identified, i.e. cases where the frequency of occurrence or the range of registers covered by one of the pair senses is higher than its counterpart's, and
iv. *FO(Y)* and *RR(Y)* count only cases for which the differences were interpreted as significant after application of two statistical tests.

Table 5.3.3.1 Consistency between SR and other criteria by senses. *(Y)* and *(N)* stand for senses for which SR, FO and RR signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*) or the difference in frequency or register usage is not significant, marked as *(FO(N)* or *RR71(N)*

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
SR(N)/SD	103	45.58%	112	49.56%	11	4.87%
SR(Y)/SD	85	37.61%				
SR(N)/SP	102	45.13%	112	49.56%	12	5.31%
SR(Y)/SP	84	37.17%				
SR(N)/RU	35	15.49%	134	59.29%	57	25.22%
SR(Y)/RU	31	13.72%				
SR(N)/FO(N)	109	48.23%	116	51.33%	1	0.44%
SR(Y)/FO(Y)	78	34.51%				
SR(N)/RR71(N)	101	44.69%	117	51.77%	8	3.54%
SR(Y)/RR71(Y)	50	22.12%				

Overall, the table shows that the results for the consistency levels between SR and any of the criteria are always below 50%. Consistency levels vary according to whether the criterion of SR is interpreted in an inclusive (N) or in a restrictive way (Y). Table 5.3.3.2[57] shows results for the consistency and inconsistency levels between SR and SD (whenever both are applicable), and Table 5.3.3.3 shows results for the comparison between SR and SP. For the consistency levels where both SR and RU are applicable see Section 5.3.4. (cf. Table 5.3.4.4), for consistency levels where both SR and FO are applicable see Section 5.3.5 (cf. Table 5.3.5.4), and for consistency levels where both SR and RR71 are applicable see Section 5.3.6 (cf. Table 5.3.6.4).

Table 5.3.3.2. Consistency of cases where both SR and SD signal a direction, with specification of whether the difference in SR is clear or not. *(Y)* and *(N)* stand for senses for which SR signals a direction, even if the difference in the semantic range covered is close to similar (shown as *(N)*)

SR vs SD	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
SR (Y)	85	37.61%	13	5.75%
SR (N)	18	7.96%	7	3.1%

Table 5.3.3.3. Consistency of cases where both SR and SP signal a direction, considering whether the difference in SR is clear or not. *(Y)* and *(N)* stand for senses for which SR signals a direction, even if the difference in the semantic range covered is close to similar (shown as *(N)*)

SR vs SP	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
SR (Y)	84	37.17%	14	6.19%
SR (N)	18	7.96%	6	2.65%

Whenever the directionality established by an analysis of SR by senses is unclear, the data are disregarded and, as a result, the consistency between SR and the other criteria (SD, SP) decreases. Notably, the comparison of cases

[57] Note that in this and the following tables of Section 5.3 (i.e. cases where two criteria are applicable) the percentages do not amount to 100%. This is because the number of pairs where either one or both criteria are not applicable (i.e. do not indicate a direction) is not specified.

for which the criteria indicate opposite directions is not as expected: Whereas SR may be expected to disagree with other criteria, especially when the semantic range covered by the senses of the lexemes is considered close to similar (N), the results show that, for the three criteria compared in Tables 5.3.3.2 and 5.3.3.3, a higher number of cases evidence:

i. that inconsistent direction obtains, and
ii. SR differs between pairs (Y) in that one presents a wider semantic range than the other.

This casts serious doubts on the applicability of the criterion of SR.

5.3.4 Restrictions of Usage (RU)

Section 5.3.4 discusses the results of the consistency of the direction across criteria, specifically RU vs the rest of the criteria under study. Table 5.3.4.1 shows the consistency levels for the 226 pairs in this sample based on an analysis by sense in the first order of derivation:

Table 5.3.4.1 Consistency between RU and other criteria by sense. *(Y)* and *(N)* stand for senses for which SR signals a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*). The significance of the difference in FO or RR71 is not represented

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
RU/SD	48	21.24%	153	67.7%	25	11.06%
RU/SP	45	19.91%	157	69.47%	24	10.62%
RU/SR(N)	35	15.49%	134	59.29%	57	25.22%
RU/SR(Y)	31	13.72%				
RU/FO(N)	51	22.57%	171	75.66%	4	1.77%
RU/FO(Y)	47	20.79%				
RU/RR71(N)	50	22.12%	165	73.01%	29	12.83%
RU/RR71(Y)	32	15.04%				

Table 5.3.4.1 shows that consistency levels with the criterion of RU are always lower than 25%. This is because of the low applicability of the criterion itself, as discussed in Section 5.3. Table 5.3.4.2 shows specific

results for the consistency levels between RU and SD (whenever both are applicable), Table 5.3.4.3 shows results for the comparison between RU and SP, and Table 5.3.4.4 shows results for the comparison between RU and SR.

Table 5.3.4.2. Consistency of cases where both RU and SD signal a direction

RU vs SD	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
	48	21.24%	13	5.75%

Table 5.3.4.3. Consistency of cases where both RU and SP signal a direction

RU vs SP	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
	45	19.91%	12	5.31%

Table 5.3.4.4. Consistency of cases where RU and SR signal a direction. *(Y)* and *(N)* stand for senses for which SR signals a direction, even if the difference in the semantic range covered is close to similar (shown as *(N)*)

RU vs SR	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
SR (Y)	31	13.72%	10	4.42%
SR (N)	4	1.77%	2	0.88%

A look at the consistency levels across criteria, wherever both criteria give a direction, highlights once again the low applicability of a unified analysis. If one goes back to the results of Table 4.4.3 (for the consistency between SD and RU) and Table 4.4.7 (for the consistency between SP and RU), the largest percentage of pairs listed as indicating an "inconsistent direction" stands out in pairs for which the criterion of SD or SP indicate a direction but for which RU is unclear (SD/RU (unclear): 57.96%; SP/RU (unclear): 58.41%). Thus, the low consistency across criteria in this case results from the low applicability of the criterion of RU.

Also, if one goes back to Table 5.3.4.1, it may at first be argued that RU is more in line with distributional criteria, based on (N) results given in the table. This is because they show a higher percentage of agreement as regards the direction identified. However, disagreement levels are also higher,

so it can be presumed that this is an effect of the overall applicability of the criteria, i.e. it may be because, as FO identifies a direction more often than other criteria, the percentage of agreement or disagreement may be higher too.

It is here argued that the higher agreement levels identified with FO or RR also depend on the method used to interpret them. In an inclusive analysis of FO, i.e. the sense that is less frequently used is interpreted as the derivative, regardless of frequency differences (N), the criterion will naturally prove applicable for a higher number of cases. However, this thesis argues that, for frequency to be indicative of a direction, the difference between the pairs should be significant (Y). Thus, FO is here interpreted to be unable to identify a direction for pairs whose frequencies are the same (10 pairs of senses, 2.51%, cf. Table 4.3.5.4) or for those pairs of senses whose frequency of occurrence in a corpus is too close (90 pairs of senses, 22.56%, cf. Table 4.3.5.4). For the consistency levels where both RU and FO are applicable see Section 5.3.5 (cf. Table 5.3.5.5), and, for consistency levels where both RU and RR71 are applicable, see Section 5.3.6 (cf. Table 5.3.6.5).

5.3.5 Frequency of occurrence (FO)

Section 5.3.5 discusses the results of the consistency of the direction across criteria, specifically FO vs the rest of criteria under study. Table 5.3.5.1 shows the consistency levels between FO and SD, SP, RU, SR, and RR for the 226 pairs according to an analysis by sense in the first order of derivation.

Table 5.3.5.1 shows the results according to two interpretations of FO, but also of SR and RR:

i. (N) includes cases for which a direction is identified according to the criteria but is questionable, i.e. cases for which the semantic range covered by one of the pairs is slightly wider, or where the difference in the frequency of occurrence of the senses or the range of registers that they cover in the BNC is not significant, and
ii. (Y) counts the cases described in (i.) as *unclear*.

Table 5.3.5.1 Consistency between FO and other criteria by sense. *(Y)* and *(N)* stand for senses for which SR, FO, and RR signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*) or the difference in frequency or register usage is not significant (*FO(N)* or *RR71(N)*)

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
FO(N)/SD	147	65.04%	78	34.51%	1	0.44%
FO(Y)/SD	129	57.08%				
FO(N)/SP	145	64.16%	80	35.4%	29	12.83%
FO(Y)/SP	126	55.75%				
FO(N)/SR(N)	109	48.23%	116	51.33%	1	0.44%
FO(Y)/SR(Y)	78	37.17%				
FO(N)/RU	51	22.57%	171	75.66%	4	1.77%
FO(Y)/RU	47	20.8%				
FO(N)/RR71(N)	195	86.28%	28	12.83%	3	1.33%
FO(Y)/RR71(Y)	107	47.35%				

As in previous sections, the results for the consistency levels across criteria vary according to how restrictive the analysis of the criteria is. This is because a lower consistency across criteria is found when the analysis of the criteria is restrictive (Y) vs inclusive (N). Overall, according to the restrictive analysis, FO seems to present higher consistency with SD, followed by SP. The results of the consistency between FO and SD are shown in Table 5.3.5.2, to account for cases where both criteria prove applicable. Similarly, Table 5.3.5.3 shows cases where both FO and SP are applicable.

Table 5.3.5.2. Consistency between FO and SD where both are applicable. *(Y)* and *(N)* stand for senses for which FO signals a direction, even if the difference is statistically not significant (shown as *(N)*)

FO vs SD	Consistent direction		Inconsistent direction	
	nPairs	%	nPairs	%
FO (Y)	123	54.42%	28	12.39%
FO (N)	19	8.41%	7	3.10%
FO (UND Y)	6	2.65%	4	1.77%
FO (UND N)	1	0.44%	2	0.88%

FO and SD are consistent for 129 pairs (57.08%) if *UND Y* and *Y* are counted together. Contrary to expectations, a quite large number of pairs where the criteria indicate opposite directions are cases where the difference in the senses' frequency of occurrence is statistically significant, specifically, 32 pairs (14.16%) (*Y* and *UND Y*). It could be expected that, if opposite directions were identified by the criteria, these would be cases where the difference in the frequency of occurrence is not statistically significant and, thus, a direction cannot be claimed with confidence based on FO. The results show that this is not the case, and this casts doubts on the applicability of the criteria.

Table 5.3.5.3. Consistency between FO and SP where both are applicable. *(Y)* and *(N)* stand for senses for which FO signals a direction, even if the difference is not statistically significant (shown as *(N)*)

FO vs SP	**Consistent direction**		**Inconsistent direction**	
	nPairs	**%**	**nPairs**	**%**
FO (Y)	120	53.10%	28	12.39%
FO (N)	19	8.41%	8	3.54%
FO (UND Y)	6	2.65%	4	1.77%
FO (UND N)	1	0.44%	2	0.88%

Similarly, Table 5.3.5.3 shows that FO and SP are consistent for 129 pairs (57.08%) where the difference in the pair's frequency is statistically significant (UND Y) and (Y). However, a quite large number of pairs where the criteria indicate opposite directions is for cases where FO is established with confidence too. Specifically, 32 pairs (14.16%) are cases where FO is marked as *(Y)* or *(UND Y)*.

Table 5.3.5.4 refines the consistency across the criteria of SR and FO (where both are applicable), with the specification of significance levels or questionable cases.

When SR and FO are compared, the picture varies according to whether:

i. significance levels are considered in FO (Y), or
ii. cases for which the difference in the semantic range is interpreted as too close to identify a direction are included (N) or not (Y).

Table 5.3.5.4. Consistency between SR and FO where SR is applicable. *(Y)* and *(N)* stand for senses for which SR and FO signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*), or the difference in frequency or register usage is not significant (*FO(N)*)

FO vs SR	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
FO(Y)/SR(Y)	78	34.51%	20	8.85%
FO(Y)/SR(N)	19	8.41%	7	3.10%
FO(N)/SR(Y)	7	3.10%	6	2.65%
FO(N)/SR(N)	5	2.21%	1	0.44%

Specifically, Table 5.3.5.4 shows that the consistency across criteria when these restrictions are considered (Y) decreases: Only 34.51% of the pairs show consistency across SR and FO, where the analysis of the two is significant or certain (Y). Also, it was shown that most cases where the criteria indicate opposite directions are pairs where both SR and FO signal a direction with a higher degree of certainty too (Y) (8.85%). Again, this casts doubt on the applicability of the criteria.

Table 5.3.5.5 refines the consistency across the criteria of FO and RU (where both are applicable), with specification of significance levels for FO.

Table 5.3.5.5. Comparison of cases where RU and FO signal a direction, considering the level of significance of FO. *(Y)* stands for senses for which the frequency difference is interpreted as statistically significant, *(N)* stands for senses for which the frequency difference is not statistically significant, *(UND Y)* stands for senses for which FO signals two directions and frequency differences are statistically significant

FO vs RU	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
FO (Y)	46	20.35%	10	4.42%
FO (UND Y)	1	0.44%	7	3.1%
FO (N)	4	1.77%	2	0.88%

Table 5.3.5.5. shows that when only cases where the frequency differences are significant based on a Chi-squared test are considered, the consistency of the criteria decreases: They agree for 46 pairs (20.35%). The table also shows

that, when RU and FO signal opposite directions, the difference in the frequency is significant (Y) for ten pairs (4.42%). For nine other pairs (3.98%), it is either not statistically significant (N) (0.88%) or the direction by FO is established based on the pair featuring the most frequent senses (UND Y) (3.1%).

Initially, it remains unclear which of the criteria signal the correct direction when the criteria give opposite results, and the accuracy of the direction indicated when they agree. The fact that they signal opposite directions shows that the criteria (one or both) do not prove applicable, at least for some cases. For the consistency levels across FO and RR where both are applicable, see Section 5.3.6 (cf. Table 5.3.6.6).

5.3.6 Range of registers (RR)

Section 5.3.6 discusses the results of the consistency of the direction across criteria, specifically RR vs the rest of criteria under study. Table 5.3.5.1 shows the consistency levels between RR71 and SD, SP, RU, SR, and FO for the 226 pairs according to a sense analysis in the first order of derivation:

Table 5.3.6.1 Consistency between RR71 and other criteria by sense. *(Y)* and *(N)* stand for senses for which SR, FO, and RR71 signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*) or the difference in frequency or register usage is not significant (*FO(N)* or *RR71(N)*)

Criteria	Consistent direction		Inconsistent direction		Unclear direction	
	nPairs	%	nPairs	%	nPairs	%
RR71(N)/SD	135	59.73%	88	38.94%	3	1.33%
RR71(Y)/SD	85	37.61%				
RR71(N)/SP	133	58.85%	91	40.27%	2	0.88%
RR71(Y)/SP	83	36.73%				
RR71(N)/SR(N)	101	44.69%	117	51.77%	8	3.54%
RR71(Y)/SR(Y)	50	22.12%				
RR71(N)/RU	50	22.12%	165	73.01%	29	12.83%
RR71(Y)/RU	34	15.04%				
RR71(N)/FO	194	85.84%	29	12.83%	3	1.33%
RR71(Y)/FO(Y)	107	47.35%				

Table 5.3.6.1 shows the results according to two interpretations of RR71, and of SR and FO too, as described in previous sections. Again, the table shows that the consistency levels across criteria vary according to whether the analysis of the criteria is inclusive (N) or restrictive (Y).

Overall, the restrictive analysis (Y), i.e. excluding cases of questionable applicability in SR or where the difference in register or frequency is not significant, shows that RR71 presents higher consistency with FO, followed by SD and SP. The higher consistency levels between FO and RR were expected because these criteria are based on the same corpus data and typically go together, i.e. a higher range of register coverage is expected for senses attested more frequently in the corpus. Note that the difference between the consistency levels by the two methods differ greatly for SR and the other criteria. This is a side effect of the low percentage of significant differences by senses identified by Fisher's Exact Test when analysing the applicability of RR. The results discussed in this section should be interpreted with caution.

The results of the consistency across RR71 and SD are presented in Table 5.3.6.2, showing cases where both criteria prove applicable. Similarly, Table 5.3.6.3 shows cases where both the criterion of RR71 and SP are applicable.

Table 5.3.6.2. Consistency between RR71 and SD where both are applicable. *(Y)* and *(N)* stand for senses for which FO signals a direction, even if the difference is not statistically significant (shown as *(N)*)

RR71 vs SD	**Consistent direction**		**Inconsistent direction**	
	nPairs	**%**	**nPairs**	**%**
RR71 (Y)	83	36.73%	17	7.52%
RR71 (UND Y)	2	0.88%	1	0.44%
RR71 (N)	49	21.68%	27	11.95%
RR71 (UND N)	2	0.88%	1	0.44%

Table 5.3.6.3. Consistency between FO and SP where both are applicable. *(Y)* and *(N)* stand for senses for which FO signals a direction, even if the difference is not statistically significant (shown as *(N)*)

RR71 vs SP	**Consistent direction**		**Inconsistent direction**	
	nPairs	**%**	**nPairs**	**%**
RR71 (Y)	81	35.84%	17	7.52%
RR71 (N)	48	21.24%	27	11.95%
RR71 (UND Y)	2	0.88%	1	0.44%
RR71 (UND N)	2	0.88%	1	0.44%

Table 5.3.6.2 shows that, where the difference in the range of registers covered by the pairs of senses is significant (*Y* and *UND Y*), the direction signaled by RR and SD is consistent for 85 pairs (37.61%). The table also shows that, whereas in most cases where an inconsistent direction is signalled by these two criteria, the difference in register usage is not statistically significant (28 pairs, 12.39%), still a quite large number (18 pairs, 7.96%) is for cases where the difference in register usage is significant, so RR71 was interpreted as showing directionality with confidence. This is the case even when significance was established only for 39.85% of the senses in our sample (cf. Table 4.3.6.2.5).

Similarly, Table 5.3.6.3 shows that RR71 and SP signal consistent directions for 83 pairs (36.73%) where the difference in the pairs' frequency difference is statistically significant (*UND Y* and *Y*). However, a quite large number of pairs where the criteria signal opposite directions are cases where RR71 is established with confidence too (18 pairs, 7.96%). These numbers cast serious doubts on the applicability of the criteria.

Next, Table 5.3.6.4 refines the consistency across the criteria of RR and SR with specification of significance levels or questionable cases.

Table 5.3.6.4. Consistency between SR and RR71. *(Y)* and *(N)* stand for senses for which SR and RR71 signal a direction, even if the difference in the semantic range covered is close to similar (shown as *SR(N)*) or the difference in frequency or register usage is not significant (*RR71(N)*)

RR71 vs SR	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
RR71(Y)/SR(Y)	50	22.12%	16	7.08%
RR71(Y)/SR(N)	8	3.54%	4	1.77%
RR71(N)/SR(Y)	29	12.83%	13	5.75%
RR71(N)/SR(N)	14	6.19%	6	2.65%

Table 5.3.6.4 shows that, if the data where the directionality by an analysis of SR by senses is questionable are left out, and, if the significance levels of RR are considered, the consistency across criteria decreases to 50 pairs (22.12%). Also, Table 5.3.3.7 shows that for 16 pairs where both SR and RR71 signal a direction with a higher degree of certainty too (Y) the criteria signal opposite directions (7.08%). For 17 other cases where the criteria signal opposite directions, only one or the other criterion signals a direction with certainty (7.52%). Again, the number of cases where the criteria signal opposite directions is quite significant and casts doubts on the applicability of the criteria for directionality in conversion. Table 5.3.6.5 presents the consistency across RR and RU where both are applicable.

Table 5.3.6.5. Comparison of cases where RU and RR71 signal a direction, considering the level of significance of RR. *(Y)* and *(N)* stand for senses for which SR and RR71 signal a direction, even if the difference in frequency or register usage is not significant (*RR71(N)*). *(UND Y)* and *(UND N)* stand for senses for which RR signals two directions and register usage differences are interpreted as statistically significant (Y) or not (N)

RR71 vs RU	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
RR71 (Y)	32	14.16%	4	1.77%
RR71 (UND Y)	2	0.88%	3	1.33%
RR71 (N)	16	7.08%	9	3.98%
RR71 (UND N)	–	–	1	0.44%

As Table 5.3.6.5 shows, the consistency across RR and RU is very low (15.04%). This is partly as a result of the lower applicability of the criteria:

i. in the case of RU because, as described in the results (cf. Section 4.3.4), restrictions of usage are often present either in both senses involved in conversion or in none of the senses. Thus, RU only proves applicable for a small number of senses, and
ii. in the case of RR, because a statistical test proves significant differences between a low number of pairs of senses. This is partly because the statistical test may not work well with a low number of registers (including up to 71 categories).

Also, the two criteria signal opposite directions for nine pairs (3.1%) where both are applicable (Y and UND Y), while in other ten pairs (4.42%), the RR difference is not significant and thus the direction is interpreted as uncertain (cf. Table 5.3.4.3).

From the comparison of RR and SD, SP, SR, or RU, the consistency results vary for all criteria to some extent, but the difference is more striking for the consistency between FO and RR.

Table 5.3.6.6 shows the consistency between FO and RR71 in more detail, i.e. with specification of undecided cases (UND Y). The label *UND Y* is used where a similar number of pairs of senses signal an opposite direction (and the difference is statistically significant). As described from the results in Tables 4.3.5.5 for FO and 4.3.6.9 for RR, in these cases a direction in first order was decided according to the analysis of the pair of senses with:

i. the higher frequency of occurrence, or
ii. covering a wider range of registers within the pair of lexemes.

Table 5.3.6.1 above shows that, within an inclusive method, the criteria indicate the same direction for 85.84% of the sample. Consistency was indeed expected to be higher between these two criteria as they are based on data on the senses' usage in the BNC and, the higher frequency a sense shows, the more likely it is to cover a wider range of registers. However, as shown in Table 5.3.6.6, after significance levels based on two statistical tests (a Chi-squared test for FO and Fisher's Exact test for RR) are established, the consistency across FO and RR is much lower (47.35%).

Table 5.3.6.6. Consistency between FO and RR71, where both are applicable. *(Y)* stands for differences in the frequency or register usage between pairs interpreted as significant; *(UND Y)* differs from the former in that it is used for pairs for which the directionality was decided based on the pair with the more frequent senses, or senses covering a larger number of registers in the BNC); *(N)* stands for differences between pairs of senses interpreted as not significant

RR71 vs FO	**Consistent direction**		**Opposite direction**	
	nPairs	**%**	**nPairs**	**%**
RR71(Y)/FO(Y)	103	45.58%	5	2.21%
RR71(Y)/FO(UND Y)	1	0.44%	3	1.33%
RR71(UND Y)/FO(Y)	1	0.44%	–	–
RR71(UND Y)/FO(UND Y)	2	0.88%	–	–
RR71(Y)/FO(N)	–	–	1	0.44%
RR71(N)/FO(Y)	60	26.55%	4	1.77%
RR71(N)/FO(UND Y)	2	0.88%	2	0.88%
FO(N)/RR71(N)	25	11.06%	2	0.88%
Total	194	85.84%	17	7.52%

Also, as shown in Table 5.3.6.6, most pairs where RR71 and FO indicate a consistent direction are pairs where both criteria are applicable (Y). However, a large part (62 pairs) are cases where they signal the same direction, except that only FO is validated statistically. These data cast doubts on the applicability of RR, and on the applicability of the statistical measure to establish significance levels used for RR, which may not be appropriate to measure differences between a low number of registers. RR results should thus be taken with caution. Also, as both RR and FO seem to give very similar results on the direction they signal, it may not make sense to use both analyses to establish directionality in conversion and, if only one of the tests were to be used (assuming that the results obtained are correct), the use of FO is given priority over RR, because significant frequency differences (Y) can be found between a larger number of pairs.

5.4 ISSUES AND RELEVANCE OF THE CRITERIA

Sections 5.2.3 and 5.3 discussed the results of the applicability and consistency across the criteria tested in this thesis. Further discussion on general aspects, exemplification of issues, and on the relevance of the criteria is provided in Section 5.4, as follows:

i. Section 5.4.1 focuses on the criterion of semantic dependence (SD),
ii. Section 5.4.2 on semantic pattern (SP),
iii. Section 5.4.3 on semantic range (SR),
iv. Section 5.4.4 on restrictions of usage (RU), and
v. Section 5.4.5 on distributional criteria, specifically, frequency of occurrence (FO) and range of registers (RR), both discussed together for the similar issues that they present.

Section 5.4.6 is on general implications of the sense organization in this thesis for research on directionality.

5.4.1 Semantic Dependence (SD)

Within Marchand's semantic criteria, SD is described as "[…] often sufficient in itself to solve the question of directionality, while other criteria are more or less concomitant in character" (1964: 10). As described in Chapter 2, similar claims are available elsewhere in the literature (cf. Section 2.5.6, and references therein). More importantly, when other criteria are given priority and appear to fail, SD is given priority to decide on directionality (e.g. Sanders 1988: 173–174 or Cetnarowska 1993: 32).

This is partly supported by the analysis of SD in this thesis, which seems to indicate a direction between senses for a large number of pairs (around 80%). Specifically, when senses in the first order of derivation are considered, SD seems to solve the direction for 193 pairs (85.4%, cf. Section 4.3.1). Still, the direction between some senses remains unclear (cf. the examples in 4.3.1), either because:

i. none of the pair of related senses shows SD strongly, or
ii. because the senses, to some extent, are analysed as showing SD towards the other (cf. also the discussion e.g. in Sanders 1988: 173–174).

It must be noted, however, that, not even in affixation, where directionality is initially not an issue, does this criterion prove valid for all cases (cf. Ruz & Cetnarowska 2023).

One of the issues of applicability of the criterion in noun/verb conversion in English is that a different degree of applicability (or a different degree of consistency of SD with AD) is reported in previous studies. This may be partly as a result of:

i. different samples of conversion being used,
ii. different resources used to test the criteria, and
iii. partly also because the criterion may be interpreted differently.

Regarding point iii., the interpretation of SD is not always described in previous studies in detail, and interpretations which are substantially different may be found in the literature. For instance, the criterion may be taken to strictly require the counterpart lexeme in the definition, e.g. as in Bram (2011) who claims that SD "[…] involves the inclusion or use of the base form in the core meaning or definition of the converted counterpart" (2011: 153), while another may consider it enough for a sense to be defined without using the counterpart term, e.g. when it is defined using synonyms which are also used to describe the counterpart lexeme. The latter is the case in this thesis: In the pilot study on affixation and the study of conversion, pairs were found where the terms are defined using synonyms, but still a SD analysis can be established between them, e.g. *dapple*$^{N/V}$:

(99) *dapple*^{N} (QUALITY)
sense 1 "One of many roundish spots or small blotches of colouring by which a surface is diversified." (OED), e.g. "*When they are patterned, their designs tend to be simple spots and* **dapples***. Bony fish, on the other hand, are strikingly different.*"

(100) *dapple*^{V} (ORNATIVE)
sense 1a "1. a. transitive. To mark or variegate with rounded spots or cloudy patches of different colour or shade. / b. figurative." (OED), e.g. "*[…] a large garden, which was protected from the heat by the umbrella of a huge and ancient vine, the shadow of whose leaves* **dappled** *the paved floor*."

It remains unclear whether the use of parallel definitions to decide on a direction in conversion is enough to establish SD, i.e. senses defined using a synonymous pairs related by affixation, or whether this may lead to an incorrect analysis in some cases. An instance of this is, e.g.:

(101) *piss*^{N} (SUBSTANCE (OR RESULT))
sense 1 "1. Urine, esp. evacuated urine." (OED), e.g. "*Some of the lights in the tunnel are busted, and it smells of* **piss**."

(102) *piss*^{V} (SUBSTANCE EMISSION (OR EFFECTIVE))
sense 1 "1. a. intransitive. To urinate." (OED), e.g. "*I* **pissed** *in a test-tube, had four injections and did twenty press-ups to get my heart going*."

In this thesis, only the pair shown immediately above where related senses are defined using only a synonymous pair by affixation was identified. The decision was to mark the direction by SD as unclear for this pair of senses, although one could rather feel inclined to decide on a Noun-to-Verb direction based on a parallelism with *urine*^{N} and *urinate*^{V}. Note that the decision to analyse the relation between these senses as *unclear* influences the analysis of the pair and its sense classification into orders of derivation. This illustrates difficulties in the analysis of SD, and how various interpretations may lead to various analyses: If the nominal sense is taken as the base, the analysis into orders of derivation produces model A, whereas if the verbal sense is interpreted as the base, model B obtains:[58]

piss$^{N(1)}$(SUBSTANCE) → *piss*$^{V(1)}$(EFEFCTIVE) → *piss*$^{N(2)}$(ACTION)
piss$^{N(1)}$(SUBSTANCE) → *piss*$^{V(3)}$(EFEFCTIVE + INVOLUNTARY)
piss$^{N(1)}$(SUBSTANCE) → *piss*$^{V(2)}$(SIMILATIVE_FEFCTIVE)
piss$^{N(7)}$(EXT_PHR. ACTION) → *piss*$^{V(11)}$(EXT_INSTRUMENTAL_INGESTING)
piss$^{V(11)}$ → *piss*$^{N(3)}$(EXT_PHR.EVENT)

Figure 5.4.1.1. Model A: Directionality for related senses of the pair *piss*$^{N/V}$

[58] The senses are given as super index and between brackets, following the word-class category specification. Note that further senses are possible, even if most are phrasal expressions which seem to emerge within lexemes, making the picture in *piss*$^{N/V}$ quite complex, e.g. *piss and wind* or *get piss wet*, for the noun, or *to piss away* for the verb.

piss$^{V(1/3)}$(SUBSTANCE EMISSION) → *piss*$^{N(1)}$(RESULT)
piss$^{V(1/3)}$(SUBSTANCE EMISSION) → *piss*$^{N(2)}$(ACTION)
piss$^{V(2)}$(EXT_SUBSTANCE EMISSION) ?
piss$^{V(11)}$(EXT_SUBST. INGESTING) → *piss*$^{N(3)}$(EXT_PHR.EVENT)
piss$^{V(11)}$(EXT_SUBST. INGESTING) → *piss*$^{N(7)}$(EXT_PHR.ACTION)

Figure 5.4.1.2. Model B: Directionality for related senses of the pair *piss*$^{N/V}$

The senses in the Figures together with examples of use in the BNC are available in Appendix C.3.4.3, and they follow below for convenience too:

(103) *piss*^{N}
sense 1 (SUBSTANCE (OR RESULT))
"1. Urine, esp. evacuated urine." (OED), e.g. "*Some of the lights in the tunnel are busted, and it smells of* **piss**." (BNC)
sense 3 (analysed in context) (EXT_PHR_EVENT)
"Piss-up N: an occasion when a lot of alcohol is drunk" related to "3. Alcoholic drink; esp. drink which is regarded as weak or unpalatable alcohol. Cf. on the piss at Phrases 3 and gnat's piss n. at gnat n.1 Compounds, panther piss n. at panther n. Compounds 2." (OED), e.g. "*[…] its fucking well out of order* **piss** *up games oh that's right I think we played in, I think we played, you know that British bull dog thing?, we managed to clear*." (BNC)
sense 7 (P3) (EXT_PHR_ACTION)
related to 3 above "P3. Chiefly British, Australian, and New Zealand. on the piss: out drinking; engaged in a bout or bouts of heavy drinking. Conversely off the piss." (OED), e.g. "*'Gawd help us all, look at the state of you! No need to ask who's been on the* **piss** *all weekend, and not for the first time.*" (BNC)

(104) *piss*^{V} (EFFECTIVE (OR SUBSTANCE EMISSION))
sense 1 "1. a. intransitive. To urinate." (OED), e.g. "*I* **pissed** *in a test-tube, had four injections and did twenty press-ups to get my heart going*." (BNC)
sense 2 (SIMILATIVE_EFFECTIVE)
"2. a. transitive. To discharge (something, esp. blood) as or with urine. Also with out." (OED), e.g. "*Purple and black bruises abounded. 'I've been* ***pissing*** *blood all night, Tony.*" (BNC)

sense 3 (EFFECTIVE + INVOLUNTARY (OR SUBSTANCE EMISSION))
"3. transitive. To urinate in or on (one's clothing, bed, etc.), esp. involuntarily, as through fear, excitement, or amusement. Frequently reflexive in same sense. Also used hyperbolically, to suggest intense fear, excitement, amusement, etc." (OED), e.g. "*Maybe it was best this way, he thought, no time to consider, no time to get scared and* ***piss*** *down your pants leg.*" (BNC)
sense 11 (EXT_INSTRUMENTAL_INGESTING)
(analysed in context: "to drink alcohol, to get drunk" (my definition), e.g. "*[…] greeted the bands with abuse and bottles of cider which they had feverishly* **pissed** *in.*" (BNC)

Figures 5.4.1.1 (model A) and 5.4.1.2 (model B) illustrate how the organization of senses and sense connection may fit several different analyses, as is sometimes the case with semantic categorization. Still, there are few cases where the criterion of SD is unclear regarding senses in the first order of derivation.[59]

In model B, however, one of the senses (sense 2, with SD towards a counterpart sense in the noun) would need to be interpreted as extended from the verb, even if it uses the noun in its definition too. Thus, even if the analysis may be ambiguous, model A seems more fitting. Model A also shows recursive patterns, typically found in cases of conversion where the analysis of SD is clearer too. Thus, the analysis of senses defined using affixation should be carefully examined and, while further research is needed in this regard, it is here argued that it can in principle be considered reliable.

These aspects of SD should be clearly defined, at least with regard to whether a restrictive or an inclusive interpretation of SD is taken, e.g. if it allows the interpretation as showing SD or not for senses which are defined based on synonyms (also by affixation). This thesis argues for an inclusive interpretation, as senses in other word-formation processes are not always defined using the counterpart term, and synonyms play a role too, to cite one such case (cf. Ruz & Cetnarowska 2023).

[59] Admittedly, the analysis in this thesis may be considered too conservative in that SD is marked as *unclear* when considered ambiguous but where one may perceive a directionality (cf. the examples marked as unclear (*?*) in Sections 3.4.5.1 and 4.3.1). If anything, this may lead to a higher applicability of the criterion by a different linguist.

Last, as has been mentioned throughout, the analysis in this thesis differs from previous studies in that it is applied at the level of sense (following Plank 2010, and as opposed to considering core senses by lexemes, e.g. as in Bram 2011). The approaches differ mainly in that a sense analysis identifies multiple recursive derivation or multiple directions within pairs of lexemes, as illustrated in this chapter, whereas an analysis of core senses will identify unidirectional solutions as a tendency.

5.4.2 Semantic Pattern (SP)

SD and SP are separate criteria, and they do not necessarily always show together, i.e. a sense may show SD towards its counterpart sense, but not a SP typical of a derivative, and vice versa. However, the results in this thesis show that they typically go together in conversion. Ruz & Cetnarowska (2023) showed very similar results for the two criteria in affixation.

Even if the application of SP is, in principle, easier than that of SD, in the sense that various references on the typical semantic patterns used in conversion or other word-formation process can be found in the literature (Marchand 1969; Clark & Clark 1979; Plag 1999, among many others), the direction remains an issue in some cases, e.g.:

(105) *whoop*^{N} (INSTANCE/RESULT (OR SOUND))
sense 1 "1. A cry of 'whoop', or a shout or call resembling this, used to attract attention, as a summons, or to express derision, defiance, support or encouragement, etc., or (now usually) exuberant excitement; spec. (Hunting) a cry of encouragement or celebration, esp. at the kill (cf. whoo-whoop int. and n.); a cry or yell on rushing into battle, esp. one used by (or said to be used by) North American Indians (cf. war-whoop n.)." (OED), e.g. "*Chaka Khan has been around forever, and recently her trademark* **whoops** *and screams have sounded a little forced.*"

(106) *whoop*^{V} (EFFECTIVE_MANNER OF SPEAKING (OR SOUND EMISSION /MANNER OF SPEAKING))
sense 1 "1. a. intransitive. To utter a 'whoop!' or a cry or shout resembling this, typically in order to attract attention, as a summons, or to express derision, defiance, support or encouragement, etc., or (now usually) exuberant excitement. / c. transitive. With direct speech as object: to say or utter (something) with a whoop; to call out

or yell excitedly." (OED), e.g. "*A sense of adventure invaded the group, everyone* **whooping** *and yelling as they were flung between towers on their way to Athena Gardens, […]*".

Regardless of subjective intuitions, the direction between the pairs of senses based on SP remains unclear in this thesis, because both noun sense 1 and verb sense 1 show a SP typical of a derivative (at the same time both senses are analysed as showing SD). Interestingly, here, as with other cases which are also interjections, the direction seems more difficult to establish, e.g.:

(107) "*Most eventually got honorary Lifetime Achievement Awards - alias the '***Whoops***, sorry, we forgot you' Oscars, or even '***Whoops***, sorry, we didn't know you were still around'*" (BNC)

This and other examples where the direction seems to be unclear according to SD or SP, fuel the discussion on the notion of bidirectionality.

Last, even though the aim is always an unbiased analysis, e.g. by using OED definitions, it must be noted that the OED is constantly under revision. As entries may vary, so may the results of the analysis of the criteria change too, e.g. as in *anagram*$^{N/V}$, here cited as a clear example of Noun-to-Verb conversion (following OED2, senses in grey are not attested in the BNC):

(108) *anagram*^{N} (ABSTRACT_LANGUAGE TERM)

sense 1 "1. A transposition of the letters of a word, name, or phrase, whereby a new word or phrase is formed." (OED), e.g. "*Adam loved words, was fascinated by them, their meanings and what you could do with them, with* **anagrams** *and palindromes and rhetorical terms and etymology.*"

sense 1 "†2. loosely or fig. A transposition, a mutation. Obs." (OED) (not attested in the BNC)

(109) *anagram*^{V} (EFFECTIVE)

sense 1 "1. trans. To anagrammatize v." (OED) (no transitive use attested in the BNC)

sense 2 "2. intr. To make anagrams." (OED), e.g. "*He began* **anagramming***, twisting letters round, keeping in mind where they had been going, where Mary was still going […]*"

By contrast, the dictionary entries revised as OED3 cause major changes:

(110) *anagram*^{N} (OED3)
sense 1 "1. A word, phrase, or name formed by rearranging the letters of another word, phrase, or name."
sense 2 "2. figurative. A rearranged or encoded version of something; a transposition."
sense 3 "3. In plural. Any of various games in which players rearrange the letters of a word, phrase, or name to make another word, phrase, or name."

(111) *anagram*^{N} (OED3)
sense 1 "1. transitive. To rearrange the letters of (a word, phrase, or name) to form another word, phrase, or name."
sense 2 "2. intransitive. To compose or solve anagrams. Also with †upon. rare before late 20th cent."

Thus, even if the same direction is identified based on senses in use, the analysis is not straightforward, for the more complex description of sense 1 for the verb. Changes may influence the analysis of other criteria based on OED data too. For *anagram*, the analysis of RU used here would differ because OED2 marked the verb senses as rare or obsolete (thus, based on RU a Noun-to-Verb direction was identified), while the OED3 entries do not. An analysis based on the OED3 entries would thus show no direction based on RU, because none of the senses attested is cited as in restricted use.

This example is intended to show that dictionary makers' decisions may affect the analysis, and that this is a major methodological issue, even if it has been identified in few cases.

5.4.3 Semantic Range (SR)

Section 5.4.3 first discusses the reasons why a qualitative analysis of SR was carried out in this thesis and then delves into specific difficulties of the qualitative analysis of SR and their implications for the relevance of the criterion to identify directionality in conversion.

Although qualitative analysis was carried out in the sample of noun/verb conversion to test the criterion of SR, results of comparing the number of senses of each lexeme in the OED (as described in Section 3.3.2.3.1 for the pilot study on affixation) are not provided. This is because

measurement and comparison of paronymous lexemes, by counting the number of senses that each lexeme can take, e.g. as in a dictionary, corpora, etc., is not always reliable, for various reasons:

i. for differences in sense representation in dictionaries, or similar language resources, e.g. in *brood*$^{N/V}$,
ii. even if one lexeme presents indeed a larger number of senses, their range may be similar or even narrower than that of its counterpart, e.g. *beep*$^{N/V}$ the verb with two senses, which are for transitive and intransitive (CAUSATIVE/EFFECTIVE) use related to the noun sense (ABSTRACT_SOUND),
iii. some pairs may present the same number of senses, but a difference in the SR covered may be easily identified, e.g. where restrictions in use are identified, or as in *slob*$^{N/V}$ where both noun and verb present three senses, but two of the verb senses relate to a different lexeme *slobber*^{V}; thus, the SR, according to the semantically-related senses in the pair terms, is Noun-to-Verb, or
iv. when many extended or figurative senses are available, they do not necessarily follow similar paths, and it may be unclear which pair member has a wider SR, e.g. *snuff*$^{N/V}$.

Partly for these reasons, and because a comparison of the number of senses between lexemes did not prove useful in identifying directionality in the pilot study on affixation, a qualitative analysis of the SR covered by the pairs was carried out. However, several other issues emerged in the qualitative application of the criterion. These issues are partly related to the flexibility in the interpretation of the criteria.

One obvious methodological issue of this study, especially in the analysis of SR, is that results may differ substantially according to various approaches (e.g. diachronic vs synchronic). This is because use of all senses (e.g. in the OED) vs only the senses in use nowadays (e.g. in the BNC) may signal different directions for the same pairs. For instance, an analysis of the pair *swipe*$^{N/V}$ based on the senses represented in the OED signals that the noun is the base lexeme, but if only senses in use are considered, the lexemes cover a very similar SR (as the senses in use for the pair seem to be in both the noun and the verb). In addition to the senses shared by both lexemes, a slang sense is recorded for the verb "4. transitive. To steal, 'appropriate'; to loot. slang (originally U.S.)" (OED, 22 occurrences in the BNC), but no counterpart is

available in the noun. The analysis according to SR thus differs substantially, because some of the senses in the pair are obsolete or have a restricted use.

SR was difficult to interpret in some cases precisely because the lexemes may develop senses that are not related to any of the senses in the counterpart member (whether in use or not), or because one of the pairs may derive senses by influence from other lexemes, e.g. *slob*$^{N/V}$ (because the verb presents senses related to another lexeme *slobber*^{V}). When the senses in each lexeme develop differently, the criteria are more difficult to use. These issues become problematic in polysemous items.

Note that the criterion of SR was not tested specifically by pairs of senses, as the other criteria in this thesis. While this may make sense in principle, it is here believed that the criterion would then be similar to the interpretation of RU, as one of the restrictions includes general senses while others are more specific or restricted. It is here argued that, just as in RU, the criterion would thus probably prove applicable for a low number of sense pairs. This is on the assumption that related senses in conversion often show the same meaning, except that with the differences concomitant to the change in word-class category, or as Sweet (1891–8, I: 39, cited in Valera 2017: 4) puts it: "[…] although conversion does not involve any alteration in the meaning of a word, yet the use of a word as a different part of speech naturally leads to divergence in meaning." (cf. the discussion in Valera 2017, and references therein). SR is then seen as a criterion that is best applied by considering the range of senses covered by conversion-related lexemes, but one which would not allow for the identification of directionality by senses.

If the results of the application of SR are considered, the criterion shows limited applicability. As described in Section 4.3.2, the SR covered by the pairs seems fairly similar for ca. 30% of cases, e.g. *coppice*$^{N/V}$, or *dupe*$^{N/V}$. Also, the semantic range covered by other pairs (15.49%) was close to similar, the differences not being sufficient to consider SR a reliable test on directionality. Additionally, for 4.87% of the sample pairs, SR was difficult to establish, e.g. because the senses developed differently.

The SR of one of the pairs is marked as covering a wider semantic range than the other member of the pair in some cases (49.56%), but this percentage is not large enough to consider SR a reliable test to identify the directionality of conversion. Based on the noun/verb conversion sample analysed, a fairly large number of pairs with a similar SR is expected to be found, especially within new formations, the lexemes typically presenting

just one sense each. As has been applied in this thesis, SR would only serve to identify a single direction between a pair of lexemes, while the possibility of multidirectionality would initially have no place. Even if SR was interpreted as a property between pairs of senses, a low applicability is expected too.

Finally, the interpretation of the direction according to SR was sometimes found to be misleading, even when it was established with certainty, i.e. when one of the pairs clearly shows a wider sense coverage than its counterpart, e.g. in *bombard*$^{N/V}$, *curtsy*$^{N/V}$ or *dragoon*$^{N/V}$. For instance, for the pair *bombard*$^{N/V}$, SR signals Verb-to-Noun direction as the verb presents a wider SR, but a closer look at the senses shows that the noun refers to the ARTEFACT while the verb's related sense is SIMILATIVE_INSTRUMENTAL. The additional senses in the verb are extended and figurative senses, which also express the category SIMILATIVE. Thus, based on the pairs' semantics (e.g. by SD), the direction should be the opposite (Noun-to-Verb).

All in all, the SR of the base is not necessarily wider than that of the derivative by conversion. This is in line with previous studies which argue that the direction motivation cannot be established just on the basis of lexical growth (e.g. Umbreit 2010: 306–307). The low applicability of the criterion, the fact that it identifies a single direction (as interpreted in this thesis), and the identification of misleading cases cast doubts on the applicability of SR to decide on directionality.

5.4.4 Restrictions of Usage (RU)

This thesis was first intended to compare the total number of restricted senses that a pair of lexemes shows. However, as described in Section 4.3.4, such a method did not establish a directionality between pairs of lexemes. This is because a number of misleading analyses (cf. e.g. *barrack*$^{N/V}$ in Section 4.3.4) were easily identified by comparing either:

i. the number of restricted senses by pair, or
ii. the percentage of restricted senses out of the total number of senses that a lexeme takes by contrast with its pair member.

Thus, RU is considered in this thesis by comparing the analysis of the restrictions of usage between pairs of senses related by our arrangement into orders of derivation. Still, the results show that the criterion has a low

applicability: It signals a direction only in few pairs of senses (22.56%) and, consequently, in few lexemes when senses in the first order of derivation are considered (30.97%). As was described in Section 4.3.4 (cf. Table 4.3.4.4 on the applicability of RU by sense pairs), the low applicability of the criteria is due to the following factors:

i. both senses show RU, as in *graft*$^{N4/V3}$, because both the nominal sense "a. Work, esp. hard work." (RESULT)[60] and the verbal one "intransitive. To work." (ACTION) are marked as slang in the OED, or
ii. none of the senses shows RU, as in *cloister*$^{N/V}$, because neither the nominal sense "2. a. A place of religious seclusion; a monastery or nunnery; a convent." (ABSTRACT_LOCATION/PLACE) nor the counterpart verbal sense "1. transitive. To shut up, enclose, or place in a cloister or monastic house." (LOCATIVE) are marked as restricted.

RU seems to identify directionality in few cases, and sometimes the analysis is complex, as in the following BNC occurrence of *wax*^{N}:

(112) "*The Seven would be the agents of their own destruction. For the boy carried within him not a ball of* ***wax****, but an idea. One single, all-transforming idea*." (BNC)

This concordance was classified as part of *wax*^{N3} "*colloquial or slang*. Angry feeling; a fit of anger; chiefly **to be in a wax**." and interpreted as sense 9b in *wax*^{V1} (112), but it is also analysed based on a separate entry in the OED for the phrase *ball of wax* (113):

(113) "II. With complement: to change by growth or increase, to become. (Cf. grow v. 12) 9. a. With adjective complement:(a) With more or less of the idea of growth or increase: to become gradually, grow./(b) Without the idea of growth or increase: To become, turn. (Sometimes used with reference to a sudden or immediate change.) […]",

[60] Note that these were classified as ACTION and RESULT. However, their direction is left as *unclear* for the criterion RU, but also for semantic criteria (SD, SP, and SR). Admittedly, this analysis may be biased by the relation of the senses with two other lexemes (following the information in the OED): *graft*^{V2} "dialect. intransitive. To dig. [see grafting-tool n. *Grafting Tool, a kind of curved spade made very strong for the purpose of digging canals*.]" and *graft*^{N3} "2. A kind of spade, used in digging drains".

(114) "[…] (b) slang (originally and chiefly U.S.) a distinct matter, affair, concern, or situation, (one's) interest; the whole ball of wax: everything relating to a particular situation, the entire matter, the whole thing".

The criterion of RU is useful for this specific pair of senses, because the nominal use is restricted to the phrasal expression and because it is a slang sense, while the verb seems of more general use. However, if the sense is considered as specifically related to the phrase "to wax angry", it should be noted that this phrase is marked as archaic in the OED (not in the sense provided above, but as part of the etymological information provided for *wax*^{N3} described as "Of doubtful origin; possibly evolved from some phrase like to wax angry (archaic), to wax warm (now dialect): see wax v.1 II.9a.ii.". Use of this specification instead of the sense description leads to a rather unclear analysis of the direction of the pair according to RU.

Note also that, even when RU seems applicable, according to the number of senses showing RU for the pair, this does not necessarily signal a consistent direction, i.e. the analysis of RU might be misleading and clash with the results of the application of other criteria. For instance, two pairs of senses are related for the pair *varnish*$^{N/V}$:[61]

(115) *varnish*^{N}

Sense 1a (SUBSTANCE/MATERIAL) "1. a. Resinous matter dissolved in some liquid and used for spreading over a surface in order to give this a hard, shining, transparent coat, by which it is made more durable or ornamental. In early use, dry resinous matter for making a solution of this kind." (OED), e.g. "*The whole hood is then varnished with several coats of 'tinted'* **varnish** *(at least one inside) or to save money your choice of leftover paint.*" (BNC)

Sense 2 (FIG_QUALITY) "2. figurative. a. A specious gloss or outward show; a pretence." (OED), e.g. "*[…] were a celebration of Seventies flamboyance, late Eighties neurosis and Nineties positivism. Their high-kitsch* **varnish** *was offset by an overwhelming urge to educate*." (BNC) (senses

[61] Although both lexemes present further senses, those are analysed as extended within one or the other word class, or as senses derived recursively or in subsequent orders of derivation, e.g. the ACTION/INSTANCE deverbal sense "An act of varnishing; an application of varnish." (cf. the discussion in Section 5.4.6).

(116) *varnish*[V]

Sense 1a (INSTRUMENTAL/ORNATIVE) "1. a. transitive. To paint over, to coat, with varnish; to overlay with a thin coating composed of varnish." (OED), e.g. "*Whilst we were at it, we thought we'd strip the floor and* **varnish** *it.*" (BNC)

Sense 3 (FIG_ORNATIVE) "3. To cover or overlay with a specious or deceptive appearance; to gloss over, disguise." (OED), e.g. "*I was pleased to see his grin* **varnish** *when Mala gave him the vicious edge of her tongue for ignoring the Ardakkean request for discretion* […]" (BNC)

For the analysis of *varnish* in the first order of derivation, then, the criteria were compared between:

i. the nominal sense 1a and the verbal sense 1a, and
ii. the nominal sense 2 vs the verbal sense 3.

The analysis of RU reveals that none of the senses in i. show RU, while only the nominal sense in ii. is marked as figurative.[62] Thus, the study of RU based on the description of the senses in the OED leads to a Verb-to-Noun direction, which contrasts with the direction identified based on other criteria, e.g. SD or SP. Even though the OED has the authority to identify restrictions in the use of senses, care should be taken, especially when considering figurative senses.

Additionally, the application of RU in this thesis may be misleading too, i.e. although it serves to identify a direction between senses (granted for a low number of pairs), a direction was decided based on a computation of all the pairs of senses, and whether they show RU and thus indicate a direction or not. However, for some examples, various senses are identified as unrestricted while only one of the senses in one of the various pairs may be restricted. While RU may identify differences between senses or a direction between specific senses, it is unclear to what extent it identifies a direction between a pair, i.e. whether the identification of a single or few senses showing RU is enough to decide on a directionality in a polysemous pair when the criterion does not apply for other pairs of senses within the lexemes,

[62] Note, however, that the verb sense is also interpreted as figurative in the semantic categorization in this thesis as indicated by the semantic category provided among brackets (FIG_ORNATIVE).

in this case, in the first order of derivation. In this regard, it is argued that the search for a single direction may not make sense, even if only senses in the first order of derivation are considered.

The low applicability of the criterion and the complexities in its application lead to the conclusion that RU:

i. does not identify directionality in most cases, it is applicable only in very specific cases, and
ii. makes sense only when applied at the level of sense.

Thus, it is argued here that the criterion should be regarded as secondary.

5.4.5 Quantitative-distributional criteria: FO and RR

Section 5.4.5 discusses the issues found in the analysis of quantitative-distributional criteria, namely frequency of occurrence (FO) and the range of registers covered by the pairs (RR) together, because these are analysed based on the same source, and their application raises similar questions.

Quantitative-distributional criteria (FO and RR) stand out as objective, empirical, and measurable criteria, but their results may differ according to the source used for their study, specifically according to:

i. the size of the corpus, and
ii. the varieties of English or the registers represented by corpora.

Issues regarding the use of FO are highlighted elsewhere (cf., among others, Štekauer 1996: 129, Umbreit 2010: 309). Regarding point i., note, e.g. that Balteiro (2007) used a rather small corpus (ICE corpus, ca. one million words) and admits that the frequency of use of the lexemes should be studied using a larger corpus. Use of a data source that is not representative enough for research on directionality in conversion may become a methodological issue, e.g. many of the terms have a low frequency of use and, more relevantly, many do not occur in the corpus (Balteiro 2007: 126–129). This becomes even more problematic if directionality is studied by senses, as a larger number of senses would not be attested. By contrast, Bram (2011) uses three corpora to test FO across lexemes, and a higher number of pairs were reported to be found in the larger corpus (the BNC, a 100 million words corpus) (Bram 2011: 240, 261).

In this thesis, the BNC was selected as a data source because it is a large corpus and includes texts from various registers. It is thus considered a representative source to include the lexemes and the senses of the polysemous lexemes in our sample. Admittedly, different results might be found if a different corpus is used, e.g. a corpus of a different variety of English such as American English, especially regarding the criterion of RR. Also, the BNC represents the usage of British English in the late 90s, and recent senses may not be represented.[63] However, FO and RR results are expected to vary only for a limited number of senses, like slang or dialectal senses, while the usage of more general senses is not expected to vary much across corpora.

5.4.5.1 Level of application: lexeme vs sense

Another crucial difference between the research in this thesis and previous research on directionality is the level of application of the criteria: lexeme vs sense. Previous studies compared the frequency by lexeme pairs. More recently, Ševčíková (2021: 107, on directionality in Czech conversion) mentioned that the criterion of FO was not used in her study because the corpus used is not disambiguated for senses, arguing that an adequate analysis of the criterion is therefore impossible. This thesis agrees with Ševčíková's (2021) claim and argues, in line with Plank (2010), that an analysis of directionality should be carried out by senses and not by lexemes.

In this thesis, thus, FO and RR are researched by senses. As the BNC is not disambiguated by sense, senses were manually identified by a classification of the BNC's concordances into the senses of the OED for each term. It must be noted that a sense classification of the concordances is considered relevant even in an analysis which does not considers senses, because it involves:

i. the concordances' reclassification as the correct word class (where mistakes in the word class indicated by the corpus were found), and, by extension,
ii. the identification and separation of senses of homonymous lexemes.

[63] Note that recent senses may not be included in the dictionary used too, even if the OED is under constant revision. In fact, examples of senses in the BNC not represented in the OED were identified, and definitions were provided ad hoc (e.g. sense 5b for *soak*^{N} in Section 4.3.1).

I argue that these two steps are necessary to avoid including unrelated instances and to identify homonymous lexemes because these could affect:
i. the FO between lexemes, and
ii. ultimately, the directionality indicated by FO.

To highlight the relevance of this point, examples from Tables 3.4.5.5.1 and 3.4.5.5.2 in the method chapter are recalled here to illustrate the variation in the frequency of occurrence of some pairs after concordance reclassification and the separation of senses into homonymous lexemes were carried out:

Table 5.4.5.1. Exemplification of the variation of the raw frequency of some sample terms and the variation of the directionality signaled by FO after concordance reclassification [examples originally from Tables 3.4.5.5.1 and 3.4.5.5.2]

Pairs	Initial frequencies		Direction By FO	Revised frequencies		Direction By FO
	Noun	Verb		Noun	Verb	
barter	83	109	Verb-to-Noun	121	71	Noun-to-Verb
pinion	29	19	Noun-to-Verb	21	27	Verb-to-Noun
graft	185	187	Verb-to-Noun	210	162	–
graft$^{N1/V1}$				122	147	Verb-to-Noun
graft$^{N3/V2}$				11	1	Noun-to-Verb
graft$^{N4/V3}$				52	9	Noun-to-Verb
graft$^{N5/V4}$				25	5	Noun-to-Verb

As the steps proposed (i.e. the reclassification of concordances as their correct word class and the identification and separation of homonymous lexemes, cf. also Sections 3.4.3 and 3.4.5.5) are time-consuming, perhaps the use of other corpora or data sources fitted with sense information alongside the word class would simplify the process in future research.

5.4.5.2 FO and RR: issues in their applicability

Concerning the applicability of the two criteria, several issues are identified. First, it is argued that the criteria are not applicable to identify a directionality when the values in terms of FO or RR are too close or too low. In this sense, deciding from which point a difference in FO or RR is relevant or not is a necessary step for the correct interpretation of the criteria. This is noted in previous references too (among others, Umbreit 2010: 309). Specifically, this

study uses a Chi-squared test to identify significance levels between the differences in the frequency of occurrence of the senses. For RR, Fisher's Exact Test was used to identify significance levels between the differences in the range of registers covered by the senses. As mentioned throughout, however, the applicability of the statistical test in RR remains controversial because the categorical values in RR (i.e. the number of registers in which a sense can appear in the BNC) are typically low.

If significance levels are established, the applicability of the criteria decreases, because the difference between senses is considered relevant for a lower number of pairs. Also, as discussed from a cross-consistency analysis of the criteria (Section 5.4), if significance levels are established, the consistency levels with other criteria are naturally lower too. This is a relevant point, especially because it is sometimes disregarded in previous studies on directionality in conversion, e.g. in Bram (2011) or Kisselew et al. (2016), or doubtfully established using different methods. For instance, Balteiro (2007: 127–129) proposed to establish the average difference between conversion pair types and to interpret the direction as unclear if the difference between a pair of lexemes is lower than 25% of the average for each direction. However, she acknowledges the limitations of this method, as it cannot be generalized because it is based on calculations from her sample, which is barely representative.

Regarding the applicability of the criteria, FO proved applicable for nearly 75% of the pairs of senses. For RR, two register classifications were tested in this thesis. The results show that a more fine-grained classification gives better results for the directionality of the pairs. As mentioned throughout, this is because the registers covered by a pair of senses will most likely differ for a higher number of pairs if the number of registers into which they are annotated is higher too. Similarly, the consistency of RR with other criteria is higher when the classification into a higher number of registers is considered, simply because it solves directionality in more cases.

For the same reasons, FO solves directionality between senses for a higher number of pairs, i.e. because as lexemes with frequency up to 1,000 are included, there is a higher chance that the difference in the frequency of occurrence will significantly differ for a higher number of pairs of senses.

As for their results, consistency levels between FO and RR reveal that both criteria suggest similar tendencies. To which extent they do signal the same direction or not varies greatly according to whether significance

levels are considered for RR, because the statistical test proved a significant difference only for a limited number of pairs of senses in RR (39.85%, cf. Table 4.3.6.5) due to the low number of registers in which senses can appear (up to 71 categories). I argue that the point from which a difference in frequency or the range of registers covered by senses needs to be established. However, while for FO the statistical test applied seems to provide results as expected, further research is needed to establish significance levels regarding RR between pairs of senses.

Thus, if significance levels are considered, RR does not seem to be applicable and should be given secondary importance. If these are omitted, the results are in line with those of FO, although some cases in which the direction by these two criteria differ are found too.

More generally, the consistency levels of FO and RR with other criteria reveal similar tendencies too (RR being less consistent because its applicability is lower). In general, the consistency of these criteria seems to be higher with SD or SP. However, as discussed in Sections 5.3.5 and 5.3.6, consistency levels are not as high as expected. This is because it was presumed that the criteria would point to the correct directions and thus align for the same pairs. Indeed, a closer look reveals that the criteria signal opposite directions for a rather large number of pairs (cf. Tables 5.3.5.2 and 5.3.5.3 for the consistency between FO and SD or SP respectively, where both are applicable, and Tables 5.3.6.2 and 5.3.6.3 for the comparison between FO and SD or SP in the same terms).

As discussed in Sections 5.3.5 and 5.3.6, these numbers cast doubt on the applicability of the criteria. This may be because, even if FO or RR may as a tendency signal the same directions for a number of pairs of senses, because it is expected for the base to be more frequent than the derived counterpart sense, or to appear in a wider range of registers, this is not necessarily the case. In fact, previous research has pointed out this fact, especially regarding the limited reliability of FO between lexeme pairs (Umbreit 2010: 309). Previous studies on directionality in conversion mention that FO is a poor predictor for Verb-to-Noun conversion too (cf. Bram 2011: 234; Kisselew et al. 2016: 97). This is, however, when FO is contrasted with AD. Specifically, Kisselew et al. (2016: 97) mentions that "[…] frequency is a poor predictor of the direction of derivation […] possibly because semantic regularity allows usages to become entrenched".

Examples of misleading cases are found in our sample too, i.e. where FO or RR seem to give a wrong interpretation of directionality. For instance, *bombard*$^{N/V}$ is an example in which senses identified as derived are more frequent than base senses:

(117) *bombard*^{V}

sense 1 (ARTEFACT; five occurrences in the BNC)

"1. a. The earliest kind of cannon, usually throwing a stone ball or a very large shot. †b. transferred. The ball or stone thrown by a bombard. Obsolete. rare—1." (OED), e.g. "*[…] and the big hooped* **bombards** *and mortars, repositioned, were firing their three-hundred pounders as frequently as* **bombards** *were ever able to do, with a hundred balls beside each to do it with*." (BNC)

Sense 2 (ARTEFACT; two occurrences in the BNC)

"2. A bomb-vessel or bomb-ketch; = bomb n. 4." (OED), e.g. "*There was no softening in his stare. He said, 'Niccolò vander Poele. I am told there are* **bombards***. Did you plant them?'*" (BNC)

(118) *bombard*^{V}

sense 1/2 (SIMILATIVE_INSTRUMENTAL; 60 occurrences in the BNC)

"†1. intransitive. To fire off bombards or heavy guns. Obsolete (except as absolute use of 2). / 2. transitive. a. To batter with shot and shell; to assault with ordnance so as to destroy, disable, or reduce to submission." (OED), e.g. "*Witnesses describe how the army initially* **bombards** *an area of marshes to drive away the population.*" (BNC)

Additionally, the verb presents further extended and figurative senses. In fact, the most frequent sense in the pair is its figurative use (FIG_SIMILATIVE) "2. b. figurative. To assail with persistent force or violence." (OED), e.g. "[…] we are actually **bombarded** by an increasingly heterogeneous mix of musical methods and messages […]" (BNC).

A higher frequency of occurrence is quite often observed for figurative senses within pairs, which in this thesis, however, are often classified in the second order of derivation. Note that, if senses were not classified into orders of derivation, FO results would differ for some pairs, e.g. in *pillory*$^{N/V}$, because the figurative sense of the verb is more frequent than the related figurative sense of the noun, or the sense pairs in the first order of derivation (sense 1 for the noun and verb). Thus, if the direction is considered between lexemes, it would be Verb-to-Noun because the figurative use of the

verb shows a higher frequency, whereas an analysis by senses into orders of derivation signals an unclear direction based on FO in the first order (because the frequency of the senses in the first order is too low), and a Verb-to-Noun direction in the second order:[64]

(119) *pillory*^{N}

sense 1 (INSTRUMENT; nine occurrences in the BNC)

"1. A device for punishment, usually consisting of a wooden framework mounted on a post, with holes or rings for trapping the head and hands, in which an offender was confined so as to be subjected to public ridicule, abuse, assault, etc.; punishment of this kind. Now historical. (In Great Britain the punishment of the pillory was abolished, except for perjury, in 1815, and totally in 1837. In Delaware, U.S., it was not abolished till 1905. In quot. c1390: Christ's cross.)" (OED), e.g. "*had followed the King's army from London to Coventry was 'taken by the soldiers, and first led about the city then set in a* **pillory***, after in a cage then ducked in a river, and at last banished the city'*" (BNC)

Sense 2 (EVENT/INSTANCE/RESULT; one occurrence in the BNC)

"2. figurative. Public abuse, ridicule, or defamation; subjection to abuse, humiliation; a place in which a person or thing is subjected to abuse; (also) a person subjected to abuse." (OED), e.g. "*was frankly un désastre and that I was amazed she had walked the streets to my apartment in broad daylight and escaped* **pillory**." (BNC)

(120) *pillory*$^{N/V}$

sense 1 (INSTRUMENTAL; five occurrences in the BNC)

"1. a. transitive. To put (a person) in a pillory; to punish by means of a pillory. Now historical. / †b. transitive. In extended use: to constrict (a person) as though in a pillory. Obsolete." (OED), e.g. "*Samuel Butler and others have* **pilloried** *the Victorian paterfamilias, and there were indeed families that suffered the tyranny of fathers using religion as […]*" (BNC)

sense 2 (FIG_SIMILATIVE; 48 occurrences in the BNC)

"2. transitive. figurative. To abuse, ridicule, or defame (a person or thing); to expose to public abuse or ridicule; to reproach." (OED), e.g.

[64] The analysis of FO gives closer results to that of the criteria of SD or SP, where the direction identified is Noun-to-Verb in the first order and Verb-to-Noun in the second order.

"*Within days of the episode, vicious rumours had spread throughout Ayrshire, Rough's children were* **pilloried** *at school and his wife was humiliated on future shopping trips.*" (BNC)

Additionally, as was mentioned earlier (cf. Sections 4.2 and 5.2.2), the classification in this thesis allows to identify related pairs of senses, and senses extended within lexemes but for which no counterpart sense is found in the derivative. If this difference is overlooked, dissimilar results are obtained for some pairs, e.g. *twit*$^{N/V}$:

(121) *twit*^{N1}

sense 1 (INSTANCE/RESULT; one occurrence in the BNC)

"1. a. A criticism or reproach, esp. one made in a good-humoured or teasing way; a taunt, a jibe. Cf. twit v. 1a." (OED), e.g. "*[…] that's concise enough to be published whilst covering all the points you want to raise - especially in reply to* ***twits*** *like. Still, I'll work on it.*" (BNC)

sense 2 (EXT_HUMAN+CHARACTERISTICS; 65 occurrences in the BNC)

"2. b. colloquial (originally and chiefly British). A stupid, silly, or annoying person; a fool, an idiot." (OED), e.g. "*[…] laid out into seven levels, each offering a choice of two to move on to once completed. Confused? Look at the screenshot,* **twit***!.*" (BNC)

(122) *twit*^{V}

sense 1 (NEGATIVE JUDGMENT; five occurrences in the BNC)

"1. a. To censure, reproach, or upbraid (a person), esp. in a good-humoured or teasing way; to find fault with, to blame; to taunt." (OED), e.g. "*The good lady thought that he was shy, and constantly* **twitted** *him to bring him into the talk; Paul hoped that she would get over it as the days passed, and this proved to be the case.*" (BNC)

In the pair *twit*$^{N/V}$, the first sense in the OED for both the noun and verb entries is related. However, sense 2 for the noun is analysed as an extended use for which no counterpart verb sense is attested in the BNC. Thus, a comparison by lexemes would signal a Noun-to-Verb direction, while a sense analysis signals a Verb-to-Noun direction (N).

Thus, even though the criteria of FO and RR may signal a direction, their reliability remains unclear, even in cases where they show significant

differences between senses and where a direction can thus be signalled with certainty on the basis of these criteria, i.e. assuming that the direction identified signals directionality correctly. It is here argued that distributional criteria may not be as reliable for the study of directionality in conversion as previously thought. While they may serve to investigate the current usage of senses within pairs of lexemes, and even if they tend to signal a correct direction for a number of senses, their role in directionality is secondary, and their results should be considered always alongside semantic criteria, which prove more relevant for directionality.

5.4.6 Implications of the sense organization

This thesis focuses on the direction(s) between Noun/Verb pairs only for the senses classified as the first order of derivation. This has led to testing how well the criteria work to identify:

i. a direction between converted senses, if only one direction is identified in first order, independently of whether just a pair of senses, or several pairs of senses signalling the same direction are identified, or
ii. several directions in the first order too, e.g. where two more or less independent groups of senses are identified for the same lexeme.

Note, however, that the thesis identifies recursive sense derivation between the pairs of lexemes described as in subsequent orders of derivation, e.g. the first or the second order of derivation. Even if a single direction can often be identified, because the focus of the thesis is on senses in the first order of derivation, this thesis does not support an analysis of conversion in terms of *unidirectionality*. The results of this thesis show that several directions can be identified for 45 pairs (19.91%), which is a fairly high number, especially as not all lexemes in our sample show polysemy.

The classification of senses into orders of derivation is here argued to be an effective method for the identification of directionality in conversion. This is especially relevant for polysemous pairs, where several directions may be found according to the senses at hand.[65] Although the classification of the

[65] In this sense, derivational paradigms or networks seem suitable for the study of conversion, specifically of directionality and the semantic patterns that can be identified between paronymous lexemes (understood as in Cruse 1986, cf. the review in Valera & Ruz 2021).

senses may cause bias, because it relies primarily on semantic criteria, this is just as in any approach that relies on sense analysis.[66]

More generally, the classification of senses into orders of derivation touches on the issue of whether conversion:

i. involves different lexemes as in derivation by affixation, or
ii. involves just a pair of lexemes.

The first interpretation of the direction relations between senses is plausible but entails an analysis under which the issue of the proliferation of zeroes would be at hand. Orders of derivation in this thesis are intended simply as a means for representation of the various directions in sense extension between a pair of lexemes, which is established here according to sense analysis. The proposal here is, thus, that:

i. directionality or relations in conversion are to be studied by senses, and
ii. whereas sense relations may be parallel to the relations found between several pairs of lexemes formed by affixation this is not necessarily the case in conversion, i.e. directionality is here considered a property of senses within pairs of lexemes. The difference results from the fact that the semantic capacity of affixes is restricted while in conversion, because there is no formal mark signaling the change in word-class category, the semantic capacity of the lexemes is formally unlimited.

Under the approach adopted in this thesis, thus, the two representations for the pair *hoover*$^{N/V}$ in our sample, in Figures 5.4.6.1 and 5.4.6.2 below have the same implications. The organization in Figure 5.4.6.1 was used because it allows for easier identification and analysis of the criteria in subsequent sense extension within pairs related by conversion. This is without implying the existence of several lexemes in conversion relations. Note that only three of the senses identified for the pair are represented, but further derived and extended senses are found in the pair too.[67]

[66] Note again, however, that the sense analysis relies on information from the OED and is not just based on intuition.

[67] Appendix C.3.4.3 provides all senses in use for the lexemes together with an example of each sense in context.

hoover^{N} (INSTRUMENT) → *hoover*^{V} (INSTRUMENTAL) → *hoover*^{N} (ACTION)

Figure 5.4.6.1. Directionality for three related senses of the pair *hoover*$^{N/V}$

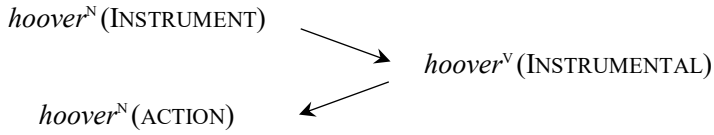

Figure 5.4.6.2. Directionality for three related senses of the pair *hoover*$^{N/V}$

5.5 SUMMARY

The discussion in Chapter 5 starts with some general remarks. Section 5.2.1 discusses how the methodological decisions may influence the results of the analysis of directionality, among others:

i. the sources selected,
ii. the level of analysis, i.e. lexeme vs sense, and
iii. an analysis of senses in use vs one comprehensive of all senses, including those no longer in use.

Section 5.2.2 justifies the assumption that a sense distribution into orders of derivation is the best option to test directionality by sense, even though it may cause some bias. Section 5.2.3 discusses the dissimilar extent to which the criteria can be applied at the level of sense, the most applicable criteria being SD and SD, and then FO to a lesser degree. Regardless of whether the directionality predicted by these criteria is correct, the applicability of these three criteria is over 75%. In contrast, SR, RR, and RU are not so viable as they display a low applicability, all under 55% at best.

Section 5.3. discusses the results across criteria, with a focus on how their consistency may vary according to how strictly the criteria are interpreted. This section shows that the consistency between some of the criteria is low, as may be expected, because some of the criteria do not exhibit high applicability. More importantly, it is shown that, e.g. if a direction is interpreted only where a significant difference between the frequency of occurrence of the senses is proved statistically significant, the applicability of

the FO naturally decreases. The way in which the criteria are interpreted may thus lead to disparate results, specially so as regards FO and RR. The identification of significance levels is necessary for a correct interpretation of the criteria.

Section 5.4 discusses and exemplifies issues regarding the relevance of the criteria. SD and SP seem to give the best results in a analysis of directionality by sense. However, the criteria are not without problems. Emphasis is laid on the following issues:

i. A redefinition of the criteria is needed or, at least, it should be defined whether a restrictive or an inclusive interpretation of a criterion is taken, e.g. whether SD applies only when the counterpart sense is mentioned in the definition of a sense, or if it applies also to senses defined based on synonyms (or also by parallel senses by affixation; cf. Section 5.4.1).
ii. Lexicographic decisions may affect the analysis. This is a major methodological issue, even if it has been identified only in some cases (cf. *anagram*$^{N/V}$ in Section 5.4.2).
iii. SR is interpreted as a criterion best applicable by lexeme. However, SR as interpreted in this thesis does not allow for the identification of multiple directions. The applicability of this criterion is also shown to be questionable (cf. 5.4.3), as a wider semantic range does not necessarily point to a consistent derivational direction. This is in line with previous claims that the direction cannot be established just on the basis of lexical growth (cf. Umbreit 2010).
iv. RU emerges as merely a secondary criterion, and one which is applicable in very specific cases and only at the level of sense.
v. Distributional criteria (FO and RR) may not be as reliable for the study of directionality in conversion as hitherto assumed. While they may serve to study the current usage of senses within pairs of lexemes, and even if they tend to signal a consistent direction for a number of senses with other criteria, their role in directionality is secondary, and their results should be considered always alongside semantic criteria.

Finally, Section 5.4.6 argues that the identification of recursive sense derivation in conversion as in subsequent orders of derivation is an effective approach to the study of directionality in conversion between polysemous pairs. The proposal in this thesis is, thus, in line with Plank (2010) that directionality is a property of senses between lexemes and should be studied at the sense level.

CHAPTER 6

CONCLUSIONS

6.1 INTRODUCTION

The issue of directionality in conversion has received considerable attention in the literature (cf. the review in Chapter 2). Within the approaches which view directionality as a relevant issue in conversion, several criteria have been proposed for its identification. The criteria discussed or applied in the literature, presented in Section 2.5, have often been transmitted uncritically. Their application, as in Bram's (2011) thesis, as the largest study on directionality in English conversion, reveals a degree of indeterminacy that remains unresolved to this day. The hypothesis in this thesis is that directionality in conversion remains a difficult issue:

i. for the difficulty inherent in the process of conversion,
ii. for the criteria used in the identification of directionality, and
iii. for the scale (lexeme vs sense) at which these criteria have been applied in previous references.

Regarding the latter point, as described in Section 2.4.3.3, even if the role of senses has been highlighted in the literature, directionality has often been studied at the level of lexeme. A major point of this thesis is that it takes the role of senses as the scale for the identification of conversion, following Plank (2010: 87). Specifically, this thesis focuses on testing several semantic and

quantitative-distributional criteria for directionality in a sample of present-day English noun/verb conversion, all in order to find out:

i. how feasible it is to apply the criteria at the level of sense (following Plank 2010), and
ii. how true Marchand's (1964) criteria for directionality are when applied by senses.

6.2 FINDINGS

6.2.1 The influence of methodological decisions

This thesis shows how various methodological decisions may affect the analysis of directionality. Not only does the use of criteria of dissimilar nature yield dissimilar results (cf. Section 2.5 for a review of the criteria proposed in the literature), but other methodological aspects may have an impact on the conclusions on the directionality between English noun/verb conversion pairs, among others:

i. the sources selected for the analysis of the criteria (lexicographic and corpus),
ii. the level of analysis, i.e. lexeme vs sense, and
iii. an analysis of senses in use vs one that examines all senses, including those no longer in use.

This thesis has also shown how different results are obtained according to the interpretation of the criteria. This calls for the need of a more precise description of the criteria when applied to conversion and elsewhere, as well as the need to establish significance levels when distributional criteria are studied. This applies not only to the study of directionality but also more generally to any study on differences in the usage of senses.

6.2.2 Relevance of the criteria

Previous studies on directionality compared the results of semantic or distributional criteria with that by other criteria. Notably in previous references, the direction indicated by semantic criteria is often compared with the direction indicated by etymology or dates of first attestation (cf. Balteiro 2007; Bram 2011; Kisselew et al. 2016). However, as noted in the literature, an approach to conversion from these two perspectives (diachronic vs

synchronic) often gives contradictory results (Marchand 1963a: 180; Adams 1973: 40; Cetnarowska 1993: 37–39; Bauer & Valera 2005: 11; Bram 2011: 90, among others; cf. also the description in Section 2.4.3.2 in this thesis). This is because the two approaches focus on different aspects of conversion.

The approach in this thesis is synchronic and the focus is on the directions that can be found in conversion according to the sense relations between pairs in present-day English. Consequently, in this thesis only semantic and distributional criteria (cf. Marchand 1964) are tested.

In this sense, a higher consistency between the results of the criteria tested in this thesis was expected. The results were not as expected in that:

i. low applicability was found for some of the criteria (SR, RR, and RU) for various reasons and, consequently, also a low consistency was found between these and other criteria, and
ii. even if the criteria focus on the use of the pairs synchronically, the results across criteria point to opposite directions in some cases, which casts doubts on the applicability of the criteria.

At a general level, it has been shown that:

i. SD and SP give the best results in a sense-based analysis of directionality, even though their applicability presents issues and the results are not always conclusive. Notably, the criteria do not prove to be conclusive in all cases even in overt affixation.
ii. Distributional criteria (FO and RR) may not be as reliable for the study of directionality in conversion as previously thought. While FO or RR may give an account of the current usage of senses within pairs of lexemes, and even if they tend to signal a direction for a number of senses, the direction by these criteria is not always correct, e.g. the derived sense is not necessarily always the most widely used one.
iii. The applicability of SR to study directionality is questioned, partly because it is a criterion which is best applied by lexemes, thus not allowing the identification of multiple directions at the sense level, and partly because it is argued that a wider semantic range does not necessarily point to a consistent derivational direction, even between monosemous pairs.
iv. RU is highlighted as a secondary criterion, and one which is applicable for very specific cases and only at the level of sense.

Regarding the aims of the study, this thesis shows that:

i. The criteria can be applied at the level of sense and the results obtained by a sense analysis are undoubtedly closer to how the derivational process may have operated in each case. However, the applicability of the criteria differs, and some of the criteria prove only applicable in specific cases (e.g. RU).
ii. The relevance of the criteria when applied by senses varies too and, while the semantic criteria of SD or SP seem to give the best results, a number of misleading cases are found in the application of other criteria, revealing e.g. that it is not always necessarily the case that the derivative sense is used less frequently than the base sense, or that the semantic range of the derivative is narrower.

Overall, the results show that directionality in conversion can hardly be ascertained according to Marchand's (1964) criteria viewed as a unitary set of criteria, even less when run according to senses instead of by lexemes. Directionality in English noun/verb conversion cannot be identified consistently by the set of criteria, if a perfect match across criteria is aimed at. Instead, the most frequent profile is one where some criteria clearly signal one direction whereas others signal the opposite.

6.2.3 Theoretical implications

In the previous literature, conversion has sometimes been claimed to be simply unpredictable (in terms of bidirectionality or multidirectionality) for the difficulties it poses, or it has been described as unidirectional too. In this thesis, several patterns are found for conversion pairs:

i. Sometimes conversion is unidirectional, i.e. a single direction can be found between some pairs: This is when lexemes present a single sense, or when only one of the senses of a lexeme undergoes conversion. However, as new senses may emerge for the lexemes and these may be converted in one or the other direction, the possibility for multiple conversion remains open.
ii. In other pairs, directionality is multiple, in that various directions may be found between pairs of lexemes, according to specific senses. The results of the sense analysis in this thesis prove that several directions can be found between polysemous lexemes. In contrast to approaches

that consider directionality as unpredictable, this thesis proves that, for most cases, a direction can be found between senses, and that this is best decided according to SD or SP.

iii. The criteria tested in this thesis do not prove applicable to decide on the direction between some pairs. Perhaps ambiguous cases, i.e. cases where both directions are possible based on a semantic analysis, might need to be described as bidirectional, with the implications that this may have for the description of conversion in related studies, e.g. for the semantic relations between conversion pair. Bidirectionality is understood here in the sense that both directions may be processed simultaneously. Perhaps some lexemes with a root origin may best fit this description.

The picture here presented shows that the description of the direction in conversion is better established between related senses and not between lexemes, and that a unidirectional approach makes sense only at the level of sense.

Finally, the identification of recursive sense derivation in conversion as in subsequent orders of derivation was argued to be an effective method for the identification of directionality in conversion between polysemous pairs. The proposal in this thesis is, thus, in line with Plank (2010) that directionality is a property of senses between lexemes and should be studied at the sense level.

6.3 LIMITATIONS AND FUTURE RESEARCH

This thesis only covers the directions between the senses identified in the first order of derivation between noun/verb conversion pairs. It remains for future research to determine:

i. whether the criteria perform better for the pairs of senses in the first or in the second order of derivation (as seems to be the case in affixation, cf. Ruz & Cetnarowska 2023), and at a more general level,

ii. the more frequent directional patterns in conversion, and

iii. the applicability of directionality criteria at a sense level and the patterns when other word classes are involved, e.g. adjectives.

Other limitations in this thesis are mainly methodological:

i. This thesis involves a great deal of manual analysis, especially as regards sense classification of concordances.
ii. Because all the concordances of the pairs of lexemes in the sample were manually classified into the OED senses, the sample was restricted to the frequency ranges 0–1,000. The sample in this thesis is considered representative in that polysemous lexemes are included too, but such a sample may not be representative of all the directional patterns or controversial issues in conversion in English.
iii. As in any semantic analysis, some degree of subjectivity may be involved, but this was prevented as far as possible by conducting an analysis according to the senses in the OED.

Regarding these limitations, it may be interesting to explore AI models to automatize sense categorization for future work, which may be useful for the classification of high-frequency lexemes.

CHAPTER 7

CONCLUSIONES

7.1 INTRODUCCIÓN

La cuestión de la direccionalidad ha recibido considerable atención en la bibliografía especializada sobre conversión (véase la revisión del capítulo 2). Dentro de los enfoques que consideran la direccionalidad como una cuestión relevante en la conversión, se han propuesto varios criterios para su identificación. Los criterios a debate o aplicados en la bibliografía especializada, presentados en la sección 2.5, se han transmitido a menudo de forma acrítica. Su aplicación, como en la tesis de Bram (2011), el principal estudio sobre la direccionalidad en la conversión del inglés, revela un grado de indefinición que sigue sin resolverse a día de hoy. La hipótesis de esta tesis es que la direccionalidad en la conversión sigue siendo una cuestión difícil:

i. por la dificultad inherente al proceso de conversión,
ii. por los criterios utilizados en la identificación de la direccionalidad, y
iii. por la escala (lexema frente a sentido léxico) a la que se han aplicado estos criterios en referencias anteriores.

En cuanto a este último punto, como resume la sección 2.4.3.3, aunque se ha destacado el papel de los sentidos léxicos, la direccionalidad se ha estudiado a menudo por lexemas. Un aspecto relevante de esta tesis es que adopta los sentidos léxicos como escala para la identificación de la conversión, de acuerdo con Plank (2010: 87). En concreto, esta tesis prueba varios criterios

semánticos y cuantitativo-distributivos de direccionalidad en una muestra de conversión sustantivo/verbo del inglés actual, todo ello con el fin de averiguar:

i. hasta qué punto es factible aplicar los criterios a nivel de sentido léxico (de acuerdo con Plank 2010), y
ii. hasta qué punto son válidos los resultados de los criterios de direccionalidad de Marchand (1964) si se aplican por sentidos léxicos.

7.2 CONCLUSIONES PRINCIPALES

7.2.1 La importancia de las decisiones metodológicas

Esta tesis muestra cómo las decisiones metodológicas pueden afectar al análisis de la direccionalidad. No sólo el uso de criterios de diversa naturaleza arroja diferentes resultados (véase la sección 2.5 para una revisión de los criterios propuestos en la bibliografía especializada), sino que otros aspectos metodológicos pueden repercutir en las conclusiones sobre la direccionalidad entre pares de conversión sustantivo/verbo en inglés, entre otros:

i. las fuentes usadas para analizar los criterios (lexicográficas y de corpus),
ii. el nivel de análisis, es decir, lexema frente a sentido léxico, y
iii. un análisis de los sentidos léxicos en uso frente a otro que incluya todos los sentidos, también los que están desuso.

Esta tesis también muestra cómo se obtienen resultados diferentes según la interpretación de los criterios. Esto hace necesaria una descripción más precisa de los criterios cuando se aplican a la conversión, pero también a otros ámbitos, así como la necesidad de establecer niveles de significación cuando se estudian criterios cuantitativo-distribucionales. Esto se aplica no sólo al estudio de la direccionalidad, sino también, de forma más general, a cualquier estudio sobre las diferencias en el uso de los sentidos léxicos.

7.2.2 Relevancia de los criterios

Los estudios previos sobre la direccionalidad comparaban los resultados de los criterios semánticos o distribucionales con los de otros criterios. En particular, la dirección indicada por los criterios semánticos se compara a menudo con la dirección indicada por la etimología o la primera fecha de registro (en la tesis, abreviado *AD* por *attestation date*) (cf. Balteiro 2007; Bram 2011; Kisselew et al. 2016). Sin embargo, como indica la bibliografía

especializada, una aproximación a la conversión desde estas dos perspectivas (diacrónica vs sincrónica) suele arrojar resultados contradictorios (Marchand 1963a: 180; Adams 1973: 40; Cetnarowska 1993: 37–39; Bauer & Valera 2005: 11; Bram 2011: 90, entre otros; véase también la descripción en el apartado 2.4.3.2 de esta tesis). Esto se debe a que ambos enfoques se centran en aspectos diferentes de la conversión.

El enfoque de esta tesis es sincrónico y se centra en las direcciones que se pueden identificar en la conversión según las relaciones de sentido entre pares en el inglés actual. En consecuencia, esta tesis sólo pone a prueba criterios semánticos y distribucionales (cf. Marchand 1964).

En este sentido, se esperaba una mayor coherencia entre los resultados de los criterios probados en esta tesis. Sin embargo, los resultados no fueron los esperados:

i. queda en evidencia una baja aplicabilidad de algunos de los criterios (SR, RR y RU) por diversas razones y, en consecuencia, también una baja coherencia entre éstos y otros criterios, y
ii. aunque los criterios se centran en el uso de los pares sincrónicamente, los resultados entre los criterios se orientan en algunos casos en sentidos opuestos, lo que arroja dudas sobre la aplicabilidad de los criterios.

En líneas generales, esta tesis demuestra que:

i. SD y SP ofrecen los mejores resultados en un análisis de la direccionalidad basado en sentidos léxicos, aunque su aplicabilidad presenta problemas y los resultados no siempre son concluyentes. En particular, los criterios no resultan concluyentes en todos los casos, ni siquiera en la afijación explícita.
ii. Los criterios distribucionales (FO y RR) pueden no ser tan fiables para el estudio de la direccionalidad en la conversión como se pensaba. Aunque FO o RR pueden dar cuenta del uso actual de los sentidos dentro de pares de lexemas, e incluso si tienden a señalar una dirección para una serie de sentidos léxicos, las conclusiones según estos criterios no siempre son correctas, por ejemplo, el sentido derivado no es necesariamente siempre el más utilizado.
iii. Se cuestiona la aplicabilidad de RS para estudiar la direccionalidad, en parte porque es un criterio que se aplica mejor por lexemas, por lo que no permite identificar múltiples direcciones por sentidos léxicos, y en

parte porque un rango semántico más amplio no apunta necesariamente a una dirección derivacional coherente, incluso entre pares monosémicos.

iv. RU destaca como un criterio secundario, aplicable a casos muy concretos, y sólo para los sentidos léxicos, no para lexemas.

En cuanto a sus objetivos, esta tesis demuestra que:

i. Se puede aplicar los criterios por sentidos léxicos, y los resultados obtenidos mediante dicho análisis se aproximan sin duda a cómo puede haber operado el proceso derivativo en cada caso. Sin embargo, la aplicabilidad de los criterios difiere, y algunos criterios ellos sólo son de aplicación en casos concretos (por ejemplo, RU).

ii. La pertinencia de los criterios cuando se aplican por sentidos léxicos también varía y, mientras que los criterios semánticos de SD o SP parecen dar los mejores resultados, se dan casos complicados en la aplicación de otros criterios. Esto revela, por ejemplo, que no siempre se da necesariamente el caso de que el sentido derivado se utilice con menos frecuencia que el sentido base, o que el rango semántico del derivado sea más menor.

En conjunto, los resultados muestran que la direccionalidad en la conversión apenas puede determinarse según los criterios de Marchand (1964) vistos como un conjunto unitario de criterios, menos aun cuando se ejecuta según sentidos léxicos en lugar de por lexemas. La direccionalidad en la conversión sustantivo/verbo en inglés no puede identificarse de forma coherente mediante el conjunto de criterios, si se pretende una correspondencia perfecta entre criterios. El perfil más frecuente es aquel en el que algunos criterios señalan claramente un sentido, mientras que otros indican su contrario.

7.2.3 Implicaciones teóricas

En la literatura anterior, a veces se ha afirmado que la conversión es impredecible (en términos de bidireccionalidad o multidireccionalidad) por las dificultades que plantea, pero también se ha descrito como unidireccional. En esta tesis, se identifican varias tendencias para los pares de conversión:

i. En ocasiones, la relación entre pares de conversión es unidireccional, es decir, se puede encontrar una única dirección entre algunos pares: Así ocurre cuando los lexemas presentan un único sentido, o cuando sólo se convierte uno de los sentidos léxicos de un lexema.

ii. En otros pares, la direccionalidad es múltiple, y pueden encontrarse varias direcciones entre pares de lexemas, según los sentidos léxicos. Los resultados del análisis de sentidos léxicos de esta tesis demuestran que se pueden encontrar varias direcciones entre lexemas polisémicos. A diferencia de los enfoques que consideran la direccionalidad impredecible, esta tesis demuestra que, para la mayoría de los casos, se puede identificar una dirección entre sentidos, y que ésta se decide mejor según SD o SP.
iii. Los criterios probados en esta tesis no resultan aplicables para decidir la dirección entre algunos pares. Quizá los casos ambiguos, es decir, aquellos en los que ambas direcciones son posibles basándose en un análisis semántico, deban describirse como bidireccionales, con las implicaciones que esto puede tener para la descripción de la conversión en estudios relacionados, por ejemplo, para las relaciones semánticas entre pares de conversión.

7.3 LIMITACIONES Y FUTURAS LÍNEAS DE INVESTIGACIÓN

Esta tesis sólo trata las direcciones entre los sentidos léxicos identificados en el primer orden de derivación entre pares de conversión sustantivo/verbo. Queda para futuras investigaciones identificar:

i. si los criterios funcionan mejor para los pares de sentidos léxicos en el primer o en el segundo orden de derivación (como parece ser el caso en la afijación, véase Ruz & Cetnarowska 2023), y a un nivel más general,
ii. los patrones direccionales más frecuentes en la conversión, y
iii. la aplicabilidad de los criterios de direccionalidad por sentidos y los patrones cuando intervienen otras clases de palabras, por ejemplo, los adjetivos.

Otras limitaciones de esta tesis son principalmente metodológicas:

i. Esta tesis implica una gran cantidad de análisis manual, especialmente, en lo que se refiere a la clasificación de sentidos léxicos de las concordancias.
ii. Dado que todas las concordancias de los pares de lexemas de la muestra se clasificaron manualmente según los sentidos léxicos del OED, la muestra se limitó a los rangos de frecuencia 0 a 1.000. La muestra de esta tesis se considera representativa en el sentido de que también se

incluyen los lexemas polisémicos, pero una muestra de este tipo puede no ser representativa de todos los patrones direccionales o casos de conversión en inglés.

iii. Como en cualquier análisis semántico, se puede dar cierto grado de subjetividad, evitado en la medida de lo posible mediante un análisis según los sentidos léxicos del OED.

En cuanto a estas limitaciones, puede ser interesante explorar modelos de IA para automatizar la clasificación de sentidos léxicos para futuros trabajos, lo que puede ser útil para el estudio de lexemas de alta frecuencia de uso.

APPENDICES

Appendix A. Method: Pilot study

A.3.3 List of word-class changing affixes in Quirk et al. (1985), and in Stockwell & Minkova (2001) used as the basis for the extraction of derivatives by affixation in the study of the applicability of the directionality criteria in affixation

Quirk et al. (1985)		
C pref.		*a-*
		be-
		en-, *em-*
>N	Deverbal nouns: concrete	*-ant*
		-ee
		-er, *-or*
	Deverbal nouns: abstract	*-age*
		-al
		-ation
		-ing
		-ment
	Deadjectival nouns	*-ity*
		-ness
>N/Adj		*-ese*
		-(i)an
		-ist
		-ite

Stockwell & Minkova (2001)	
N/V>Adj	*-able*
	-al (*-ial*, *-ical*, *-ual*)
	-an, *-ian*
	-ary
	-ate
	-ese
	-esque
	-esc
	-full
	-iac
	-ic
	-ish
	-ive
	-less
	-ly
	-oid
	-ory

>Adj	N>Adj: native suff.	*-ed*
		-ful
		-ish
		-less
		-like
		-ly
		-y
	N>Adj: foreign suff.	*-al*, *-ial*
		-esque
		-ic
		-ous, *-ious*
	V>Adj	*-able*
		-ive
>Adv		*-ly*
		-ward(s)
		-wise
>V		*-ate*
		-en
		-ify, *-fy*
		-ize
		-ose
		-ous
		-some
		-y
>Agentive N		*-ant*, *-ent*
		-arian
		-ast
		-er
		-ist
		-ician
Stem>V		*-ate*
		-en
		-ify
		-ize
Misc.		*-arium*, *-orium*
		-ess
		-let

Appendix B. Method: Study on conversion

B.3.4.1 OED frequencies as verb and noun for the formally identical terms in our sample list. Homonymy is not represented

Sample from the BNC screened list (FREQ. 1–1,000) in alphabetical order					
Extracted from the list ordered by the noun frequency			Extracted from the list ordered by the verb frequency		
Pair	**N_FREQ**	**V_FREQ**	**Pair**	**N_FREQ**	**V_FREQ**
aggregate$^{N/V}$	510	199	*anagram*$^{N/V}$	51	1
arse$^{N/V}$	553	21	*baffle*$^{N/V}$	42	304
assart$^{N/V}$	17	2	*barter*$^{N/V}$	101	114
bale$^{N/V}$	264	94	*blank*$^{N/V}$	393	128
barrack$^{N/V}$	34	85	*blind*$^{N/V}$	628	488
bayonet$^{N/V}$	149	10	*blossom*$^{N/V}$	417	248
beep$^{N/V}$	125	37	*bluster*$^{N/V}$	32	65
belch$^{N/V}$	41	142	*bonk*$^{N/V}$	17	39
blab$^{N/V}$	2	14	*boomerang*$^{N/V}$	35	9
blather$^{N/V}$	6	10	*bray*$^{N/V}$	168	57
blazon$^{N/V}$	12	26	*brig*$^{N/V}$	94	2
bombard$^{N/V}$	57	210	*bristle*$^{N/V}$	156	209
botch$^{N/V}$	18	38	*burlesque*$^{N/V}$	28	4
bribe$^{N/V}$	312	274	*cartoon*$^{N/V}$	745	3
brood$^{N/V}$	234	206	*chalk*$^{N/V}$	916	107
chirp$^{N/V}$	20	47	*chaperon*$^{N/V}$	33	29
chirrup$^{N/V}$	9	20	*cheep*$^{N/V}$	21	8
cloister$^{N/V}$	187	9	*clamp*$^{N/V}$	235	524
coppice$^{N/V}$	67	34	*click*$^{N/V}$	445	763
cork$^{N/V}$	965	17	*clot*$^{N/V}$	109	99
crest$^{N/V}$	684	40	*crampon*$^{N/V}$	98	1
crimson$^{N/V}$	158	9	*crank*$^{N/V}$	140	79
crochet$^{N/V}$	56	37	*curtsy*$^{N/V}$	41	26
doom$^{N/V}$	392	520	*dapple*$^{N/V}$	4	38
doze$^{N/V}$	39	259	*dial*$^{N/V}$	301	538
dupe$^{N/V}$	71	104	*dragoon*$^{N/V}$	186	21

*dye*N/V	574	207	*dwarf*N/V	882	176
*excerpt*N/V	143	18	*dybbuk*N/V	40	9
*fathom*N/V	95	136	*flea*N/V	317	2
*fatigue*N/V	532	38	*floss*N/V	71	12
*fission*N/V	91	1	*flounder*N/V	111	159
*flounce*N/V	23	60	*fluff*N/V	103	73
*frisbee*N/V	27	1	*frizz*N/V	16	11
*garrison*N/V	594	37	*furl*N/V	2	36
*glissade*N/V	7	4	*fuss*N/V	775	258
*grub*N/V	224	51	*gorge*N/V	432	50
*hex*N/V	37	3	*graft*N/V	186	192
*holler*N/V	15	54	*hank*N/V	368	2
*hoover*N/V	272	101	*helm*N/V	279	11
*huddle*N/V	80	399	*hoax*N/V	156	17
*hug*N/V	253	770	*hymn*N/V	680	7
*jangle*N/V	33	111	*jab*N/V	123	228
*jog*N/V	61	467	*jaunt*N/V	92	5
*jolt*N/V	166	178	*jot*N/V	71	150
*jumble*N/V	350	122	*joust*N/V	21	32
*keek*N/V	4	5	*kerf*N/V	3	3
*lapse*N/V	367	373	*knob*N/V	427	4
*lesion*N/V	792	4	*latch*N/V	197	183
*levy*N/V	913	603	*leer*N/V	72	122
*libel*N/V	821	30	*mace*N/V	169	14
*lisp*N/V	52	24	*manacle*N/V	25	19
*louse*N/V	212	6	*mash*N /V	120	142
*nosh*N/V	22	6	*massacre*N/V	672	164
*pander*N/V	4	108	*nibble*N/V	66	244
*parody*N/V	289	103	*pillory*N/V	10	53
*paste*N/V	447	173	*piss*N/V	251	572
*pauper*N/V	219	1	*plague*N/V	548	372
*paw*N/V	351	91	*plume*N/V	297	13
*perfume*N/V	644	38	*ponce*N/V	58	10

picket[N/V]	430	152	*prostitute*[N/V]	695	24
pinion[N/V]	31	31	*puff*[N/V]	343	320
piston[N/V]	240	5	*quack*[N/V]	93	60
prick[N/V]	159	306	*queer*[N/V]	44	22
punt[N/V]	173	35	*reel*[N/V]	320	406
purl[N/V]	25	17	*retail*[N/V]	21	335
puzzle[N/V]	706	472	*reverence*[N/V]	254	8
rebuke[N/V]	135	212	*rot*[N/V]	309	433
rummage[N/V]	13	238	*scaffold*[N/V]	76	3
rustle[N/V]	122	227	*scar*[N/V]	718	266
saddle[N/V]	748	256	*scum*[N/V]	564	16
scoff[N/V]	12	182	*scythe*[N/V]	97	55
scowl[N/V]	113	306	*shark*[N/V]	546	5
serenade[N/V]	101	23	*shudder*[N/V]	219	693
shush[N/V]	1	23	*sire*[N/V]	136	76
skid[N/V]	110	213	*slaver*[N/V]	19	34
skive[N/V]	5	39	*sledge*[N/V]	204	27
skulk[N/V]	3	69	*sloosh*[N/V]	1	2
slack[N/V]	189	20	*slurp*[N/V]	31	48
sleet[N/V]	118	12	*snuff*[N/V]	101	134
slit[N/V]	409	178	*soak*[N/V]	63	921
slob[N/V]	65	4	*spasm*[N/V]	282	15
sludge[N/V]	201	21	*spire*[N/V]	420	9
smirk[N/V]	84	127	*squawk*[N/V]	39	105
snarl[N/V]	106	375	*stammer*[N/V]	55	172
sprain[N/V]	48	42	*stew*[N/V]	345	89
swipe[N/V]	79	59	*stilt*[N/V]	95	46
swoon[N/V]	28	58	*swerve*[N/V]	27	219
swot[N/V]	44	23	*tack*[N/V]	339	389
tattle[N/V]	10	4	*tar*[N/V]	211	85
thud[N/V]	195	157	*thwack*[N/V]	10	7
trash[N/V]	180	61	*torment*[N/V]	274	283
trumpet[N/V]	467	125	*torture*[N/V]	699	635

tup$^{N/V}$	10	4	*trammel*$^{N/V}$	4	11
umpire$^{N/V}$	491	21	*transect*$^{N/V}$	7	5
varnish$^{N/V}$	335	116	*trump*$^{N/V}$	225	70
vow$^{N/V}$	322	636	*tumble*$^{N/V}$	186	838
wax$^{N/V}$	623	209	*twit*$^{N/V}$	77	4
whap$^{N/V}$	1	1	*wanton*$^{N/V}$	8	1
whimper$^{N/V}$	74	174	*welsh*$^{N/V}$	189	6
witch$^{N/V}$	872	10	*whomp*$^{N/V}$	1	1
wuff$^{N/V}$	3	3	*whoop*$^{N/V}$	45	94
yawn$^{N/V}$	128	404	*wrangle*$^{N/V}$	107	23
Total	21,905	12,437	**Total**	21,575	14,244
Total	**70,161**				

B.3.4.2 OED raw frequencies as verb (V_FREQ) and noun (N_FREQ) for the pairs included in this thesis, with representation of homonymy, and after exclusion of mistakes, unrelated concordances, and reclassification of the concordances as their correct class category

An asterisk '*' following any of the pair's category information (N/V) in the column *Pair* indicates that no corresponding entry is found in the OED as the word class that precedes the asterisk but one is interpreted based on context analysis. The word-class category N/V is followed by a number when various entries are found in the OED, thus, the specific entries to which this analysis refers, and to which the concordances classified belong, are so specified. To avoid repetition and miscalculations, an asterisk in columns *N_FREQ* or *V_FREQ* is used when the frequency values for a specific lexeme are already provided in the previous row in the table. INT/S (in grey) refers to uses of the terms as interjections, representing sounds and are excluding from the total frequencies for the nouns and verbs.

Sample pairs after concordance recategorization and OED sense classification in alphabetical order			
Pair		**N_FREQ**	**V_FREQ**
1	*aggregate*$^{N/V}$	481	147
2	*anagram*$^{N/V}$	51	1
3	*arse*$^{N/V}$	473	15
4	*assart*$^{N/V}$	16	2
5	*baffle*$^{N/V}$	43	130
6	*bale*$^{N3/V2}$	194	18
7	*barrack*$^{N1/V1}$	78	2
8	*barter*$^{N/V}$	117	71
9	*bayonet*$^{N/V}$	145	11
10	*beep*$^{N/V}$	69	15
–	*beep*$^{INT/S}$	71	
11	*belch*$^{N/V}$	27	142
12	*blab*$^{N/V}$	2	11
13	*blank*$^{N/V}$	350	102
14	*blather*$^{N/V}$	6	9
15	*blazon*$^{N/V}$	12	21
16	*blind*$^{N/V}$	630	369
17	*blossom*$^{N/V}$	333	271
18	*bluster*$^{N/V}$	35	47

19	*bombard*$^{N/V}$	7	260
20	*bonk*$^{N/V}$	11	27
–	*bonk*$^{INT/S}$	7	
21	*boomerang*$^{N/V}$	21	6
22	*botch*$^{N2/V1}$	14	35
23	*bray*$^{N1/V1}$	12	46
24	*bribe*$^{N/V}$	325	256
25	*brig*$^{N1/V*}$	32	2
26	*bristle*$^{N/V}$	151	185
27	*brood*$^{N/V}$	249	188
28	*burlesque*$^{N/V}$	28	4
29	*cartoon*$^{N/V}$	742	2
30	*chalk*$^{N/V}$	826	108
31	*chaperon(e)*$^{N/V}$	63	30
32	*cheep*$^{N/V}$	19	7
33	*chirp*$^{N/V}$	19	43
34	*chirrup*$^{N/V}$	9	20
35	*clamp*$^{N1/V1}$	176	394
36	*clamp*$^{N3/V2}$	26	6
37	*click*$^{N1/V1}$	328	714
–	*click*^{INT}	61	
38	*cloister*$^{N/V}$	173	6
39	*clot*$^{N/V}$	127	37
40	*coppice*$^{N/V}$	56	8
41	*cork*$^{N/V}$	322	10
42	*crampon*$^{N/V}$	97	2
43	*crank*$^{N1/V1}$	51	70
44	*crank*$^{N2/V1}$	78	*
45	*crest*$^{N/V}$	592	21
46	*crimson*$^{N/V}$	65	5
47	*crochet*$^{N/V}$	60	22
48	*curtsy*$^{N/V}$	41	26
49	*dapple*$^{N/V}$	3	23

50	*dial*$^{N/V}$	269	510
51	*doom*$^{N/V}$	290	326
52	*doze*$^{N/V}$	36	260
53	*dragoon*$^{N/V}$	182	24
54	*dupe*$^{N1/V1}$	69	96
55	*dupe*$^{N2/V2}$	5	1
56	*dwarf*$^{N/V}$	632	163
57	*dybbuk*$^{N/V}$	46	3
58	*dye*$^{N/V}$	520	183
59	*excerpt*$^{N/V}$	151	10
60	*fathom*$^{N/V}$	94	137
61	*fatigue*$^{N/V}$	530	4
62	*fission*$^{N/V}$	91	1
63	*flea*$^{N/V}$	312	3
64	*floss*$^{N/V}$	50	6
65	*flounce*$^{N1/V1}$	3	57
66	*flounce*$^{N2/V2}$	21	1
67	*flounder*$^{N2/V}$	2	189
68	*fluff*$^{N1/V1}$	94	55
69	*frisbee*$^{N/V*}$	25	1
70	*frizz*$^{N/V}$	16	8
71	*furl*$^{N/V}$	1	8
72	*fuss*$^{N/V}$	782	234
73	*garrison*$^{N/V}$	600	23
74	*glissade*$^{N/V}$	7	3
75	*gorge*$^{N/V}$	384	74
76	*graft*$^{N1/V1}$	122	147
77	*graft*$^{N3/V2}$	11	1
78	*graft*$^{N4/V3(<TRANSF.\ V2)}$	52	9
79	*graft*$^{N5/V4}$	25	5
80	*grub*$^{N/V}$	193	53
81	*hank*$^{N/V}$	31	1
82	*helm*$^{N2/V2}$	179	8

83	*hex*$^{N1/V}$	12	1
84	*hoax*$^{N/V}$	164	5
85	*holler*$^{N/V}$	10	54
86	*hoover*$^{N/V}$	146	83
87	*huddle*$^{N/V}$	72	222
88	*hug*$^{N/V}$	243	752
89	*hymn*$^{N/V}$	677	8
90	*jab*$^{N/V}$	127	217
91	*jangle*$^{N/V}$	31	97
92	*jaunt*$^{N/V}$	96	1
93	*jog*$^{N1/V}$	80	381
94	*jolt*$^{N/V}$	163	170
95	*jot*$^{N/V}$	69	150
96	*joust*$^{N/V}$	21	16
97	*jumble*$^{N1/V}$	399	36
98	*keek*$^{N/V}$	1	4
99	*kerf*$^{N/V}$	3	2
100	*knob*$^{N/V}$	400	5
101	*lapse*$^{N/V}$	331	396
102	*latch*$^{N1/V1}$	200	141
103	*latch*$^{N1/V3}$	*	18
104	*leer*$^{N/V}$	53	112
105	*lesion*$^{N/V}$	790	2
106	*levy*$^{N1/V}$	675	604
107	*libel*$^{N/V}$	816	30
108	*lisp*$^{N/V}$	53	19
109	*louse*$^{N/V}$	205	7
110	*mace*$^{N5/V3}$	5	2
111	*manacle*$^{N/V}$	24	9
112	*mash*$^{N1/V1}$	122	95
113	*mash*$^{N2/V1}$	*	1
114	*massacre*$^{N/V}$	682	134
115	*nibble*$^{N/V}$	53	245

116	*nosh*$^{N/V}$	21	3
117	*pander*$^{N/V}$	4	106
118	*parody*$^{N/V}$	302	83
119	*paste*$^{N/V}$	439	152
120	*pauper*$^{N/V}$	191	1
121	*paw*$^{N/V}$	344	83
122	*perfume*$^{N/V}$	633	33
123	*picket*$^{N/V}$	421	93
124	*pillory*$^{N/V}$	10	53
125	*pinion*$^{N2/V}$	21	27
126	*piss*$^{N/V}$	238	550
127	*piston*$^{N/V}$	236	6
128	*plague*$^{N/V}$	516	347
129	*plume*$^{N/V}$	292	12
130	*ponce*$^{N/V}$	23	8
131	*prick*$^{N/V}$	164	273
132	*prostitute*$^{N/V}$	693	25
133	*puff*$^{N/V}$	296	279
–	*puff*$^{INT/S}$	17	
134	*punt*$^{N1/V2}$	96	22
135	*punt*$^{N4/V3}$	11	3
136	*punt*$^{N5/V1}$	18	8
137	*purl*$^{N1/V2}$	26	11
138	*puzzle*$^{N/V}$	704	321
139	*quack*$^{N2/V2}$	69	2
140	*quack*$^{N3/V1}$	35	33
–	*quack*^{INT}	10	
141	*rebuke*$^{N/V}$	136	205
142	*reel*$^{N1/V2}$	262	110
143	*reel*$^{N2/V1}$	6	265
144	*reel*$^{N3/V3}$	30	3
145	*retail*$^{N/V}$	34	220
146	*reverence*$^{N/V}$	245	14

147	*rot*$^{N/V}$	327	378
148	*rummage*$^{N/V}$	34	215
149	*rustle*$^{N/V}$	117	195
150	*saddle*$^{N/V}$	699	235
151	*scaffold*$^{N/V}$	72	1
152	*scar*$^{N2/V}$	594	145
153	*scoff*$^{N1/V1}$	3	149
154	*scoff*$^{N2/V2}$	1	37
155	*scowl*$^{N/V}$	113	293
156	*scum*$^{N/V}$	550	2
157	*scythe*$^{N/V}$	94	53
158	*serenade*$^{N/V}$	94	24
159	*shark*$^{N/V}$	512	2
160	*shudder*$^{N/V}$	215	654
161	*shush*$^{N/V}$	2	19
162	*sire*$^{N/V}$	125	71
163	*skid*$^{N/V}$	119	200
164	*skive*$^{N/V}$	2	38
165	*skulk*$^{N/V}$	1	68
166	*slack*$^{N3/V}$	92	22
167	*slaver*$^{N1/V}$	2	27
168	*sledge*$^{N1/V1}$	18	1
169	*sledge*$^{N2/V2}$	179	11
170	*sleet*$^{N/V}$	72	7
171	*slit*$^{N/V}$	372	110
172	*slob*$^{N/V}$	62	4
173	*sloosh*$^{N/V}$	1	2
174	*sludge*$^{N/V}$	216	5
175	*slurp*$^{N/V}$	22	48
–	*slurp*$^{INT/S}$	6	
176	*smirk*$^{N/V}$	82	127
177	*snarl*$^{N1/V1}$	12	17
178	*snarl*$^{N2/V2}$	90	352

179	*snuff*$^{N1/V1}$	15	102
180	*snuff*$^{N2/V2}$	2	12
181	*snuff*$^{N3/V2}$	93	*
182	*soak*$^{N/V}$	59	765
183	*spasm*$^{N/V}$	275	14
184	*spire*$^{N3/V3}$	8	1
185	*sprain*$^{N/V}$	49	31
186	*squawk*$^{N/V}$	38	95
187	*stammer*$^{N/V}$	49	167
188	*stew*$^{N2/V2}$	324	68
189	*stilt*$^{N/V}$	91	9
190	*swerve*$^{N/V}$	21	225
191	*swipe*$^{N/V}$	80	56
192	*swoon*$^{N/V}$	18	55
193	*swot*$^{N/V}$	34	17
194	*tack*$^{N1/V1}$	305	245
195	*tack*$^{N7/V5}$	84	9
196	*tar*$^{N/V}$	216	57
197	*tattle*$^{N/V}$	9	3
198	*thud*$^{N/V}$	191	152
199	*thwack*$^{N/V}$	9	4
–	*thwack*$^{INT/S}$	3	
200	*torment*$^{N/V}$	274	235
201	*torture*$^{N/V}$	799	490
202	*trammel*$^{N/V}$	3	7
203	*transect*$^{N/V}$	7	5
204	*trash*$^{N/V}$	195	35
205	*trump*$^{N2/V3}$	142	39
206	*trumpet*$^{N/V}$	473	89
207	*tumble*$^{N/V}$	190	798
208	*tup*$^{N/V}$	10	2
209	*twit*$^{N1/V}$	66	5
210	*umpire*$^{N/V}$	471	20

211	*varnish*$^{N/V}$	358	75
212	*vow*$^{N/V1}$	326	525
213	*vow*$^{N/V2}$	*	98
214	*wanton*$^{N/V2}$	7	1
215	*wax*$^{N1/V2}$	631	38
216	*wax*$^{N2/V1}$	7	91
217	*wax*$^{N3/V1}$	4	*
218	*welsh*$^{N/V}$	107	3
219	*whap*$^{N/V}$	1	1
220	*whimper*$^{N/V}$	72	165
221	*whomp*$^{N/V}$	1	1
222	*whoop*$^{N/V}$	31	90
–	*whoop*$^{INT/S}$	12	
223	*witch*$^{N/V}$	776	4
224	*wrangle*$^{N/V}$	108	19
225	*wuff*$^{N/V}$	1	2
–	*wuff*$^{INT/S}$	3	
226	*yawn*$^{N/V}$	134	387
Total number of concordances (excluding INT/S uses, in grey)		38,906	22,746
		61,652	

Appendix C. Sense classification of the concordances

C.3.4.3 Exemplification of concordances for each of the senses identified for the lexemes in the conversion sample

The Excel file containing Appendix C.3.4.3 can be accessed via the following link: https://tinyurl.com/ConcordanceSenseClassif

Appendix D. Analysis of the criteria for the conversion pairs

D.4.3.1 Analysis of the criterion of SD
D.4.3.2 Analysis of the criterion of SP
D.4.3.3 Analysis of the criterion of SR
D.4.3.4 Analysis of the criterion of RU
D.4.3.5 Analysis of the criterion of FO
D.4.3.6 Analysis of the criterion of RR

The Excel file containing the sheets corresponding to Appendices D.4.3.1–4.3.6 can be accessed via the following link: https://tinyurl.com/CriteriaAnalysis

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RESUMEN EXTENSO DE LA TESIS

(MENCIÓN INTERNACIONAL)

1 INTRODUCCIÓN

La direccionalidad de los procesos de formación de palabras sigue siendo un área controvertida y poco desarrollada, por ejemplo, en ámbitos como las paradojas de análisis en la derivación con afijos, la conversión y la retroformación, por citar las principales.

El concepto de *conversión* o *derivación cero* ha suscitado dudas desde su primer registro en las gramáticas inglesas del siglo XVIII (véase Sundby 1995: 36-37, 104, 107–108). Bajo el punto de vista de que hay una conexión derivacional entre los pares implicados en conversión, esta tesis aborda la cuestión de la direccionalidad, o qué lexema es base y cuál derivado en un par de lexemas parónimos. Tanto el carácter no resuelto de esta cuestión (cf. Bauer & Valera 2005: 11) como la renovada atención que ha recibido en los últimos años (véase, entre otros, Umbreit 2010; Bram 2011; Kopecka 2013; Kisselew et al. 2016; Lohmann 2017; Valera 2017, 2023; Tribout 2020; Iordăchioaia et al. 2020; Ševčíková 2021; Don 2023; también Ruz & Cetnarowska 2023, sobre la direccionalidad en afijación) ponen en primer plano la relevancia de la conversión como tema de investigación.

La direccionalidad en la conversión en inglés es un área donde se ha avanzado muy poco desde las publicaciones de Marchand (1963a, 1964), sobre todo en comparación con otras lenguas, donde las contribuciones más recientes han aportado avances significativos, especialmente en el checo (cf. Ševčíková 2021) y el neerlandés (cf. Don 1993, 2004). Quizá el mayor avance

experimentado en este tiempo sea de tipo metodológico, en concreto la hipótesis de que la direccionalidad sólo puede determinarse con precisión si se identifica según los sentidos léxicos de los lexemas, y no según los lexemas. Tal es el caso especialmente en conversión, donde la polisemia permite múltiples direcciones según cada uno de los sentidos léxicos (cf. Plank 2010).

La tesis parte de una prueba piloto sobre la validez de los criterios de Marchand de dependencia semántica, restricciones de uso, rango semántico y patrón semántico, así como la frecuencia y aparición en registros en la afijación explícita (Ruz & Cetnarowska 2023). A modo de patrón de comparación, en el que los criterios no resultan concluyentes en todos los casos aunque se apliquen a casos de afijación explícita, se examinan los mismos criterios en una muestra de pares de sustantivos/verbos relacionados por conversión en inglés. La tesis usa una muestra del *British National Corpus* (BNC), por lo que los resultados son pertinentes para el inglés actual. A diferencia de otras publicaciones sobre este tema (por ejemplo, Bram 2011), los criterios se investigan por sentidos léxicos en lugar de por lexemas siempre que sea posible, lo cual no es siempre el caso. Para que el análisis sea lo más objetivo posible, los sentidos léxicos se separan según recoge el *Oxford English Dictionary* (OED). Los resultados obtenidos se validan estadísticamente con la prueba estadística más adecuada en cada caso.

La hipótesis es que la direccionalidad en la conversión sigue siendo una cuestión difícil en parte por la dificultad inherente al proceso de conversión, pero en parte también por los criterios utilizados en la identificación de la direccionalidad y por la escala (lexema frente a sentido léxico) a la que se han aplicado estos criterios hasta ahora, por dos razones:

i. aunque la conversión se ha descrito a menudo por analogía con otros procesos de formación de palabras, principalmente con la afijación, es posible que no reaccione de forma similar a las pruebas de Marchand, y
ii. aunque a menudo se señala en la bibliografía que, en estudios anteriores, la semántica no ha recibido la importancia que merece, ninguna referencia ha aplicado la propuesta de Plank de que la direccionalidad debe estudiarse por sentidos léxicos y no por lexemas. Por lo tanto, se desconoce cómo la direccionalidad puede manifestarse según los criterios se apliquen a sentidos léxicos.

En definitiva, por tanto, esta tesis investiga criterios semánticos y cuantitativos-distribucionales para la identificación de la dirección en una muestra de nombres/verbos derivados por conversión en inglés contemporáneo, con el fin de elucidar:

i. la viabilidad de los criterios en el ámbito de los sentidos léxicos en lugar del de los lexemas (véase Plank 2010), y
ii. la idoneidad de los criterios de Marchand (1964) para su aplicación por sentidos léxicos.

2 CONVERSIÓN Y DIRECCIONALIDAD

Varias cuestiones rodean la descripción de la conversión en inglés, entre otras

i. qué término utilizar para referirse a la conversión,
ii. dónde incluirla en la descripción del inglés, y
iii. cómo indicar la direccionalidad.

Esta tesis aborda la conversión como un proceso dinámico o asimétrico que da lugar a la creación de nuevos lexemas (y de nuevos sentidos léxicos). Dado que los pares canónicos de conversión sustantivo/verbo son el objeto de esta tesis, se ha esbozado las condiciones para la conversión canónica tal y como se entiende en esta tesis: dos lexemas que pertenecen a dos clases de palabras diferentes, que son formalmente idénticos, morfológicamente relacionados, semánticamente relacionados, y entre los que hay una direccionalidad.

El capítulo de revisión se centra en la direccionalidad. Esta cuestión sigue sin resolverse en el inglés actual. El debate gira en torno a la necesidad de establecer la direccionalidad, a la que se dan distintos grados de importancia en la bibliografía:

i. la direccionalidad no tiene relevancia dentro de los enfoques que describen la conversión como multifuncionalidad o subespecificación, o también para los que afirman que la direccionalidad es irrelevante desde el punto de vista sincrónico,
ii. un análisis de la conversión como bidireccional o multidireccional reconoce la direccionalidad aunque afirma que es impredecible, y los autores que se centran en las irregularidades del léxico o en la polisemia implicada coinciden en que es difícil de determinar, y

iii. se permite la direccionalidad, especialmente dentro de los enfoques que consideran la conversión como un proceso de creación de lexemas, y se trata como algo secundario o como el principal objeto de estudio.

Este último punto es controvertido, en parte por las propiedades formales del proceso y también porque en la bibliografía se dan contradicciones sobre cómo decidir la direccionalidad. Diversos investigadores mencionan los siguientes criterios:

i. criterios históricos,
ii. criterios intuitivos,
iii. criterios morfológicos y fonológicos,
iv. criterios estructurales,
v. criterios contextuales o paradigmáticos,
vi. criterios semánticos, y
vii. criterios cuantitativos externos.

Estos criterios se utilizan en la bibliografía solos o conjuntamente para identificar la direccionalidad y resultan difíciles de aplicar, en parte porque los criterios sincrónicos y diacrónicos abordan fenómenos diferentes y también dan resultados diferentes, y en parte por el nivel de aplicación de los criterios, es decir, el nivel del lexema frente al de sentido léxico.

3 MÉTODO

Ésta es una tesis experimental que se basa en el uso de bases de datos para la identificación de la relevancia de criterios de direccionalidad descritos en la bibliografía especializada, y su aplicabilidad por sentidos léxicos.

El capítulo 3 resume el método utilizado, el cual combina el uso de datos de diccionario y de corpus, por lo que la sección 3.2 presenta en primer lugar los principales recursos utilizados, a saber:

i. *OED*, y
ii. *BNC*.

Esa sección describe cómo se utilizaron estos recursos, primero en un estudio piloto sobre la afijación, y posteriormente en la investigación principal sobre la direccionalidad en la conversión. La sección 3.3. se centra en el estudio piloto realizado con los objetivos de:

i. comprobar si los criterios semánticos de direccionalidad de Marchand (1964), junto con la distribución de frecuencias o registros, resultan aplicables en la afijación, y
ii. evaluar la aplicabilidad de los criterios en una escala de sentidos léxicos.

En concreto:
i. La sección 3.3.1 describe el método utilizado para la recogida de datos y la selección de una muestra de bases y sus derivados por afijación.
ii. La sección 3.3.2 describe cómo se llevó a cabo el análisis de los criterios de direccionalidad en la muestra de afijación.
iii. La sección 3.3.3 describe los principales resultados obtenidos del estudio piloto en cuanto a la aplicabilidad de los criterios en la afijación, y las implicaciones para el estudio de la direccionalidad en la conversión.

La descripción de la sección 3.4. es más extensa, ya que se centra en el estudio principal de la tesis. Esta sección describe el método para el estudio de la direccionalidad en una muestra de conversión sustantivo/verbo del inglés actual, en particular:
i. La sección 3.4.1 describe cómo se recopiló una lista de pares sustantivo/verbo formalmente idénticos a partir de la lista de frecuencias del BNC, y cómo se comprobó que los datos seleccionados no contenían errores.
ii. La sección 3.4.2 describe el muestreo de datos y la decisión de limitar la muestra a términos con una frecuencia igual o inferior a 1.000.
iii. La sección 3.4.3 describe las dificultades que surgieron durante la clasificación por sentido de las concordancias de la muestra, concretamente en relación con el uso de corpus (sección 3.4.3.1) y de información de diccionario (sección 3.4.3.2).
iv. La sección 3.4.4 describe las categorías semánticas utilizadas para clasificar los sentidos de la muestra de esta tesis, tanto para los sentidos derivados (3.4.4.1) como para los sentidos base (3.4.4.2).
v. La sección 3.4.5 describe y ejemplifica la aplicación de varios de los criterios de direccionalidad de Marchand (1964) a una muestra de conversiones sustantivo/verbo en inglés a nivel de sentido, a saber:
    1. SD (Sección 3.4.5.1),
    2. RU (Sección 3.4.5.2),
    3. SR (Sección 3.4.5.3),

4. SP (Sección 3.4.5.4),
5. FO (Sección 3.4.5.5), y
6. RR (Sección 3.4.5.6).

Aunque aquí no se tienen en cuenta criterios etimológicos (es decir, no se sigue el método basado en los registros más antiguos, véase también Bauer & Valera en prensa), los criterios semánticos son una parte esencial de la tesis y, en este sentido, ésta se basa en OED para una clasificación objetiva de los sentidos que pueden adoptar los lexemas. En caso necesario, se aplican procedimientos estadísticos al análisis de los datos.

4 RESULTADOS

El capítulo 4 presenta los principales resultados sobre la relevancia de los criterios de direccionalidad en una muestra de pares de conversión sustantivo/verbo del inglés actual.

En primer lugar, la sección 4.2 describe la distribución de los sentidos léxicos en órdenes de derivación y presenta la imagen resultante de dicha organización de sentidos, es decir, el número de sentidos léxicos identificados por órdenes de derivación.

La sección 4.3 se centra en los resultados de la aplicabilidad de los criterios de direccionalidad en una muestra de 226 pares relacionados con la conversión sustantivo/verbo en el primer orden de derivación, como se indica a continuación:

i. la sección 4.3.1 se centra en la aplicabilidad del criterio de dependencia semántica (DS),
ii. la sección 4.3.2 se centra en el patrón semántico (PS),
iii. la sección 4.3.4 se centra en el rango semántico (RS),
iv. la sección 4.3.3 se centra en restricciones de uso (RU),
v. la sección 4.3.5 se centra en la aplicabilidad del criterio de gama de registros (RR) mediante dos clasificaciones de registros, y
vi. la sección 4.3.6 se centra en la frecuencia de aparición (FO).

La sección 4.4 presenta los resultados de la coherencia entre la dirección indicada a través de los criterios probados en esta tesis por sentidos léxicos (para los criterios de SR, FO, y RR, independientemente del grado de

confianza con el que los criterios identifican una dirección). Los resultados de la coherencia entre criterios se presentan del siguiente modo:

i. La sección 4.4.1 se centra en la coherencia entre SD y SP.
ii. La sección 4.4.2 se centra en la coherencia entre SD y SR.
iii. La sección 4.4.3 se centra en la coherencia entre SD y RU.
iv. La sección 4.4.4 se centra en la coherencia entre SD y FO.
v. La sección 4.4.5 se centra en la coherencia entre SD y RR.
vi. La sección 4.4.6 se centra en la coherencia entre SP y SR.
vii. La sección 4.4.7 se centra en la coherencia entre SP y RU.
viii. La sección 4.4.8 se centra en la coherencia entre SP y FO.
ix. La sección 4.4.9 se centra en la coherencia entre SP y RR.
x. La sección 4.4.10 se centra en la coherencia entre SR y RU.
xi. La sección 4.4.11 se centra en la coherencia entre SR y FO.
xii. La sección 4.4.12 se centra en la coherencia entre SR y RR.
xiii. La sección 4.4.13 se centra en la coherencia entre RU y FO.
xiv. La sección 4.4.14 se centra en la coherencia entre RU y RR
xv. La sección 4.4.15 se centra en la coherencia entre FO y RR.

5 ANÁLISIS

El análisis del capítulo 5 comienza con algunas observaciones generales. En concreto, la sección 5.2.1 analiza cómo las decisiones metodológicas adoptadas pueden afectar al análisis de la direccionalidad, entre otras:

i. las fuentes seleccionadas,
ii. el nivel de análisis, es decir, lexema frente a sentido léxico, y
iii. un análisis de los sentidos en uso frente a otro que incluya todos los sentidos léxicos, incluidos los que ya no se utilizan.

La sección 5.2.2 justifica que la distribución de los sentidos léxicos en órdenes de derivación es la mejor opción para comprobar la direccionalidad por sentidos léxicos, aunque pueda introducir cierto sesgo. A continuación, la sección 5.2.3 analiza que el grado de aplicación de los criterios a nivel de sentido es bastante dispar, siendo los criterios más aplicables SD y SD, seguidos de FO. Independientemente de si la direccionalidad predicha por estos criterios es coherente o no, la aplicabilidad de estos tres criterios es superior al 75%. En cambio, SR, RR, y RU presentan baja aplicabilidad, todos ellos por debajo del 55%.

La sección 5.3 analiza los resultados entre criterios, con especial atención a cómo puede variar su coherencia en función de la interpretación estricta de los criterios. Esta sección muestra que la coherencia entre algunos de los criterios es baja, como cabría esperar porque algunos de los criterios no muestran alta aplicabilidad. Y lo que es más importante, se muestra que, por ejemplo, si una dirección sólo se interpreta cuando se demuestra estadísticamente que existe una diferencia significativa entre la frecuencia de aparición de los sentidos, la aplicabilidad de los criterios disminuye.

La forma de interpretar los criterios puede dar lugar a resultados diferentes, especialmente en lo que se refiere a FO y RR en esta tesis. En este sentido, el establecimiento de niveles de significación se considera necesario para una correcta interpretación de los criterios.

La sección 5.4 examina y ejemplifica cuestiones relativas a la pertinencia de los criterios. SD y SP parecen dar los mejores resultados en un análisis de direccionalidad por sentidos léxicos, sin embargo, los criterios no carecen de problemas. Se hace hincapié en las siguientes cuestiones:

i. Es necesario redefinir los criterios o, al menos, definir claramente si se adopta una interpretación restrictiva o inclusiva de un criterio, por ejemplo, si SD sólo se aplica cuando el sentido homólogo se menciona en la definición de un sentido, o si se aplica también a los sentidos definidos a partir de sinónimos (o también mediante sentidos paralelos por afijación) (véase la sección 5.5.1).
ii. Las decisiones lexicográficas pueden afectar al análisis morfológico. Se trata de una cuestión metodológica importante, aunque se identifique en pocos casos (véase el ejemplo de *anagram*$^{N/V}$ en la sección 5.5.2).
iii. Se interpreta SR como un criterio que se aplica mejor por lexemas, aunque tenga en cuenta los sentidos léxicos. Sin embargo, SR no permite un análisis de la direccionalidad por sentidos específicos y, por tanto, la identificación de direcciones múltiples. Además, se demuestra que la aplicabilidad del criterio es cuestionable (véase 5.5.3), ya que se argumenta que una gama semántica más amplia no apunta necesariamente a una derivación coherente. Esto concuerda con afirmaciones anteriores de que la dirección no puede establecerse únicamente sobre la base del crecimiento léxico (cf. Umbreit 2010).
iv. Se destaca que RU es un criterio secundario y aplicable a casos muy concretos y sólo por sentidos léxicos.

v. Se argumenta que los criterios distribucionales (FO y RR) pueden no ser tan fiables para el estudio de la direccionalidad en la conversión como se pensaba. Aunque pueden servir para estudiar el uso actual de los sentidos dentro de pares de lexemas, e incluso si tienden a señalar una dirección correcta para una serie de sentidos, su papel en la direccionalidad es secundario, y sus resultados deben considerarse siempre junto a los criterios semánticos, que resultan más relevantes.

Por último, la sección 5.5.6 argumenta que la identificación de la derivación recursiva en la conversión como en órdenes de derivación subsiguientes es un método eficaz para el estudio de la direccionalidad en la conversión entre pares polisémicos. En definitiva, la propuesta de esta tesis sigue a Plank (2010) en cuanto a que la direccionalidad es una propiedad de los sentidos léxicos entre lexemas y debe estudiarse por sentidos léxicos.

6 CONCLUSIONES

Esta tesis muestra cómo las decisiones metodológicas pueden afectar al análisis de la direccionalidad. No sólo el uso de criterios de diversa naturaleza arroja diferentes resultados (véase la sección 2.5 para una revisión de los criterios propuestos en la bibliografía especializada), sino que otros aspectos metodológicos pueden repercutir en las conclusiones sobre la direccionalidad entre pares de conversión sustantivo/verbo en inglés, entre otros:

i. las fuentes usadas para analizar los criterios (lexicográficas y de corpus),
ii. el nivel de análisis, es decir, lexema frente a sentido léxico, y
iii. un análisis de los sentidos léxicos en uso frente a otro que incluya todos los sentidos, también los que están desuso.

Esta tesis también muestra cómo difieren los resultados según la interpretación de los criterios. Esto hace necesaria una descripción más precisa de los criterios cuando se aplican a la conversión, pero también a otros ámbitos, así como la necesidad de establecer niveles de significación cuando se estudian criterios cuantitativo-distribucionales.

Los estudios previos sobre direccionalidad comparaban los resultados de los criterios semánticos o distribucionales con los de otros criterios. Dado que el enfoque de esta tesis es sincrónico y se centra en las direcciones que se pueden identificar en la conversión según las relaciones de

sentidos léxicos entre pares relacionados por conversión en inglés actual, esta tesis sólo pone a prueba criterios semánticos y distribucionales (cf. Marchand 1964). En este sentido, se esperaba una mayor coherencia entre los resultados de los criterios probados en esta tesis. Sin embargo, los resultados no fueron los esperados:

i. queda en evidencia una baja aplicabilidad de algunos de los criterios (SR, RR y RU) por diversas razones y, en consecuencia, también una baja coherencia entre éstos y otros criterios, y
ii. aunque los criterios se centran en el uso de los pares sincrónicamente, los resultados entre los criterios se orientan en algunos casos en sentidos opuestos, lo que arroja dudas sobre la aplicabilidad de los criterios.

En mayor detalle, la tesis demuestra que:

i. SD y SP ofrecen los mejores resultados en un análisis de la direccionalidad basado en sentidos léxicos, aunque su aplicabilidad presenta problemas y los resultados no siempre son concluyentes (tampoco en la afijación explícita).
ii. Los criterios distribucionales (FO y RR) pueden no ser tan fiables para el estudio de la direccionalidad en la conversión como se pensaba. Aunque FO o RR pueden dar cuenta del uso actual de los sentidos dentro de pares de lexemas, e incluso si tienden a señalar una dirección para una serie de sentidos léxicos, las conclusiones según estos criterios no siempre son coherentes.
iii. Se cuestiona la aplicabilidad de SR, en parte porque se aplica mejor por lexemas, y en parte porque un rango semántico más amplio no apunta necesariamente a una dirección derivacional coherente, incluso entre pares monosémicos.
iv. RU destaca como un criterio secundario, aplicable a casos muy concretos, y sólo para los sentidos léxicos, no para lexemas.

Finalmente, si se trata de responder a los objetivos iniciales, esta tesis demuestra que:

i. Se puede aplicar los criterios por sentidos léxicos, y los resultados así obtenidos se aproximan sin duda a cómo puede haber operado el proceso derivativo en cada caso. Sin embargo, la aplicabilidad de los criterios difiere, y algunos de ellos sólo son de aplicación en casos concretos (por ejemplo, RU).

ii. La pertinencia de los criterios cuando se aplican por sentidos léxicos también varía y, mientras que SD o SP parecen ofrecer los mejores resultados, se presentan casos complejos en la aplicación de otros criterios.

En conjunto, los resultados muestran que la direccionalidad en la conversión apenas puede determinarse según los criterios de Marchand (1964), al menos no si se les considera un conjunto unitario de criterios, menos aun cuando se aplica dichos criterios por sentidos léxicos en lugar de por lexemas. Aunque los resultados obtenidos mediante este procedimiento sin duda se acercan más a cómo puede haber operado el proceso derivativo en cada caso, lo cierto es que la direccionalidad en la conversión sustantivo/verbo en inglés no puede identificarse de forma coherente mediante el conjunto de criterios, si lo que se pretende es un resultado coherente entre los criterios. En su lugar, el perfil más frecuente es aquel en el que algunos criterios señalan claramente un sentido, mientras que otros señalan la contraria.

Queda para futuras investigaciones identificar:

i. si los criterios funcionan mejor para los pares de sentidos léxicos en el primer o en el segundo orden de derivación (como parece ser el caso en la afijación, véase Ruz & Cetnarowska 2023), y a un nivel más general,
ii. los patrones direccionales más frecuentes en la conversión, y
iii. la aplicabilidad de los criterios de direccionalidad por sentidos y los patrones cuando intervienen otras clases de palabras, por ejemplo, los adjetivos.