

Lexis

Journal in English Lexicology

HS 3 | 2024

The Impact of Multilingualism on the Vocabulary and Stylistics of Medieval English

Trends in the development of vocabulary for EMOTION and COGNITION in English: A millennial perspective

Kateryna Krykoniuk and Sara M. Pons-Sanz



Electronic version

URL: <https://journals.openedition.org/lexis/8437>

ISSN: 1951-6215

Publisher

Université Jean Moulin - Lyon 3

Electronic reference

Kateryna Krykoniuk and Sara M. Pons-Sanz, "Trends in the development of vocabulary for EMOTION and COGNITION in English: A millennial perspective", *Lexis* [Online], HS 3 | 2024, Online since 17 October 2024, connection on 17 October 2024. URL: <http://journals.openedition.org/lexis/8437>

This text was automatically generated on October 17, 2024.



The text only may be used under licence CC BY-SA 4.0. All other elements (illustrations, imported files) are "All rights reserved", unless otherwise stated.

Trends in the development of vocabulary for EMOTION and COGNITION in English: A millennial perspective

Kateryna Krykoniuk and Sara M. Pons-Sanz

1. Introduction

- 1 While the significant role that language contact can play in language change had not received much scholarly attention before the publication of Weinreich's 1953 foundational monograph, many key findings in the last fifty years have enabled us to improve our understanding of this area of historical linguistics in general, and the history of the English language in particular. We know, for instance, that, while a language might borrow virtually anything from another (i.e., "lexical items, morphemes, morphological rules, phonemes, phonological rules, collocations and idioms, and morphosyntactic processes", in Hock's [1991: 384] words), there are scales of borrowability: e.g., in terms of word classes, lexical terms tend to be borrowed more easily than grammatical / function terms and, amongst the former, nouns are borrowed most easily (see, e.g., Lass [1997: 90]; Winford [2003: 51]; Haspelmath & Taylor [2010: 231]; and Matras [2011]). Similarly, there is much disparity in the amount of lexical transfer that we find in the expression of different meanings, with "core vocabulary" being much less receptive to borrowing than technical / specialized vocabulary.
- 2 Recent empirical work has enabled us to add further detail to this general trend. For instance, Matras [2009: 169] refers to the existence of a "proximity constraint", which posits that there is "greater stability of concepts pertaining to the immediate surroundings: orientation in space, time and quantity, the private domain of mental and physical activity, and the nearest human environment (body and close kin).

Concepts that involve negotiation of activity with others are [e.g., WARFARE, POLITICAL RELATIONS], by contrast, more prone to borrowing”.

- 3 The extensive work led by Martin Haspelmath and Uri Tadmor as part of the Loanword Typology Project to explore the amount of borrowing that we find across different semantic fields has provided even more fine-grained details (Haspelmath & Tadmor [2009a]; for an overview of the findings, see Haspelmath & Taylor [2010]; the results are publicly accessible through the *World loanword database, WOLD*: Haspelmath & Tadmor [2009c]). By analysing the amount of borrowing in twenty-two semantic fields of forty-one languages across the world, they have been able not only to establish how receptive different languages are to lexical borrowing (English features in the top 5; Haspelmath & Taylor [2010: 230]) but also to provide more detailed insights. Importantly for the present study, their work suggests notable differences regarding the amount of borrowing associated with two semantic fields referring to one’s mental world, or “private domain of mental [...] activity” in Matras’s words: EMOTIONS AND VALUES (field no. 16), and COGNITION (field no. 17). The terms referring to COGNITION in the database appear right at the centre of a cline of borrowability (eleventh out of the twenty-two semantic fields, with loanwords accounting for 24.2% of vocabulary), whereas terms for EMOTIONS AND VALUES exhibit lower rates of borrowability (this semantic field takes the sixteenth place, with 19.9% of terms being loanwords; Haspelmath & Taylor [2010: 232-233]).
- 4 The fact that the field of EMOTIONS AND VALUES scores lower is interesting – perhaps even surprising – because Weinreich [1953: 58] identifies affective language as an “onomastic low-pressure area”, i.e., a domain where there is constant demand for (near-)synonyms as a result of the fact that these terms tend to “lose their expressive force” rather quickly. This claim is supported by Sylvester & Tiddeman’s [this volume] findings, as ANGER is the only affective semantic field in their Middle English corpus but the most heavily lexicalized of the ten fields they study (cf. also the historical growth of the field discussed by Diller [2014: 113-117]). The disparity between the two semantic fields becomes even more notable when their make-up is taken into consideration: eighteen nouns, fourteen adjectives and sixteen verbs (forty-eight meanings in total) in the field of EMOTIONS AND VALUES vs. ten nouns, eleven adjectives, fifteen verbs and fifteen function words in the COGNITION field (fifty-one meanings in total). Given the aforementioned differences in levels of borrowability across the various word classes, this distribution should, in principle, facilitate a higher rate of borrowing in the expression of EMOTIONS AND VALUES.
- 5 Part of the explanation for this unexpected finding might have to do with the meanings that are included in each of the fields, as Haspelmath & Tadmor [2009b: 6] admit that their distribution is “somewhat arbitrary”, to the extent that they point out, for instance, that “‘clever’ is in field 16 (*Emotions and values*) but could equally fit into field 17 (*Cognition*)”. Because of the behaviour of affective vocabulary as explained out by Weinreich, bringing together terms referring to EMOTIONS and VALUES might have also affected the results. We also need to bear in mind that the project aimed to take a snapshot of contemporary vocabulary and, accordingly (and understandably, given the size of their corpus and the variety of languages involved in terms of extant historical records), diachronic changes in borrowing patterns were not explored in detail. Moreover, it is important to remember that the data in that cross-linguistic study are based on the intuitions of the expert working on each language regarding the term(s)

in that particular language that best fit(s) the given meaning, a process that is complicated by the fact that “complete identity of meaning rarely occurs within a single language, let alone across languages” (Haspelmath & Tadmor [2009b: 9]). In fact, Grant [2009: 372] reports different results for English: 51.7% of the terms referring to the senses included in the EMOTIONS AND VALUES semantic field have a foreign root vs. 47.2% in the COGNITION field.

- 6 Grant’s [2009: 372] data also include important differences in connection with the origin of the loanwords in the two fields: while in both of them French-derived terms account for the majority of the loanwords, there are remarkable differences in connection with the impact of Latin (1.7% for EMOTIONS AND VALUES vs. 15.1% for COGNITION) and Old Norse (8.6% for EMOTIONS AND VALUES vs. 1.9% for COGNITION). These figures provide a useful general context for our work and, as well as a point of comparison with recent work on the etymological make-up of the semantic field of EMOTION during the Middle English period, where the important presence of French- and Norse-derived vocabulary has already been noted (e.g., Skaffari [2009: 146-162]; Pons-Sanz [2015], [2022] and [Forthc.c]; Sylvester & Tiddeman [this volume]). The semantic field of COGNITION has also received some etymological attention (e.g., Ingham [2017]), but the focus has been the study of the semantic and stylistic interaction between (near-)synonyms rather than etymological explorations of the field (e.g., Koivisto-Alanko [1997], [1999]; Molencki [2018]; and Pons-Sanz [Forthc.a]; cf. Kiricsi [2010]). In this respect, the differences regarding the way in which other languages have influenced the two semantic fields still requires careful consideration. This is also the case because most of the recent studies aiming to provide an etymological account of the terms associated with specific semantic fields in medieval English have focused on technical vocabulary and areas of activity that are fairly far from of the “private domain of mental [...] activity”: e.g., in a number of projects, Louise Sylvester, Richard Ingham and their collaborators have paid close attention to the interaction between native terms and loans referring to the seven domains of everyday life represented in the *Bilingual Thesaurus of Everyday Life in Medieval England* (BUILDING, DOMESTIC ACTIVITIES, FARMING, FOOD PREPARATION, MANUFACTURE, TRADE, TRAVEL BY WATER), together with HUNTING, MEDICINE and ANGER (e.g., Sylvester & Marcus [2007]; Sylvester, Tiddeman & Ingham [2020] and [2022]; Sylvester and Tiddeman [this volume]). Olga Timofeeva and Annina Seiler have recently received funding from the Swiss National Science Foundation to work on the etymology of Middle English terms referring to RELIGION, MEDICINE, EDUCATION, and LAW as part of the project “Waxing and waning words: Lexical variation and change in Middle English” (cf. Timofeeva [2018]). Mambelli & Vogelsanger [this volume] bring into dialogue their doctoral work on the etymological make-up of the Middle English vocabulary for THE MANOR and THE CHURCH, respectively (Vogelsanger [2023]; Mambelli [2024]).
- 7 Given the significance of the research and the need to minimize the impact of various issues that could have affected the reliability of previous studies, the present article aims to provide a comprehensive account of the semantic and etymological (source languages and word-formation processes) make-up of the lexis for COGNITION (represented by terms referring to MENTAL CAPACITY) and EMOTION in the English language as a whole, and in the Middle English period in particular, to explore lexical development in these fields, with particular attention to the impact of multilingualism. The structure of the rest of the article is as follows. In Section 2, we explain our dataset

and methodology. Section 3 presents the overall results of our analyses and identifies the main features of the vocabulary for COGNITION and EMOTION in the history of English in terms of semantics, source languages, and word-formation processes; the section concludes with an overall Principal Component Analysis model, where these various aspects are brought together. This provides the context for Section 4, where we present a similar approach for the Middle English period. Section 5 outlines our conclusions. The appendix at the end of the paper provides additional graphs for various aspects of our dataset.

2. Data and methodology

- 8 In this section, we present our dataset, describe the features according to which we have labelled it and introduce the quantitative methods we have used for its analysis.

2.1. Dataset

- 9 So as to make our data manageable and yet as comprehensive as possible, and to take into account possible imbalances in the word classes that make up the vocabulary of the semantic fields and the impact that differing rates of borrowability across those classes might have in facilitating / hindering borrowing, our dataset comprises only the nouns attested throughout the history of the English language (from the Old English period up to 2023) which the *Historical Thesaurus of English (HTE)* lists for two semantic fields included under 02 THE MIND: MENTAL CAPACITY (02.01), as this is the semantic field which includes the terms commonly associated with the fundamental cognitive processes through which the human mind acquires and processes information (e.g., INTELLECT, 02.01.02; CONSCIOUSNESS, 02.01.03; THOUGHT, 02.01.06; PERCEPTION / COGNITION, 02.01.07, etc.); and EMOTION (02.04). There are, however, some exceptions: the terms associated with PSYCHOLOGY (02.01.05) and PHILOSOPHY (02.01.15) are not included because they refer in the main to different branches / schools of psychological or philosophical enquiry across history and, accordingly, they are technical terms associated with specific areas of knowledge / activity (along the lines of terms referring to MEDICINE, LAW, etc.) rather than mental processes *per se*.
- 10 This process of data collection rendered 707 nouns associated with MENTAL CAPACITY (with the aforementioned exclusions) and 1250 associated with EMOTION. In order to ensure a fair comparison between the two lexicons, we standardized their sizes by reducing the EMOTION lexicon to match the size of the COGNITION lexicon¹. As a result, both sub-samples comprise 707 nouns. We consider these sub-samples to be approximate representations of the COGNITION and EMOTION lexicons in English, although this does not mean that English speakers shared the same semantic conceptualization at all points in the history of the language. After all, *HTE* imposes a modern understanding of these concepts (e.g. medieval speakers spoke about passions rather than emotions, as the latter term did not acquire its modern meaning until the Early Modern English period; Diller [2014: 370-391]).
- 11 In any case, relying on the taxonomy put forward by *HTE* helped us to reduce the level of arbitrariness in our classification (although, ultimately, all classifications are, to a greater or lesser extent, arbitrary; cf. Fischer [2004] and Molina [2008]) and, given that

this resource is a well-established tool in historical lexicology, to facilitate comparability across studies (e.g. Mambelli and Vogelsanger [this volume] focus on the field that *HTE* calls FAITH, 03.08, for their analysis of terms referring to THE CHURCH; cf. as well Fincher [2024: Chapter 1] and Pons-Sanz [Forthc.a and Forthc.b: Chapter 3]).

2.2. Labelling of the data

- 12 With the help of Bosworth-Toller's *Anglo-Saxon dictionary online*, the *Oxford English dictionary (OED)*, and *HTE*, all the nouns in our sample were labelled for the following categories:

(1) Year of first attestation (as given in *HTE*): this category provides an approximate temporal framework for when the word was integrated into the language. While the category is useful, it presents certain challenges not only because the date of first attestation might differ significantly from the date of coinage / introduction into the language but also because, as far as medieval texts are concerned, there is often an important difference between the date of composition of a text and the date of the manuscript(s) where it is recorded. Practices in the key lexicographic tools differ in this respect. *MED* cites two dates: the suggested date of the earliest manuscript, which is given primacy for dating purposes; and the suggested date of composition of the text. *OED*'s current (third) edition has adopted this practice, but previous editions refer to the known or presumed date of composition of the text (Durkin [2014: 228]). As *HTE* is the main source of our dataset, we have adopted whichever date is provided there for each term.

(2) Year of last attestation (as given in *HTE*): words still in use were marked as "2023", the year when we started this study.

(3) Period of the first attestation of a noun: tags and cut-off points are as follows: "OE" (= Old English; up to 1149), "ME" (= Middle English; 1150-1499), "EModE" (= Early Modern English; 1500-1749), "LModE" (= Late Modern English; 1750-1899) and "PDE" (= Present-Day English; 1900-2023). This is the information that is represented in the various charts below, as all of them, unless otherwise stated, refer to nouns first attested during a given period; only Figures 9 (b), 10 (b) and 13 refer to nouns *in use* in the Early and Late Middle English period (on the timespan of these periods, see below, Section 4.1.), regardless of their first attestation.

(4) Band frequency: this information derives from the eight-band logarithmic scale of frequencies that *OED* assigns to each term for the period 1500-2010.

(5) Word formation process in English: i.e., how a word was formed *in English*. For the labelling of the morphological structure of words, we relied on formal-morphological analysis, which offers accurate, concise and consistent solutions for the morphological description of languages (Krykoniuk [2022]). It involves distinguishing the elements of a lexeme and assigning them to a particular morphological category (Tyshchenko [2003]). The roots are encoded with the word class they belong to, and affixes are encoded in the way they are written in a language (e.g. *happiness* is labelled with the following formula: "Aj+ness"). By this token, each word in the sample was converted into a morphological pattern on the basis of the morphological description provided by *OED*.

We adopted a morpheme-based perspective on roots. As a result, a root in a word can refer both to the morpheme within a word that carries the main semantic meaning and to the monomorphemic word that functions as an independent syntactic unit. Further, the decision on whether the root / word was monomorphemic was made on the basis of whether it was formed on

native grounds (i.e., using English word-formation processes). Because they cannot be taken as signs of productivity in English, words borrowed as a whole from other languages were considered monomorphemic, even if they were originally formed through derivation or other processes in the source language.

In addition to derivation (prefixation and suffixation), we distinguished between the following word-formation processes: compounding (e.g. *bad blood*), conversion (a.k.a. zero-derivation; e.g. the noun *disvalue* was formed in the early seventeenth century by conversion from the homonymous verb; *OED* [s.v. *disvalue*, n.]); alternation of another lexical item (e.g., the obsolete noun *apprension* was coined in the sixteenth century on the basis *apprehension*, a noun borrowed directly from Latin or through French during the Middle English period; *OED* [s.vv. *apprension* and *apprehension*]); and nouns formed from idiomatic phrases (e.g., *nearest and dearest*; *OED* [s.v. *near*, adj. and n., sense 8.b]).

(6) Language of origin of the root: we documented the direct source language of each root as an individual variable. However, establishing the etymology of roots proved particularly difficult in connection with the differentiation between French and Latin (= French / Latin; cf. Durkin [2014: 236-240 and 245-249]). The etymological information was primarily sourced from *OED*.

(7) Semantic classification of the term: this refers to the subfield (only the first level within MENTAL CAPACITY (OR EMOTION) where the noun is listed in *HTE*.

2.3. Analytical tools

- 13 To analyse our sample, we relied on different methods. Trends of interest were visualized using bar plots and stacked bar plots. Further, the comparison of frequencies between groups of interest was performed with the help of the Kruskal-Wallis test, followed by post-hoc analysis with Dunn's test. Finally, we used Principal Component Analysis (PCA) to identify the most distinct trends and associations within our sample², as well as Correspondence Analysis (CA) to trace the associations between features of interest and language periods³.

3. General features of the nouns referring to COGNITION and EMOTION in English

- 14 This section deals with the semantic and etymological (source language and word-formation processes) features of the nouns referring to COGNITION and EMOTION throughout the history of English, obtained from various quantitative and statistical analyses. We first describe the overall development of the fields of COGNITION and EMOTION across time in Section 3.1., with particular attention to the development of their various subfields. Section 3.2. then looks at the languages of origin of the roots of nouns referring to these (sub)fields and how patterns have changed over time. Finally, Section 3.3. explores the English word-formation processes involved in the development of nouns referring to the two fields.

3.1. Lexical development across time: Semantic subfields

15 *HTE* includes a number of useful visualizations where users can see at a glance the chronological development of a semantic field. Our labelling scheme makes it possible for us to provide complementary charts across various encoded features which, albeit more limited in scope because of our focus on nouns, help us to gain further understanding of lexical development across the history of the English language in general, and the medieval period in particular. For example, *HTE*'s lexicalization sparklines do not include the Old English period because of the impossibility of narrowing attestations down to specific decades (an issue very problematic as well for the Middle English period; cf. above, Section 2.1.). Similarly, the heatmaps do not consider the Old English and most of the Middle English period (they take into account attestations from 1470s). However, these two periods (particularly Middle English) made a very significant contribution to the development of the lexis for *COGNITION* and *EMOTION* throughout the history of English (see Figure 1 (a)) and, more specifically, in connection with today's vocabulary (see Figure 1 (b)). The comparison of these bar plots seems to suggest that a larger amount of *EMOTION* terms which originated in Old English have become obsolete, as compared to those in the *COGNITION* lexicon (cf. the significant contribution of the Middle English period to the lexicalization of particular emotions; see also Figure I in the appendix).

Figure 1 (a). Period of first attestation of nouns referring to *COGNITION* and *EMOTION* in the whole sample

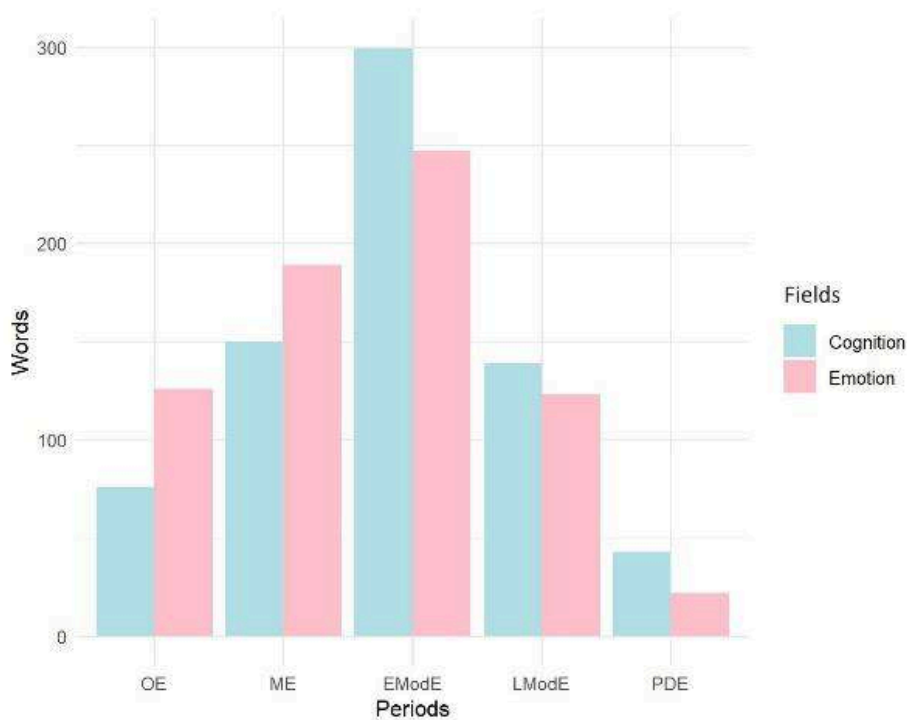
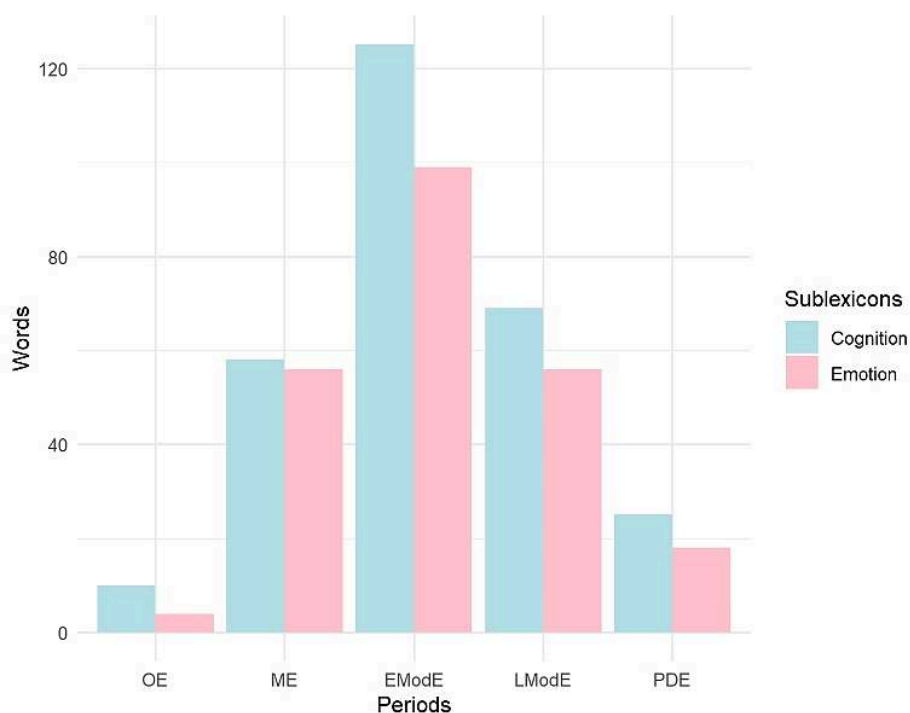


Figure 1 (b). Period of first attestation of nouns referring to COGNITION and EMOTION in the active lexicon of the sample (i.e., terms still in use)



- 16 As one might expect and as the visualizations on *HTE*'s website make clear, the vocabulary referring to the two semantic fields and their various subfields did not develop at the same pace and, accordingly, a more fine-grained approach to the data is necessary in order to understand such internal developments. The Correspondence Analysis (CA) plots presented in Figure 2 are helpful in this regard by offering a comprehensive overview of the associations between the various language periods and the subfields most closely associated with them. They visually capture how different observations (i.e., rows; the observations are the semantic subfields, shown by navy-coloured circles), relate to each other and to different groups of observations, represented by columns (these are the language periods, shown as pink triangles). The closer the distance between data points, the greater the association between them, which, for our purposes, indicates that a period is particularly significant for the lexicalization of a specific concept.
- 17 The plots show that, as far as COGNITION is concerned (Figure 2 (a)), the Old English period is largely associated with KNOWLEDGE, the Middle English period with MEMORY, the Early Modern English period with the more general concepts that *HTE* associates with MENTAL CAPACITY itself and EXPECTATION, the Late Modern English period with PERCEPTION / COGNITION and INTELLIGIBILITY, and the Present-Day English period with INTELLECT. In addition, the greater number of semantic subfields (i.e., LACK OF UNDERSTANDING, EXPECTATION, MENTAL CAPACITY, DISPOSITION / CHARACTER, UNDERSTANDING, THOUGHT, BELIEF and PERCEPTION / COGNITION) clustered around the Old, Early Modern and Late Modern English periods indicates a more significant contribution of these periods to these semantic fields. In general, the first two dimensions in the CA analysis of the

COGNITION subfields (Figure 2 (a)) account for almost 87% of the variation in the dataset, which reflects the robustness of the aforementioned associations⁴.

- 18 The following association patterns are observed for the EMOTION semantic field (Figure 2 (b)): PRIDE is more prominently associated with the Old English period; FEAR, COMPASSION, PLEASURE and SUFFERING have a stronger link to the Middle English period; and PATIENCE, VIOLENT EMOTION, PASSION and CALMNESS are more closely tied to the Early Modern English period. Further, we observe a more significant association of COURAGE with Late Modern English, and EXCITEMENT with Present-Day English. Finally, LOVE and ZEAL / ENTHUSIASM are located approximately at the centre of the plot, emerging as important subfields for all language periods. Similar to the COGNITION semantic field, the first two dimensions of the CA model for the emotion subfields explain up to 87% of the variability⁵.
- 19 Both CA plots show that the Present-Day English period is distinctly separated from others, which indicates that this period has made a less significant contribution overall to the expression of COGNITION and EMOTION. For our purposes, another notable trend stands out: the Middle English period plays a significant role in a range of various subfields within the EMOTION field, whereas its role is less important for the field of COGNITION.
- 20 In summary, while the Old and Middle English periods had a significant role in lexicalizing concepts associated with basic cognition (i.e., UNDERSTANDING, MEMORY and KNOWLEDGE), they contributed much less towards the lexicalization of other concepts, e.g., those associated with INTELLIGIBILITY, whose expression was in the main shaped in post-medieval times. Similarly, the speakers of Old and Middle English seem to have been particularly preoccupied with the expression of largely negative emotions (e.g., SUFFERING, ANGER, and FEAR), to the extent that the terms that we still use to refer to some of them were pretty much established by the end of the Middle English period (e.g., HATRED and HUMILITY), while other emotions (e.g., INDIFFERENCE) do not seem to have been lexicalized much in the Middle Ages.

Figure 2 (a). Correspondence Analysis plots showing the association of the semantic subfields and language periods: COGNITION

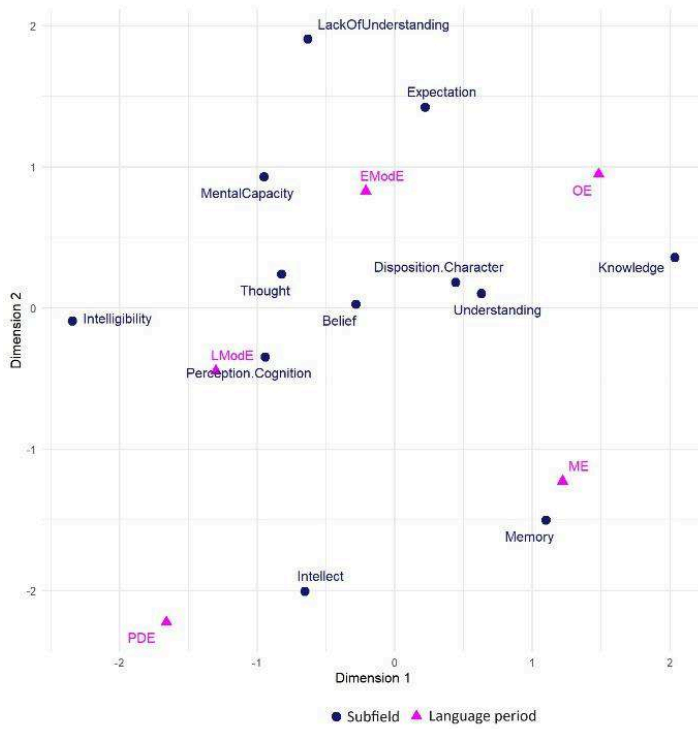
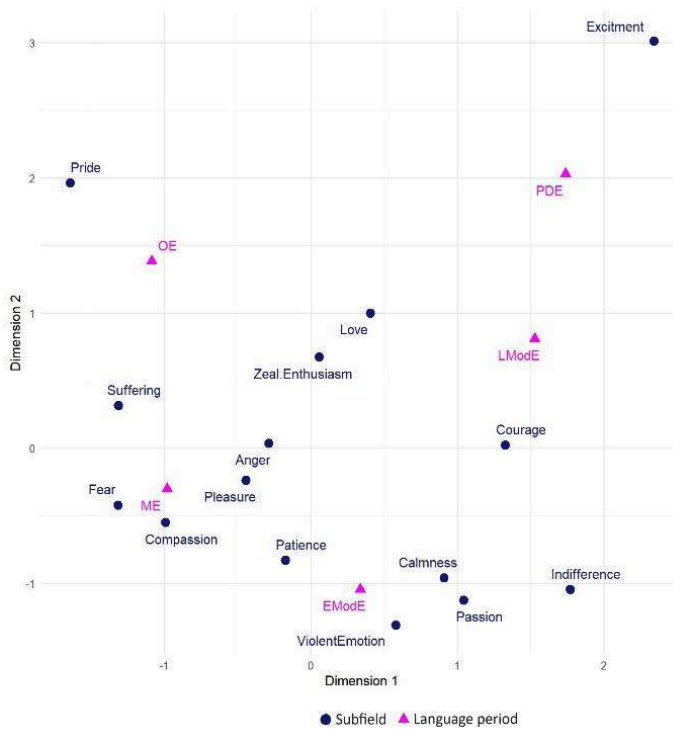


Figure 2 (b). Correspondence Analysis plots showing the association of the semantic subfields and language periods: EMOTION



3.2. Etymological make-up of the English nouns referring to COGNITION and EMOTION: Source languages

- 21 A comparison of the COGNITION and EMOTION lexicons in terms of their borrowability indicates that the former has greater receptiveness for lexical borrowings: 69.87% of the nouns referring to COGNITION in our dataset have a borrowed root, while the equivalent percentage for the EMOTION lexicon is 59.43%. This trend is also observed when we focus only on monomorphemic terms and terms that have been borrowed as a whole, i.e. terms that have not participated in word-formation processes in English: foreign influence accounts for 31.54% of the COGNITION lexicon and 25.39% of the EMOTION lexicon. Albeit fairly higher than the figures reported by the Loanword Typology Project (probably, at least to some extent, because we are only dealing with nouns in this study), our percentages are in keeping with the overall results reported in the project regarding the higher borrowability of the COGNITION field across the various languages in their corpus; as such, they show a different picture from the results reported specifically for English (Grant [2009]).
- 22 The plots in Figure 3 show the percentual contribution of languages (y-axis) to each language period (x-axis) in the whole (a), and active (b) COGNITION sample. The trends in both samples exhibit a comparable trajectory: a decline in prominence of English roots up to the Early Modern English period, followed by a modest increase in their usage towards the Present-Day English period. The contribution of French / Latin is relatively stable from Middle English through to Present-Day English. As expected, the influx of French words began during the Middle English period, reached its peak in the Early Modern English period and subsequently experienced a gradual decline (cf. Durkin [2014: 33]). Further, we see the introduction of a small number of words with an Old Norse (= Sc[andinavian]) root during the Middle and Early Modern English periods; we also start to see the influence of Greek during the latter period. Other languages also contributed to the COGNITION lexicon, but many of the terms became obsolete. They include words from various languages such as Italian (e.g., *scope*), Spanish / Latin (e.g., *machina*), Arabic (e.g., *Rosetta stone*) and words of unknown origin (e.g., *schooning*).

Figure 3 (a). Root etymology of nouns referring to COGNITION across the language periods in the whole sample

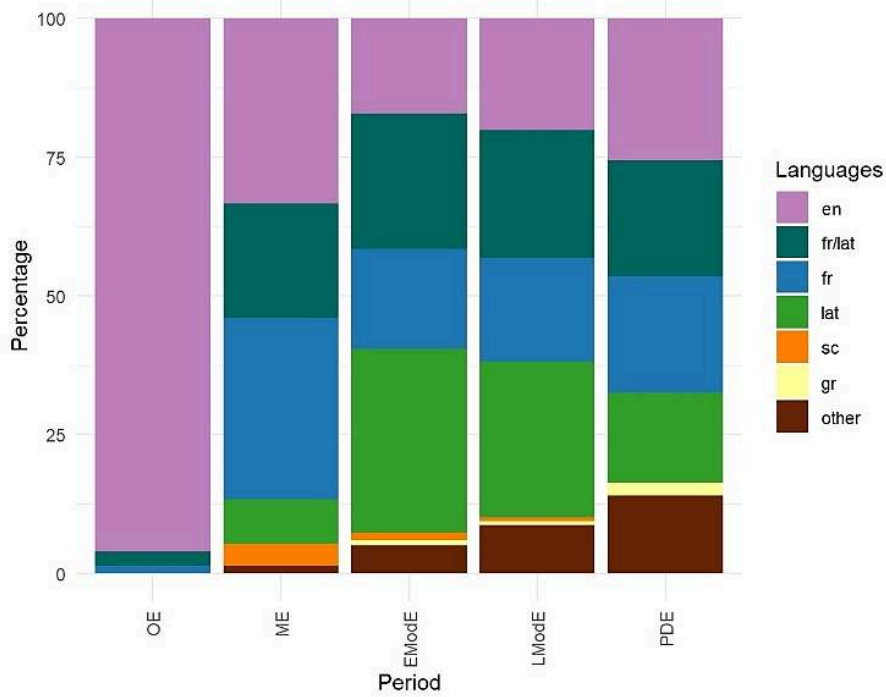
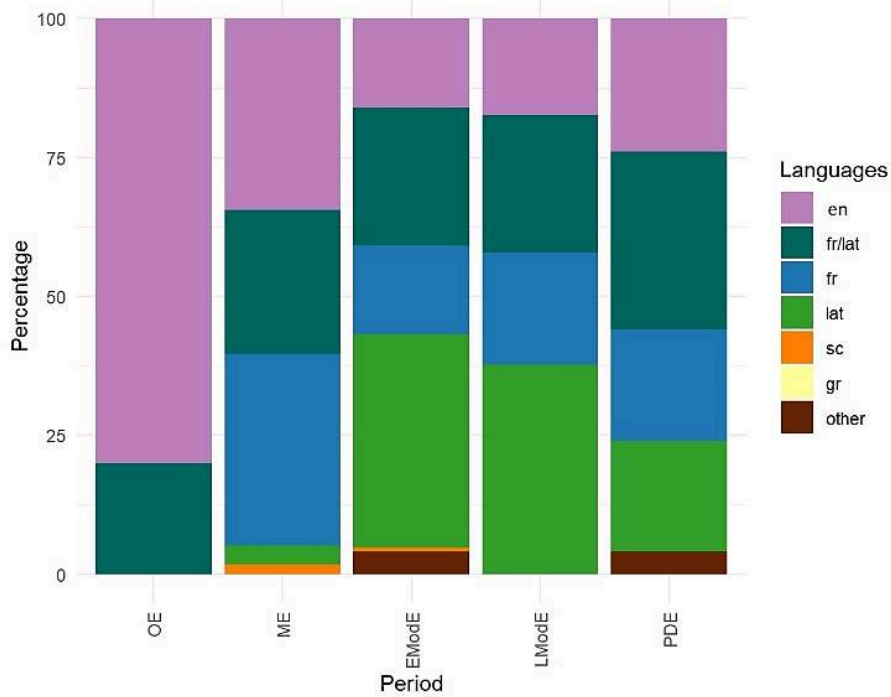


Figure 3 (b). Root etymology of nouns referring to COGNITION across the language periods in the active lexicon of the sample



- 23 In terms of the EMOTION lexicon (see Figure 4), while the contribution of English and French is largely comparable to that observed in the COGNITION lexicon, the role of Old Norse and Greek appears slightly more prominent. As one might expect, the latter is particularly present in post-medieval times (cf. Durkin [2014: 375-378]), while Norse-derived terms are mainly associated with the Middle English period, although the dataset does include some post-medieval terms: in the main, terms based on words already attested in medieval times (e.g. the compound *wet leg* is a twentieth-century coinage, but *leg* is first attested ca. 1300; OED [s.vv. *leg*, n., and *wet leg*]). In addition, languages other than English, French, Latin, Greek and Old Norse show a greater contribution to the EMOTION field in general, with many words remaining in the active lexicon. These include words of unknown origin (14 in total, e.g., *gale*) and borrowings from Italian (e.g., *fortissimo*) or an undetermined Romance language (e.g., *sensation*; cf. Durkin [2014: 372-375]).

Figure 4 (a). Root etymology of nouns referring to EMOTION across the language periods in the whole sample

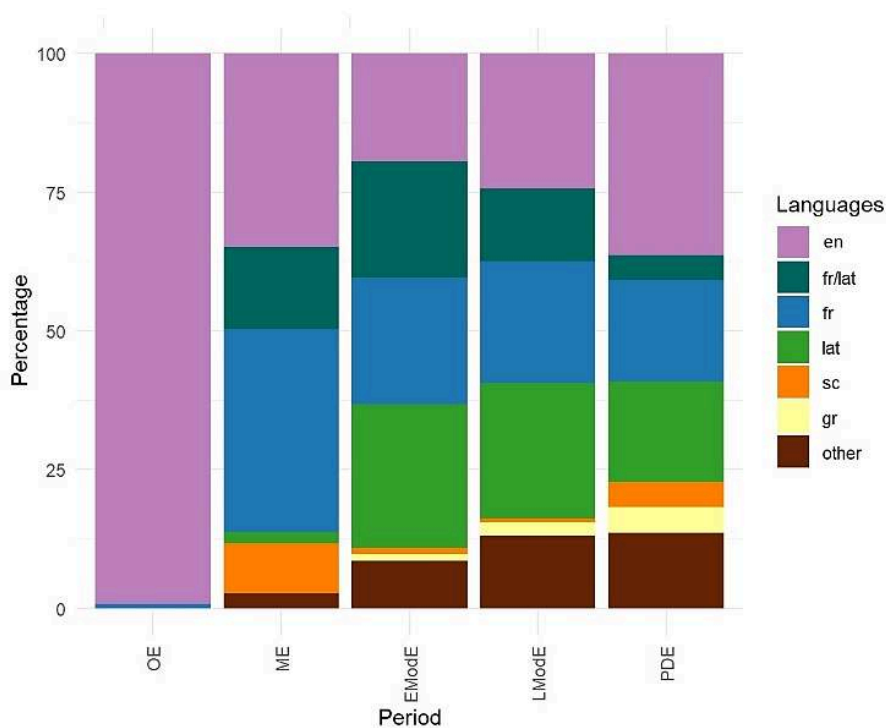
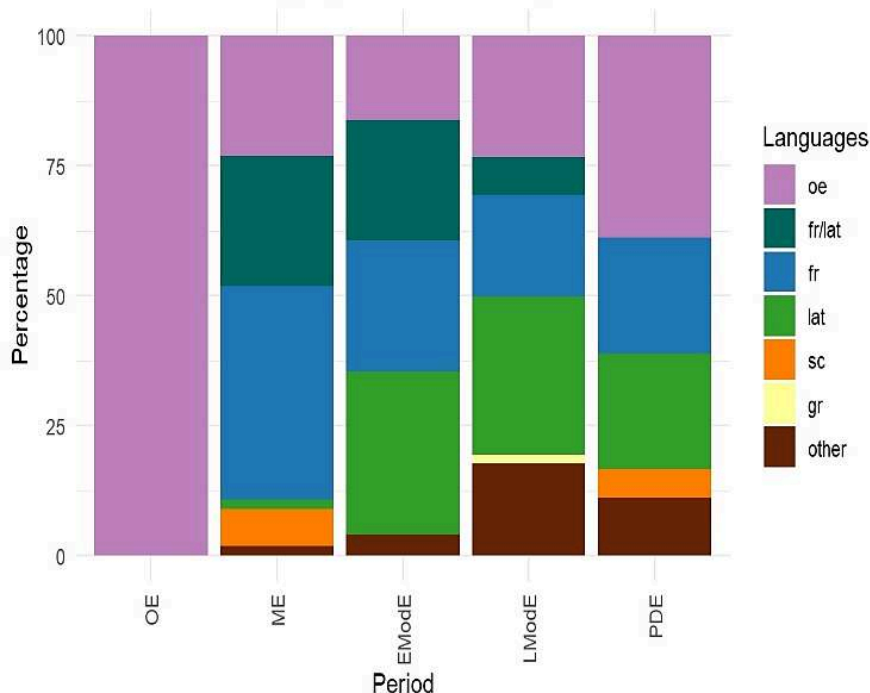


Figure 4 (b). Root etymology of nouns referring to EMOTION across the language periods in the active lexicon of the sample



- 24 Overall, the trends that we observe in our dataset are in keeping with those reported by Grant [2009; see above, Section 1] for the terms referring to EMOTIONS AND VALUES and COGNITION as part of the Loanword Typology Project. This refers not only to the different presence of Norse-derived terms in the two lexicons, but also to nouns with a Latin root, even if the difference is not as great as that reported by Grant: in the active lexicon, approx. 28% of the COGNITION nouns and approx. 22% of the EMOTION nouns clearly derive from Latin (i.e., they are labelled as “Latin”, not “French / Latin”), while approx. 0.5% and 1% of the COGNITION and EMOTION nouns, respectively, derive from Old Norse.
- 25 The CA plots in Figure 5 illustrate the main trends for the semantic subfields and the languages that contributed to them. In the COGNITION field, the first two dimensions account for nearly 70% of the variability, while in the EMOTION field, the first two dimensions explain 69.4% of the variability⁶. English shows stronger associations with the COGNITION subfields of SPIRITUALITY, THOUGHT, KNOWLEDGE and MORAL EVIL; and with the EMOTION subfields of INTENSE EMOTION, PRIDE, FEAR, COURAGE, HATRED, JEALOUSY / ENVY, PLEASURE, SUFFERING and ANGER. French demonstrates closer ties to the COGNITION subfields of EXPECTATION, UNDERSTANDING, BELIEF, DISPOSITION / CHARACTER and INTELLECT; and to the EMOTION subfields of LOVE, FURIOUS ANGER, VIOLENT EMOTION and COMPASSION. Latin contributes the most to the COGNITION subfields of PERCEPTION / COGNITION, HARM / DETRIMENT, INTELLIGIBILITY and LACK OF UNDERSTANDING; and to the EMOTION subfields of PATIENCE, CALMNESS, and EXCITEMENT. The impact of French / Latin is observed mainly in the COGNITION subfields of MEMORY and MENTAL CAPACITY; and the EMOTION subfields of PASSION, INDIFFERENCE and ABSENCE OF EMOTION. Finally, the contribution of Old Norse is prominent in the reference to the more general concepts associated with MENTAL

CAPACITY and in the EMOTION subfield of HUMILITY. The latter can be explained to a large extent because of the high number of members of the *meek* word-field from the Early Middle English period onwards: they account for five of the fourteen Norse-derived nouns in our EMOTION dataset: *meekhead*, *meekness*, *meeklaik*, *meekship* and *mekelac*; cf. Pons-Sanz [2015: 581-583]). The contribution of Greek is particularly associated with the COGNITION subfield of CONSCIOUSNESS and the EMOTION subfield of EXCITEMENT.

Figure 5 (a). The Correspondence Analysis plots for the distribution of different languages across the various semantic subfields: COGNITION

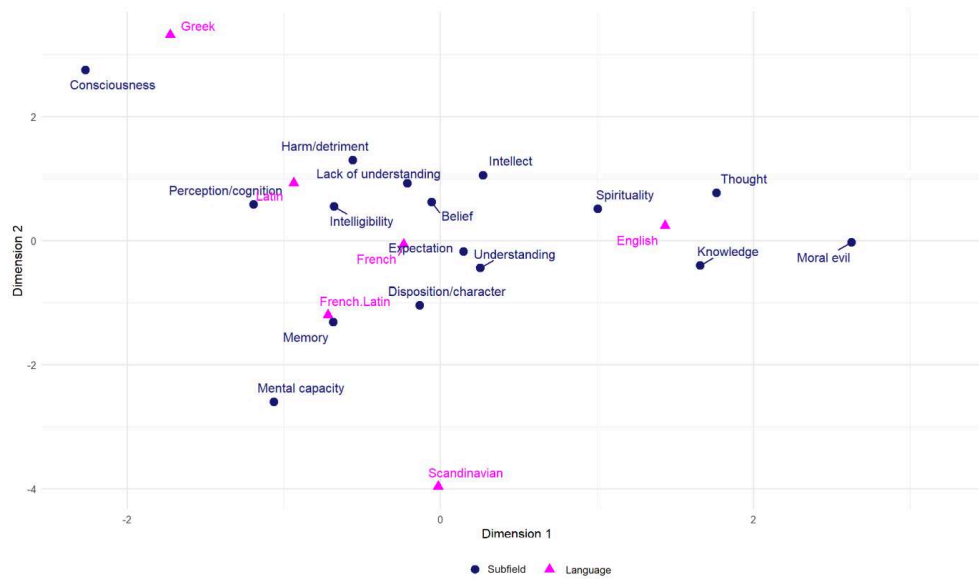
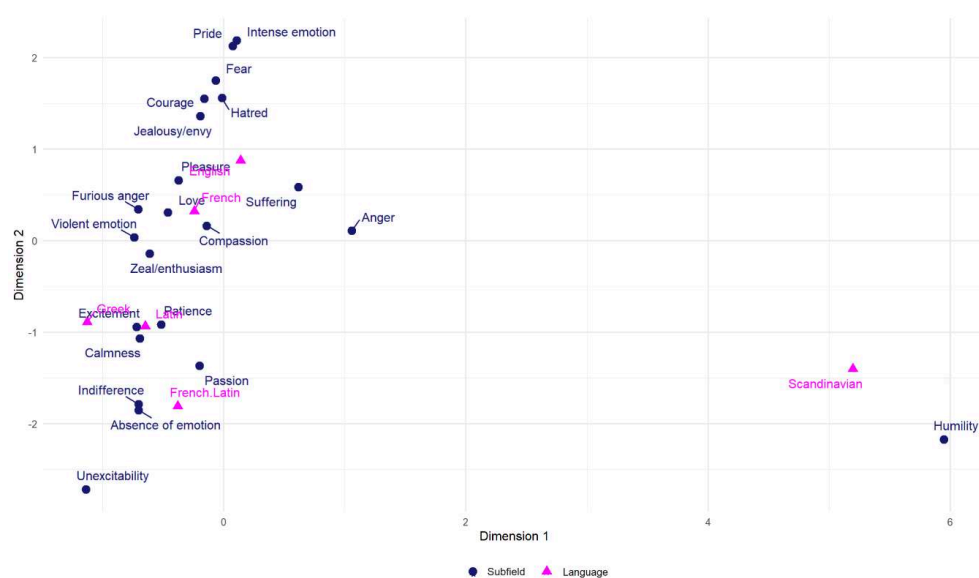


Figure 5 (b). The Correspondence Analysis plots for the distribution of different languages across the various semantic subfields: EMOTION



- 26 Moreover, to determine if there is a statistical difference in the contributions of native and borrowed roots across various semantic subfields, we performed a chi-square test. With respect to each lexicon, the test revealed a statistically significant difference in

the contribution of native and borrowed roots to the semantic subfields in the COGNITION and EMOTION lexicons (for COGNITION: $X^2=66.55$, $df=16$, $p < 0.001$; for EMOTION: $X^2=62.753$, $df=21$, $p < 0.001$). More detailed analysis of these differences (illustrated by the residual plots in Figure II in the appendix) highlights specific semantic subfields that are more strongly associated with borrowed vocabulary versus those more closely linked to native roots. In the COGNITION lexicon, we observe an influx of terms with a foreign root in the following semantic subfields: PERCEPTION / COGNITION, MEMORY, MENTAL CAPACITY and CONSCIOUSNESS. On the other hand, the subfields thriving on the basis of native roots include the following: KNOWLEDGE, THOUGHT, THE MIND, MORAL EVIL, INTELLECT and SPIRITUALITY. In the EMOTION lexicon, borrowed roots have a more prominent representation in the expression of CALMNESS, VIOLENT EMOTION, EXCITEMENT, HUMILITY, INDIFFERENCE, PASSION, PATIENCE and UNEXCITABILITY. In contrast, native roots show a greater involvement in the expression of PRIDE, SUFFERING, LOVE, INTENSE EMOTION, FEAR, HATRED, ANGER, COURAGE and JEALOUSY / ENVY, i.e., the prototypical emotions⁷. A more detailed picture of the contribution of each language to various semantic subfields is provided by the stacked plots in Figure III in the appendix.

3.3. Etymological make-up of the English nouns referring to COGNITION and EMOTION: Word-formation processes

- ²⁷ The CA plots in Figure 6 ((a) and (b)) allow us to determine the associations between the word-formation processes and the language periods. These CA models are notably robust, with the first two dimensions explaining 71.5% and 87.7% of the variability in the COGNITION and EMOTION lexicons, respectively⁸. There are some shared trends across both lexicons: in terms of word-formation patterns, the role of simplexes is important during Middle English and Early Modern English, while Present-Day English is more strongly associated with compounding. As far as derivation is concerned, we also see associations between particular suffixes and periods: Middle English is largely linked to the morphological pattern {R+ing}; Late Modern English to {R+ment}; and {R+er} and {R+ /ance/} (the suffix represents *-ance*, *-ancy*, *-ence* and *-ency*) were particularly productive in Early and Late Modern English. There are, however, also important differences regarding word-formation processes: for the COGNITION nouns they follow a time-related progression from Middle to Present-Day English (along the first dimension), while those for the EMOTION terms only from Middle to Late Modern English (along the second dimension). This suggests that, in the COGNITION lexicon, each period shows a greater association with certain word-formation processes. In contrast, in the EMOTION lexicon, the clustering of periods implies that word-formation processes are more consistent across different periods, reflecting less temporal variation and more stable word-formation trends. Regarding specific suffixes, during Present-Day English, *-ation* is more significant for the expression of COGNITION and *-ness* for the expression of EMOTION. A more detailed visualization of these trends is provided in the stacked bar plots in Figure IV in the appendix.

Figure 6 (a). Correspondence Analysis plots showing associations between language periods and word-formation processes: COGNITION

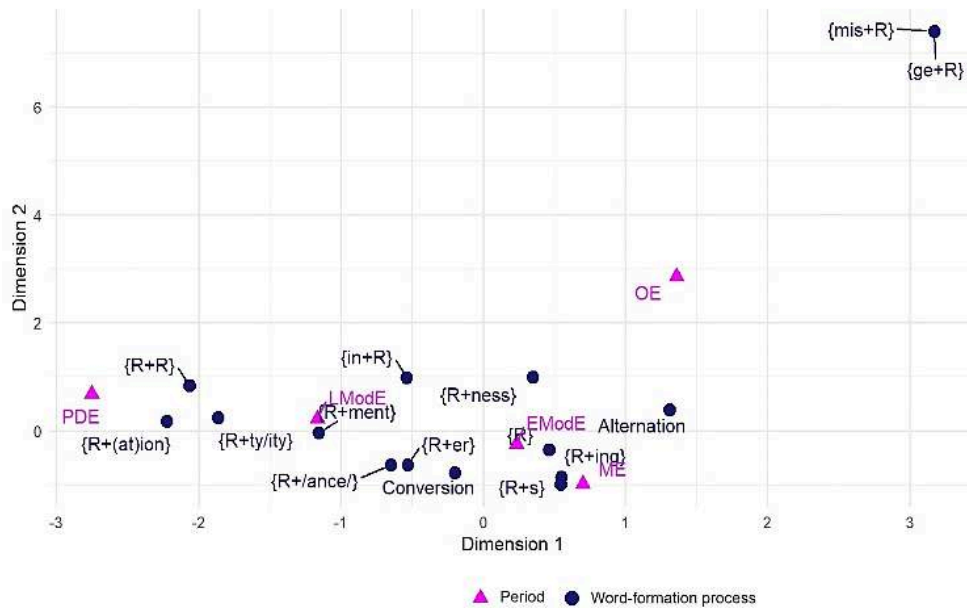
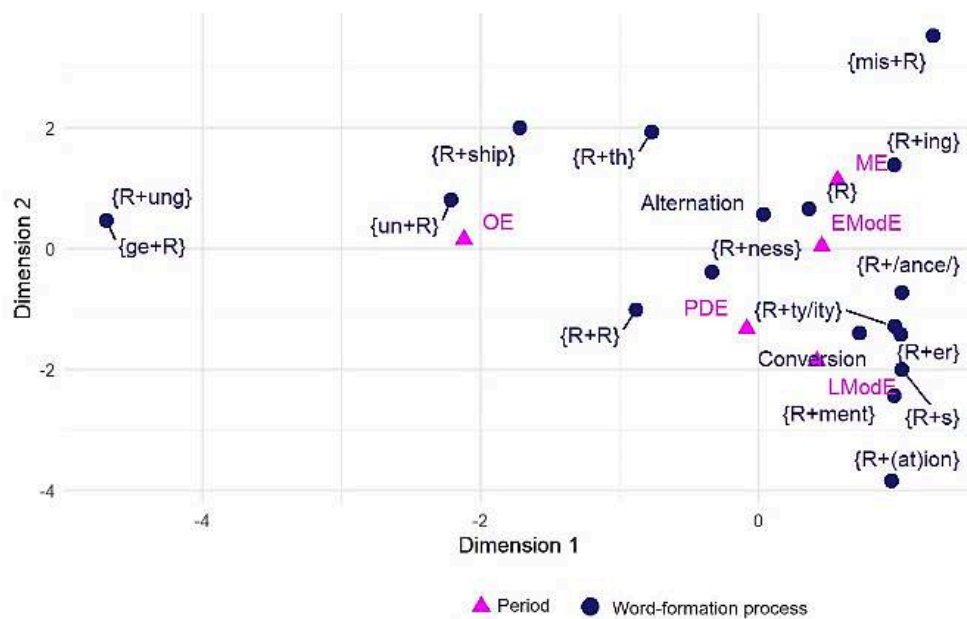


Figure 6 (b). Correspondence Analysis plots showing associations between language periods and word-formation processes: EMOTION



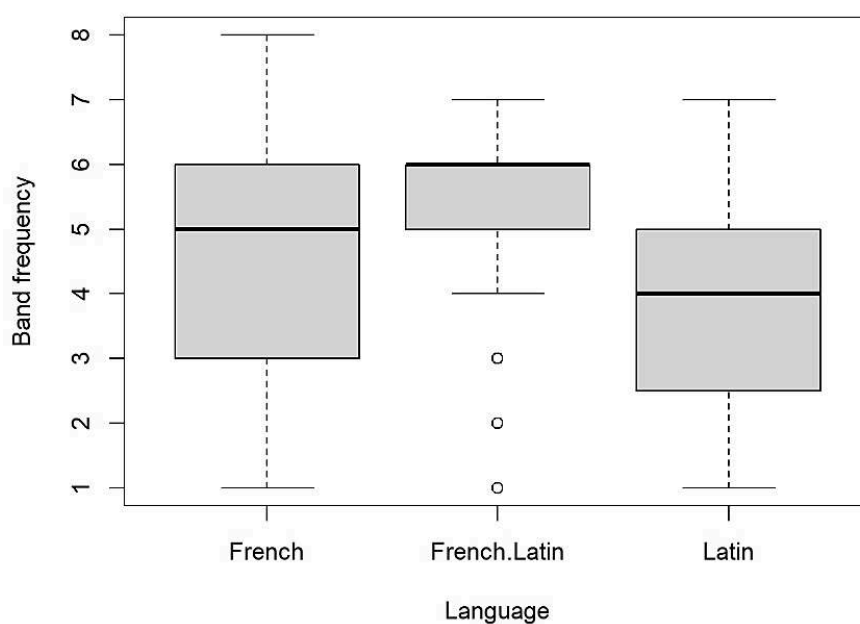
28 Finally, to identify the overall trends in our dataset, we ran a Principal Component Analysis, a dimension reduction and clustering technique. We fitted the model using the following features (cf. Section 2.2.):

- (1) year of the first attestation of a word ("Year.1");
- (2) year of the last attestation of a word ("Year.2");

- (3) band frequency of a word (“Band_fr”);
- (4) period of the first attestation of a word (i.e., “OE”, “ME”, “EModE”, “LModE”, “PDE”);
- (5) root etymology of a word (“English”, “French”, “French.Latin”, “Latin”, “Greek” and “Scandinavian”);
- (6) a range of the most type-frequent word-formation processes with the involvement of suffixes (i.e., “R.ity”, “R.ing”, “R.ism”, “R.ist”, “R.ment”, “R.ness” and “R.er”).
- (7) membership in the COGNITION or EMOTION lexicon (“Cognition” and “Emotion”).

- 29 The results are shown in Figure 7, where data points (pink and blue circles) represent words in the lexicons and arrows represent the aforementioned (1-7) variables. The model has twenty-seven components, the first twenty-three of which cumulatively explain 99.6% of the variance. This suggests that the dataset is highly dimensional and complex, and that important information about the COGNITION and EMOTION lexicon is distributed across many features. The first two dimensions of the model account for 21.3% of the variance in the dataset. The variance along the first dimension (*x*-axis) is primarily influenced by whether the word is obsolete or still in use (i.e., “Band_fr” and “Year.2”), as well as its native origin, as suggested by the longest arrows for these variables. On the other hand, the variance along the second dimension (*y*-axis) is largely defined by the membership of a word in the COGNITION or EMOTION lexicons. Two neat clusters are distinguished in the model: the COGNITION cluster extending across two bottom quadrants of the biplot, and the EMOTION cluster in the upper quadrants of the biplot.
- 30 The distinction of these two clusters makes it possible to identify associations between the COGNITION and EMOTION nouns, and other variables. Regarding the expansion of the two lexicons, the expression of EMOTION has a closer association with the Middle English period, while the expression of COGNITION is more closely associated with post-medieval times (from Early Modern to Present-Day English). In terms of source languages, results are as expected: the Old English period is closely linked with native terms, the Middle English period with borrowings from Old Norse, and the Early Modern English period with borrowings from Latin and French / Latin. Furthermore, French exhibits closer connections to the Middle and Late Modern English periods, with a slightly stronger association with the former. With respect to word-formation processes, the suffixes *-ing*, *-ness*, *-ist*, *-ism* and *-ment* have a greater association with the EMOTION lexicon; and the suffixes *-er*, *-(at)ion* and *-ity* with the COGNITION lexicon. Finally, conversion is more closely linked to the EMOTION lexicon, whereas compounding and alternation show stronger associations with the COGNITION lexicon.

Figure 8. Distribution of band frequency in the active terms for COGNITION



4. Features of the nouns referring to COGNITION and EMOTION in Middle English

- 32 We explore here the development of the COGNITION and EMOTION lexicons during Early Middle English (EME; 1150-1349) and Late Middle English (LME; 1350-1499) in greater detail. Section 4.1. focuses on the development of the semantic subfields across these periods; we then delve into their etymological composition, in terms of the source languages of the nouns' roots (Section 4.2.) and the word-formation processes involved in their coinage during this period (Section 4.3.).

4.1. Lexical development across time: Semantic subfields

- 33 Figures 1, 5 and 7 above show that the Middle English period made a significant contribution to the English vocabulary of COGNITION and EMOTION as a whole, and in connection with the terms that are still in use today. As noted in Section 3.1., this period is strongly associated with the lexicalization of various subfields of EMOTION. After all, this period witnessed much lexical change, to a large extent because the new sociolinguistic situation and new tastes in poetic forms (where alliteration, with its requirement for near-synonyms starting in different sounds, was, in the main, replaced by syllabic count and rhyme) following the Norman Conquest are likely to have played an important role in the loss of a large number of Old English terms⁹: e.g., Diller [2014: 114] reports that over 2,000 words referring to EMOTION became obsolete by the Early Middle English period. As the expression of EMOTION is an “onomastic low-

pressure area”, new ways to lexicalize these concepts soon developed, reflecting the multilingual culture of medieval England.

- 34 Figures 9-10 allow us to zoom in (cf. Figure 2) on the prominence of semantic subfields during the two periods. Figure 9 shows much consistency between the COGNITION nouns first attested during these periods and the overall distribution of the nouns in use at the time (but note the introduction of general terms referring to MENTAL CAPACITY in Early Middle English), as well as between the Early and Late Middle English periods, although the charts also suggest that the association between the Middle English period and MEMORY reported above (Section 3.1.; cf. as well PERCEPTION / COGNITION) is particularly the result of lexical changes during the Late Middle English period.

Figure 9 (a). Distribution of the COGNITION subfields across the Early and Late Middle English periods: terms first attested during these periods

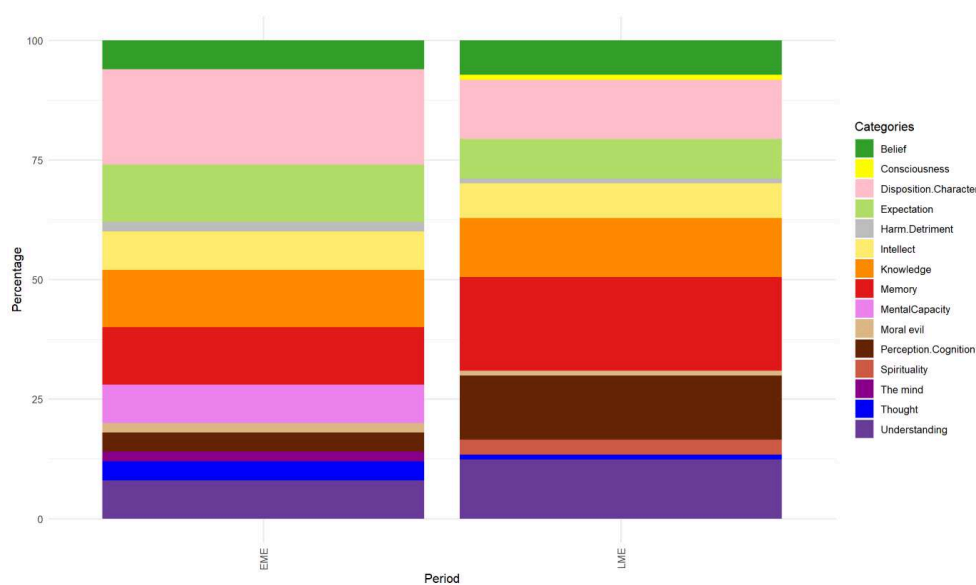
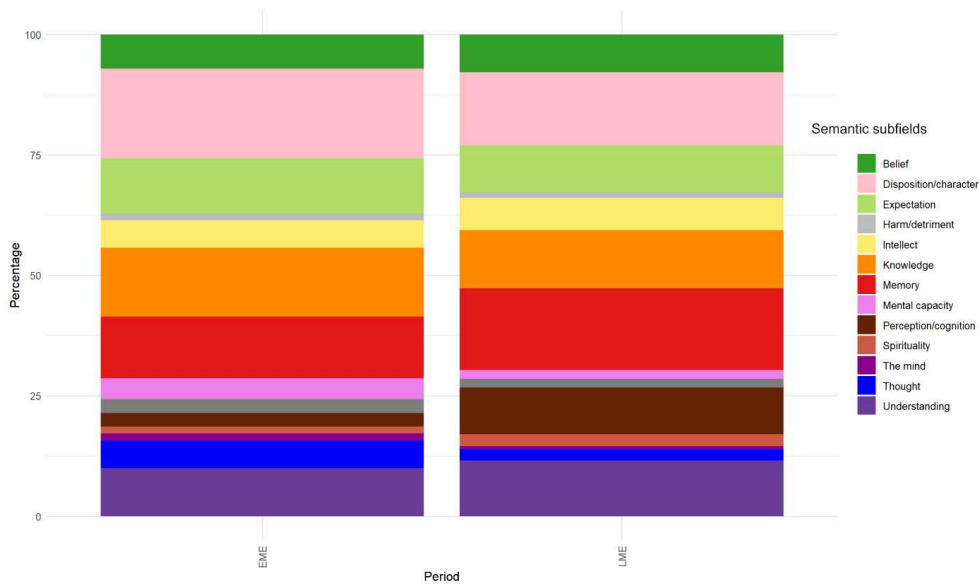


Figure 9 (b). Distribution of the COGNITION subfields across the Early and Late Middle English periods: terms in use during these periods



- 35 Similarly, Figure 10 suggests that there is much consistency in connection with the proportions of nouns newly introduced to refer to specific emotions and the overall distribution of nouns that were in use during the period. However, in this case, there is more disparity between the Early and Late Middle English periods, with nouns referring to COMPASSION and SUFFERING being more prominent in the Early Middle English period and nouns referring to ANGER and PLEASURE in Late Middle English (cf. Figure 2).

Figure 10 (a). Distribution of the EMOTION subfields across the Early and Late Middle English periods: terms first attested during these periods

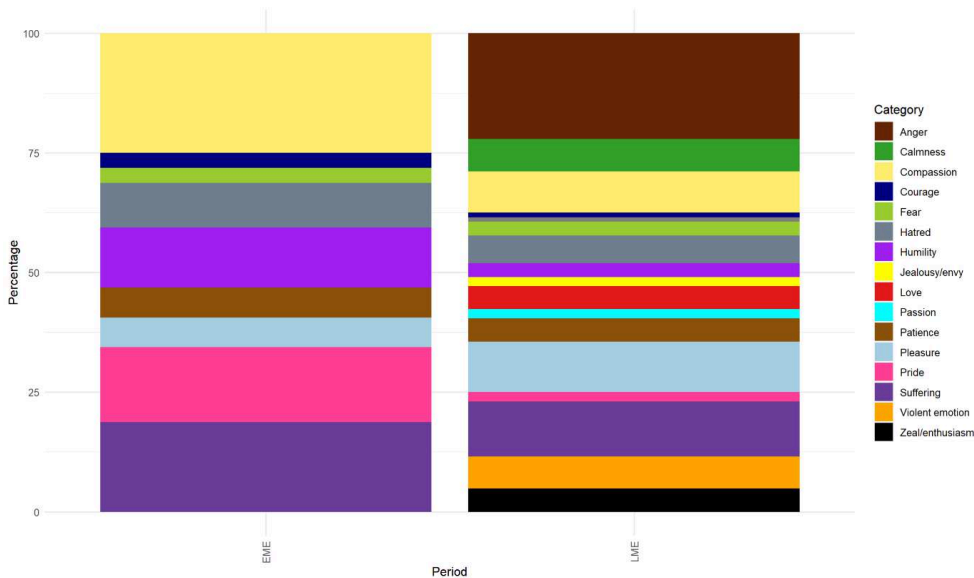
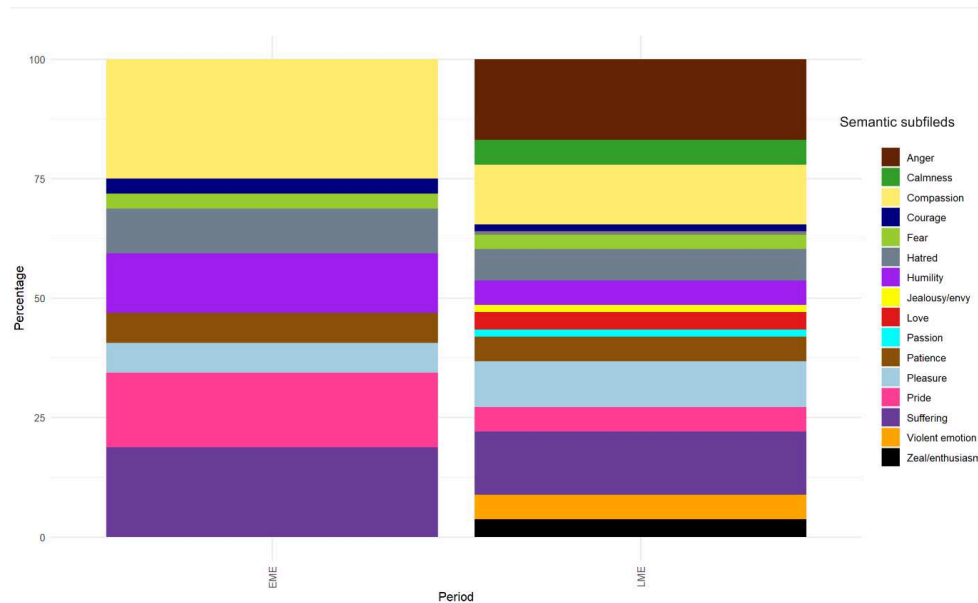


Figure 10 (b). Distribution of the EMOTION subfields across the Early and Late Middle English periods: terms in use during these periods



4.2. Etymological make-up of the nouns for COGNITION and EMOTION in Middle English: Source languages

- 36 Sections 3.2. and 3.3. have given us an overview of the multilingual origin of the nouns referring to COGNITION and EMOTION that were newly introduced into the language as a result of word-formation or borrowing, and the fact that there are disparities across the various languages that have influenced the vocabulary in these two fields. These disparities are already present in the Middle English period: e.g. there are four times as many nouns with Latin roots in the expression of COGNITION (twelve) than EMOTION (three), but almost three times as many nouns with Norse-derived roots in the expression of EMOTION (nineteen) than COGNITION (seven). Understandably, the proportions are different to those reported in Section 1 (cf. Grant [2009: 372]) because of the sociolinguistic situation during the Middle English period, when the influx of Latin terms had not reached its peak yet and Norse-derived terms were still prevalent, particularly in dialects associated with the Scandinavianized areas. The prominence of nouns with a French or French / Latin root amongst those that are first attested during the Middle English period has already been noted, and Figure 11 makes clear that this is the case for the various subfields, although the expression of LOVE relies very heavily on native roots, a trend that continued during the other periods (cf. Figure II in the appendix).

Figure 11 (a). Distribution of the nouns first attested during the Middle English period in terms of semantic subfields and source language of the root: COGNITION

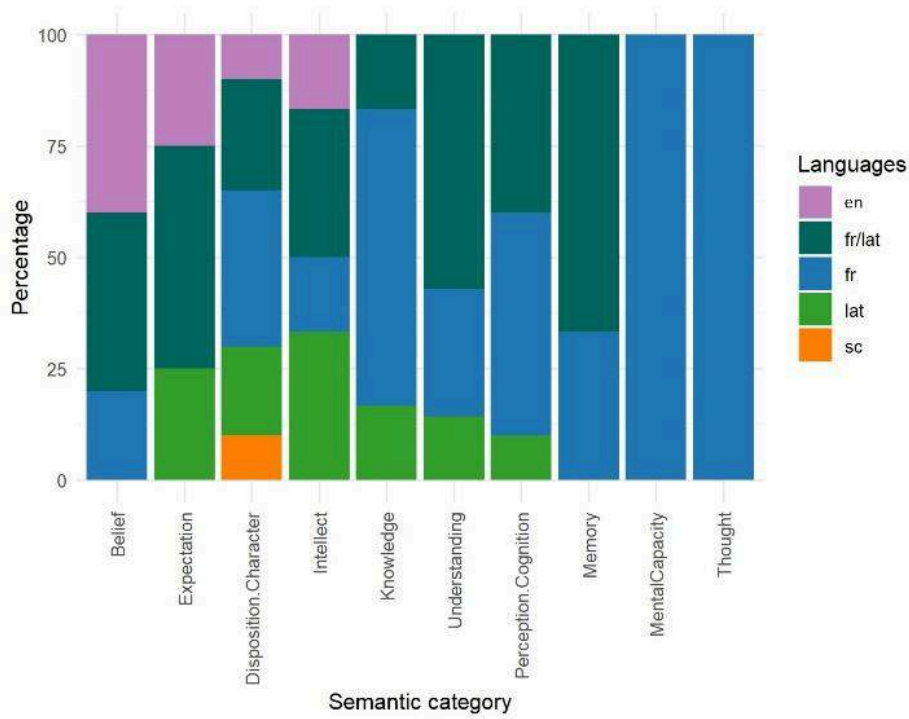
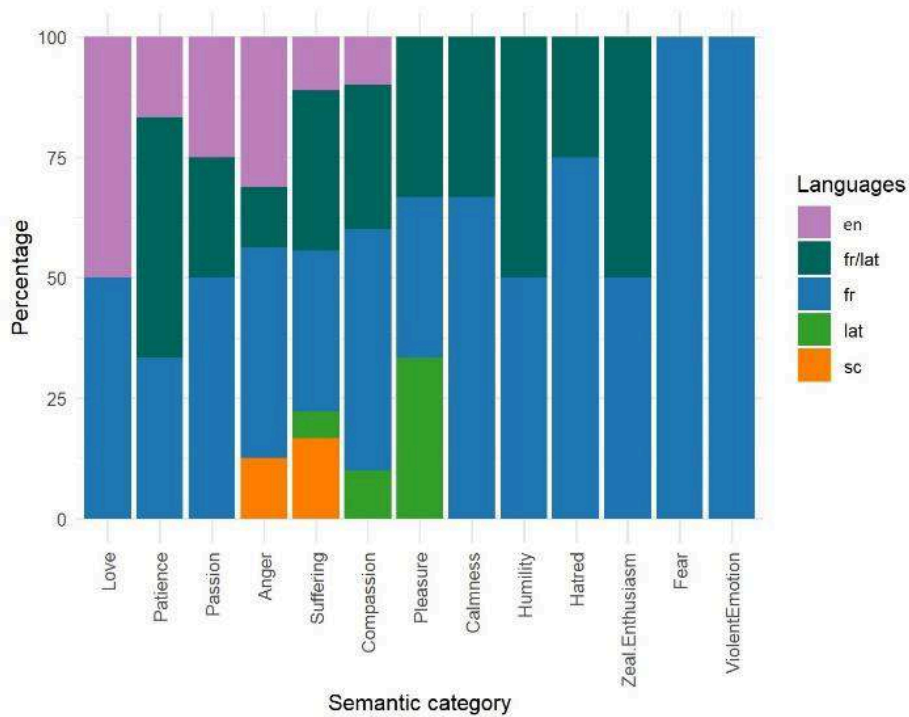


Figure 11 (b). Distribution of the nouns first attested during the Middle English period in terms of semantic subfields and source language of the root: EMOTION



- 37 An examination of the etymological development of the nouns referring to COGNITION and EMOTION reveals a shift in etymological trends during the Middle English period (see Figure 12). In both cases, there was increased prominence of French and French / Latin roots during the Late Middle English period and a decline in the reliance on native and Norse-derived roots, although native roots continued to play a very significant role in the expression of the two fields (see Figure 13). The former trend tallies with the fact that, as Ingham [this volume, with references] reports, in the thirteenth century individual bilingualism spread among the educated community, after an earlier period when French and English co-existed mainly through social bilingualism (i.e., the two languages were spoken by monolingual speakers). This facilitated, not only the transfer of specialized, technical vocabulary, which coincided with the fact that “English was expanding its range of functions considerably in official and formal contexts” (Durkin [2014: 251]; cf. Sylvester [2020]), but also, as noted by Ingham, the transfer of non-technical, everyday terms (cf. Durkin’s [2014: 411-15] analysis of terms referring to PHYSICAL SENSATION, 01.09 in *HTE*). Those terms became quickly integrated into the language, as suggested by their participation in word-formation processes (e.g. *cumbering*, *grievousness*, *gentleness* and *hancedede* are first attested at the beginning of the fourteenth century, very soon after, or at the same time as, their roots; see *OED* [s.vv. *cumber*, *cumbering*, *grievous*, *grievousness*, *gentle*, *gentleness*, *hance* and *hancedede*]; cf. Fincher [this volume] on early French loans in English). The rapid integration of non-technical vocabulary tends to be associated with situations of intense contact (e.g. Thomason [2001: 20-27]). In a previous publication Ingham showed that direct contact between monolingual English speakers and bilingual clergy, as part of the latter’s “everyday role of spiritual guidance” [2018: 207], was an important channel for the transmission of non-technical French loans into English, including those referring to “mental and emotional states” (Ingham [2018: 216]; cf. as well Ingham [2017]). What Figure 12 does not show, however, is diaphasic variation, i.e. the registers / text types that nouns of different origins were associated with.
- 38 The decrease in the attestation of new terms with a Norse-derived root in Late Middle English can be associated with the fact that language-shift from Norse to English, with the concomitant lexical transfer, is likely to have happened across England by the twelfth century (Parsons [2001]; Dance and Pons-Sanz [Forthc.]). Although the Early Middle English textual records are somewhat dialectally restricted, most of the Norse-derived terms in English were recorded by 1350, with later attestations often representing terms which have been formed through word-formation processes and / or whose distribution is highly restricted from a dialectal / textual perspective: e.g. ME *ourning* ‘anger’ is an English new-formation on the basis of ME *ournen* ‘to enrage; be enraged’ (cf. OIc *orna* ‘to get warm’). Both the noun and the verb are only attested in the sole surviving manuscript of the late Middle English text known as the *Siege of Jerusalem*, viz., Glasgow, University Library, Hunterian MS V.2.8; while *MED* gives “?1400” as the date of composition of the text, the manuscript has been dated to ca. 1540 and attributed to Thomas Chetham of Nuthurst, South Lancashire (Luttrell [1958: 46]; *OED* [s.vv. *ourn* and *ourning*], and *Middle English Dictionary* [s.vv. *ournen* and *ourning*]).

Figure 12 (a). Source language of the roots of nouns first attested during the Early and Late Middle English periods: COGNITION

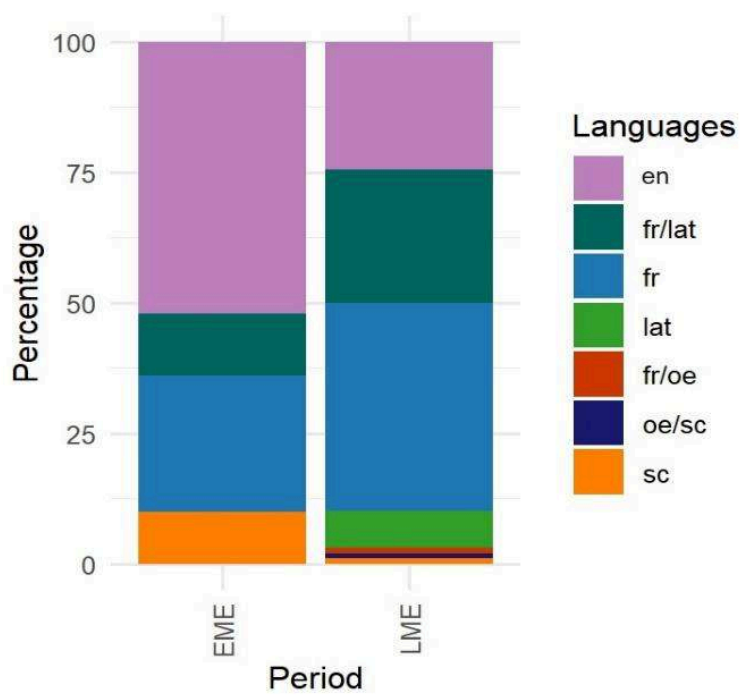


Figure 12 (b). Source language of the roots of nouns first attested during the Early and Late Middle English periods: EMOTION

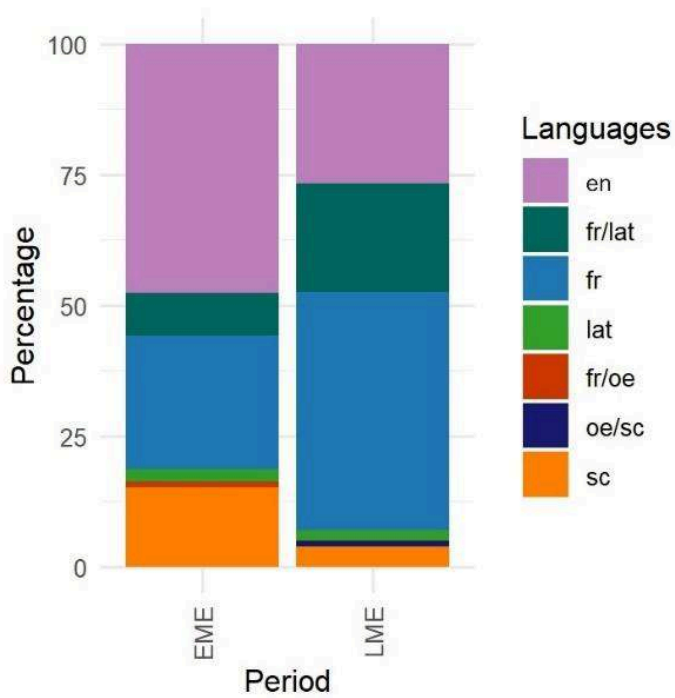


Figure 13 (a). Source language of the roots of nouns in use during the Early and Late Middle English periods: COGNITION

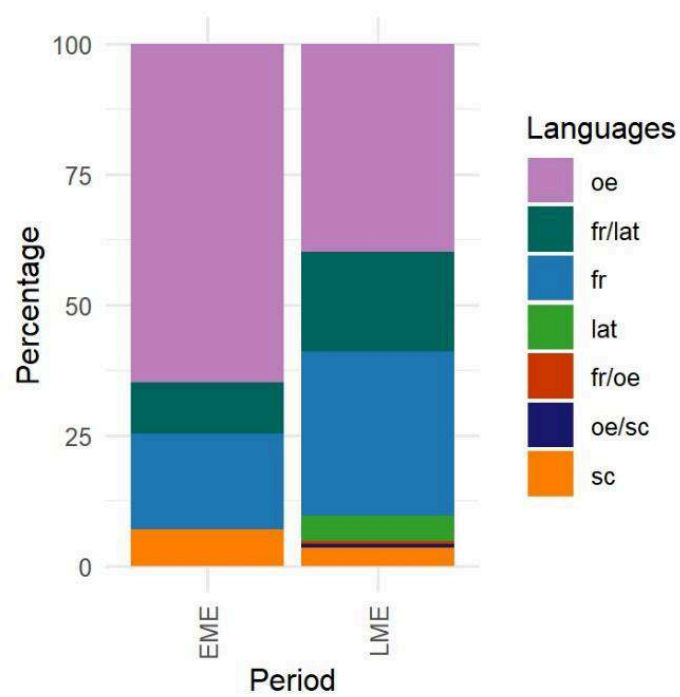
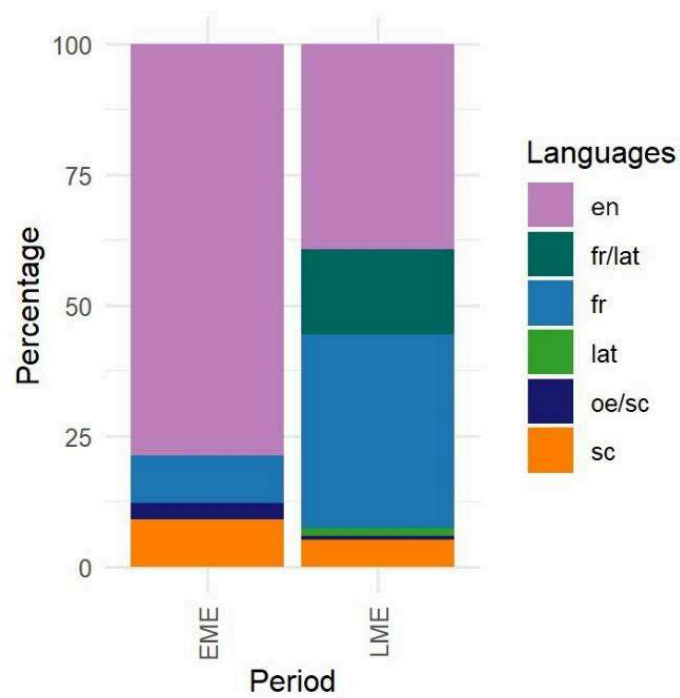


Figure 13 (b). Source language of the roots of nouns in use during the Early and Late Middle English periods: EMOTION



4.3. Etymological make-up of the Middle English nouns referring to COGNITION and EMOTION: Word-formation processes

- 39 Figure 6 (Section 3.3.) has shown that, overall, there is not much difference in terms of the word-formation processes that we see at play in the two semantic fields during the Middle English period. However, when the nouns are split into the two subperiods of Middle English (see Figure 14), a clear difference arises in connection with “R”, the category that refers to monomorphemic terms and terms that have been borrowed as a whole: while approximately half of the nouns referring to COGNITION first attested during these periods have not taken part in word-formation processes, as far as the nouns referring to EMOTION are concerned, this only applies to the Late Middle English period, while the Early Middle English period includes a much more even distribution of word-formation processes. The broader range of processes represented in Figure 14 (b) helps us to understand better the findings from Figure 6 regarding the stability of the word-formation processes involved in the coinage of EMOTION nouns across the history of the English language.

Figure 14 (a). Distribution of word-formation processes of nouns first attested during the Early and Late Middle English period: COGNITION

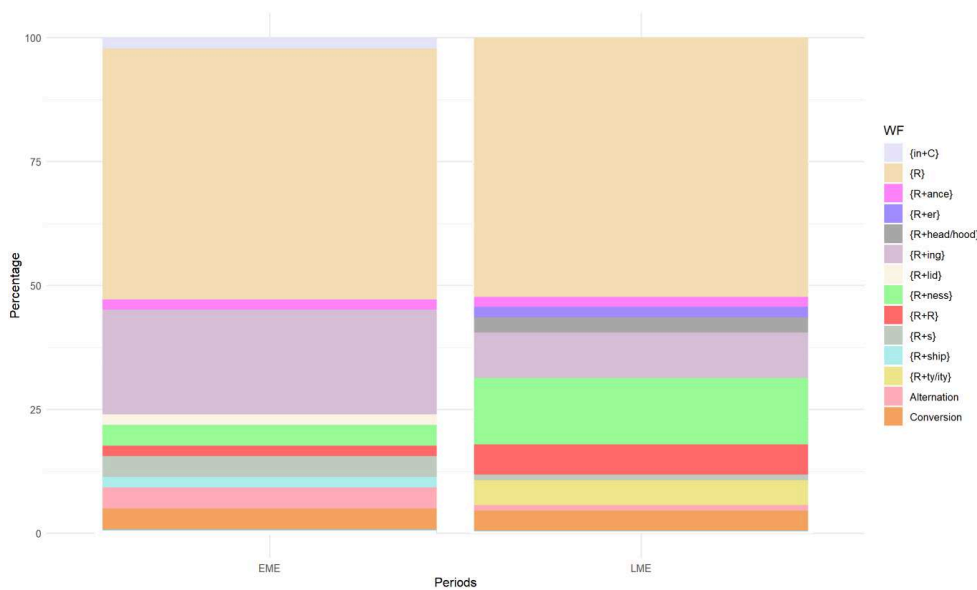
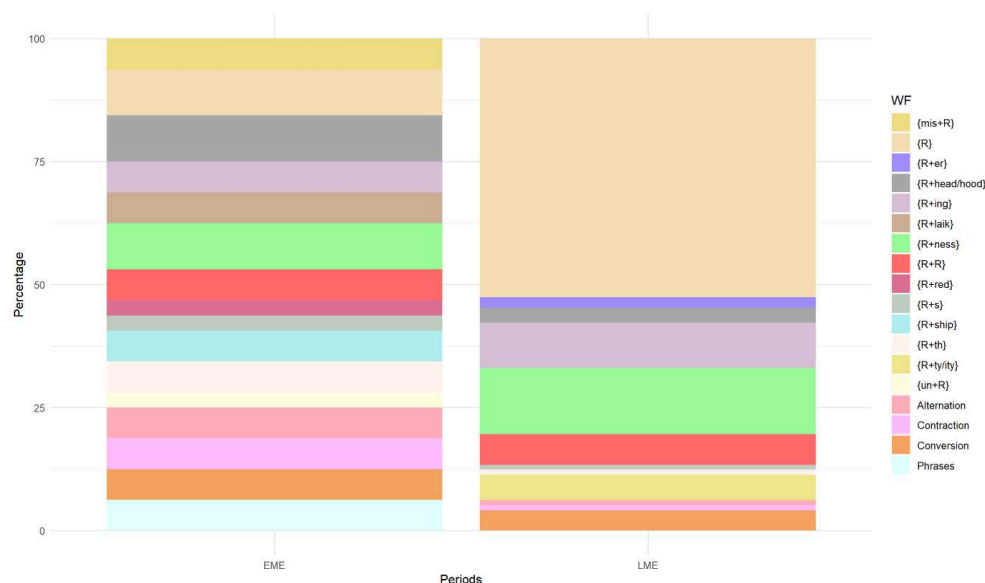


Figure 14 (b). Distribution of word-formation processes of nouns first attested during the Early and Late Middle English period: EMOTION



5. Conclusions

- 40 This study has analysed the diachronic evolution of the vocabulary for COGNITION and EMOTION in English, on the basis of the nouns that *HTE* identifies as referring to MENTAL CAPACITY (02.01) and EMOTION (02.04). Our results tally, in the main, with the findings of the Loanword Typology Project, with higher rates of borrowing amongst the COGNITION nouns, on the one hand; and with a more significant presence of nouns from Latin and Greek in the expression of COGNITION (perhaps because of the association of these languages with learning and abstraction) and a higher proportion of Norse-derived nouns in the expression of EMOTION on the other.
- 41 The COGNITION and EMOTION lexicons exhibit certain differences in their developmental trajectory. In the COGNITION field, each historical period has a stronger association with particular subfields and trends in source languages and / or word-formation processes, although, overall, compounding, alternation and suffixes such as *-er*, *-ion* and *-ity* are particularly productive:
- Old English: KNOWLEDGE; the prefixes *ge-* and *mis-*
 - Middle English: MEMORY; the suffixes *-s* and *-ing*
 - Early Modern English: the general concepts associated with MENTAL CAPACITY and EXPECTATION; borrowing from French / Latin and Latin
 - Late Modern English: PERCEPTION / COGNITION and INTELLIGIBILITY; the suffix *-ment*
 - Present-Day English: INTELLECT; the suffix *-ation*
- 42 In addition, while this field overall includes a higher proportion of nouns with a Latin and French / Latin root, specific languages play more significant roles in particular subfields: English dominates in the expression of MORAL EVIL, THOUGHT, KNOWLEDGE and SPIRITUALITY; albeit important in all the subfields, French peaks in the expression of EXPECTATION and BELIEF; Latin is key for CONSCIOUSNESS, INTELLIGIBILITY, LACK OF UNDERSTANDING, HARM / DETRIMENT and PERCEPTION / COGNITION; terms from French and / or

Latin lead in MENTAL CAPACITY, MEMORY and DISPOSITION / CHARACTER ; Greek largely contributes to the CONSCIOUSNESS subfield; and Norse-derived terms are more numerous in the expression of MENTAL CAPACITY and DISPOSITION / CHARACTER.

- 43 Conversion and the suffixes *-ing*, *-ness*, *-ist*, *-ism* and *-ment* show a greater association with the EMOTION lexicon; here word-formation processes seem to be more consistent across the different periods, reflecting less temporal variation and more stable word-formation trends, although we can also see general trends between particular periods, on the one hand, and word-formation patterns and the lexicalization of particular emotions on the other:
- Middle English: FEAR, COMPASSION, PLEASURE and SUFFERING; the suffix *-ing*
 - Early Modern English: PATIENCE, VIOLENT EMOTION, PASSION and CALMNESS, alternation of another lexical item
 - Late Modern English: COURAGE; conversion and the suffixes *-ment*, *-ity* and *-er*
 - Present-Day English: EXCITEMENT; compounding, conversion and the suffix *-ness*
- 44 Overall, the EMOTION lexicon has a larger contribution of French- and Norse-derived roots than the COGNITION lexicon but, again, different languages contribute more to the lexicalization of the various emotions: English contributes especially in INTENSE EMOTION, PRIDE, HATRED, FEAR, JEALOUSY / ENVY, SUFFERING and PLEASURE; French is most prominent in LOVE, FURIOUS ANGER, COMPASSION, VIOLENT EMOTION and ZEAL / ENTHUSIASM; terms from French and / or Latin are particularly important in neutral emotions: UNEXCITABILITY, CALMNESS, INDIFFERENCE and ABSENCE OF EMOTIONS; Latin is important in EXCITEMENT, PATIENCE and CALMNESS; Old Norse is a key contributor to the subfield of HUMILITY; Greek roots can be found mainly in the subfields of EXCITEMENT, PATIENCE and CALMNESS.
- 45 The close exploration of the Middle English period has enabled us to provide further information about these general trends: e.g. the development of the expression of MEMORY can be associated mainly with the Late Middle English period. It is also during this period when we start to see the significant impact of Romance terms in the two lexico-semantic fields, although the particular sociolinguistic situation surrounding the use of French from the thirteenth century onwards can help explain the fact that EMOTION and COGNITION terms, especially those that are borrowed from French, started to become productive very soon after their introduction into the language.
- 46 While the study provides valuable insights into the diachronic development of the cognition and emotion lexicons, it is important to acknowledge several limitations. We have used exploratory methods (i.e., stacked bar plots and clustering techniques), which have allowed us to identify the main trends and associations in the dataset. To substantiate these trends with greater confidence, it is essential to focus on each trend individually and employ statistical comparisons of features between different groups (languages, semantic subfields, word-formation processes or language periods). However, our sample is relatively small, especially given the number of words in each language period; accordingly, it has not been possible to make full use of inferential statistics. Notwithstanding these constraints, our study offers important insights into the development of these two semantic fields in general and the impact that medieval multilingualism had on their make-up in particular.

BIBLIOGRAPHY

Dance, Richard & Sara M. Pons-Sanz. Forthc. The Scandinavian influence. In Laura Wright & Raymond Hickey (eds.), *New Cambridge history of the English language*, vol. 1. Cambridge: Cambridge University Press.

Diller, Hans-Jürgen. 2014. *Words for feelings: Studies in the history of the English emotion lexicon*. Heidelberg: Winter Universitätsverlag.

Durkin, Philip. 2014. *Borrowed words: A history of loanwords in English*. Oxford: Oxford University Press.

Fincher, Max. Forth.. *A quantitative and qualitative analysis of French loanwords in Early Middle English*. Bristol: University of Bristol PhD dissertation.

Fischer, Andreas. 2004. The notional structure of thesauruses. In Christian J. Kay & Jeremy Smith (eds.), *Categorization in the history of English*, 41-58. Amsterdam: John Benjamins.

Grant, Anthony P. 2009. Loanwords in British English. In Martin Haspelmath & Uri Tadmor (eds.), *Loanwords in the world's languages: A comparative handbook*, 360-383. Berlin: De Gruyter Mouton.

Haspelmath, Martin & Bradley Taylor. 2010. Borrowability and the notion of basic vocabulary. *Diachronica* 27(2). 226-246.

Haspelmath, Martin & Uri Tadmor (eds.). 2009a. *Loanwords in the world's languages: A comparative handbook*. Berlin: De Gruyter Mouton.

Haspelmath, Martin & Uri Tadmor. 2009b. The loanword typology project and the world loanword database. In Martin Haspelmath & Uri Tadmor (eds.), *Loanwords in the world's languages: A comparative handbook*, 1-34. Berlin: De Gruyter Mouton.

Hock, Hans H. 1991. *Principles of historical linguistics*, 2nd edn. Berlin: Mouton de Gruyter.

Ingham, Richard. 2017. Middle English borrowing from French: Nouns and verbs of interpersonal cognition in the Early South English Legendary. In Carolyn Collette & Thelma Fenster (eds.), *French in medieval England: Networks, exchanges, collaborations, essays in honour of Jocelyn Wogan-Browne*, 128-139. Woodbridge: Boydell.

Ingham, Richard. 2018. The diffusion of higher-status lexis in medieval England: The role of the clergy. *English Language and Linguistics* 22(2). 207-224.

Kassambara, Alboukadel & Fabian Mundt. 2020. Factoextra: Extract and visualize the results of multivariate data analyses. R package version 1.0.7. Available at <https://CRAN.R-project.org/package=factoextra>. (26 June 2024)

Kiricsi, Ágnes. 2010. The lexicon of mind and memory: *Mood* and *mind* in Old and Middle English. In Alaric Hall, Olga Timofeeva, Ágnes Kiricsi & Bethany Fox (eds.), *Interfaces between language and culture in medieval England: A festschrift for Matti Kilpiö*, 267-288. Leiden: Brill.

Koivisto-Alanko, Päivi. 1997. The vocabulary of cognition in early English translations of Boethius from Chaucer to Preston. *Neuphilologische Mitteilungen* 98(4). 397-414.

- Koivisto-Alanko, Päivi. 1999. Cognitive loanwords in Chaucer: Is superstandard nonstandard? In Irma Taatvitsainen, Gunnel Melchers & Päivi Pahta (eds.), *Writing in nonstandard English*, 205-22. Amsterdam: John Benjamins.
- Krykoniuk, Kateryna. 2022. *Morphological regularities and patterns in English word formation*. Cardiff: Cardiff University PhD dissertation.
- Lass, Roger. 1997. *Historical linguistics and language change*. Cambridge: Cambridge University Press.
- Le, Sébastien, Julie Josse & François Husson. 2008. FactoMineR: An R package for multivariate analysis. *Journal of Statistical Software* 25(1). 1-18. Available at <https://www.jstatsoft.org/article/view/v025i01>. (28 August 2024)
- Luttrell, C. A. 1958. Three north-west midland manuscripts. *Neophilologus* 42. 38-50.
- Mambelli, Gloria. 2024. *Onomasiological variation and change in the multilingual vocabulary of the medieval manor*. Verona: University of Verona, PhD dissertation.
- Matras, Yaron. 2009. *Language contact*. Cambridge: Cambridge University Press.
- Matras, Yaron. 2011. Universals of structural borrowing. In Peter Siemund (ed.), *Linguistic universals and language variation*, 204-234. Berlin: De Gruyter Mouton.
- Molencik, Rafał. 2018. From *sicker* to *sure*: The contact-induced lexical layering within the medieval English adjectives of certainty. *English Language and Linguistics* 22(2). 283-300.
- Molina, Clara. 2008. Historical dictionary definitions revisited from a prototype theoretical standpoint. *Annual Review of Cognitive Linguistics* 6(1). 1-22.
- Nenadic, Oleg & Michael Greenacre. 2007 Correspondence Analysis in R, with two- and three-dimensional graphics: The ca package. *Journal of Statistical Software* 20(3). 1-13. Available at <https://www.jstatsoft.org/article/view/v020i03>. (28 August 2024).
- Orchard, Andy. 2018. Fresh terror, new horror: Fear and the unfamiliar in the *Old English Exodus*. In Daniel McCann & Claire McKechnie-Mason (eds.), *In Fear in the medical and literary imagination, medieval to modern*, 131-156. London: Palgrave Macmillan.
- Parsons, David. 2001. How long did the Scandinavian language survive in England? Again. In James Graham-Campbell, Richard Hall, Judith Jesch & David N. Parsons (eds.), *Vikings and the Danelaw: Select papers from the thirteenth viking congress, Nottingham and York, 21-30 August 1997*, 299-312. Oxford: Oxbow Books.
- Pons-Sanz, Sara M. 2015. Norse-derived terms in Orm's lexico-semantic field of EMOTION. *Journal of English and Germanic Philology* 114(4). 552-586.
- Pons-Sanz, Sara M. 2022. Medieval multilingualism and the expression of EMOTION: FEAR in the Gawain-poet's texts. *English Language and Linguistics* 26(2). 361-398.
- Pons-Sanz, Sara M. Forthc.a. The lexico-semantic distribution of Norse-derived terms in late Middle English alliterative poems: Analysing the Gersum database. In Richard Dance, Sara M. Pons-Sanz & Brittany Schorn (eds.), *The legacy of medieval Scandinavian encounters with England and the insular world*. Turnhout: Brepols.
- Pons-Sanz, Sara M. Forthc.b. *Norse-derived terms in the Ormulum: A reappraisal*. York: Arc Humanities Press.
- Pons-Sanz, Sara M. Forthc.c. Norse-derived words. In Sara M. Pons-Sanz, Belén Méndez-Naya, Andrew Cooper & Marcelle Cole (eds.), *The language of the Ormulum*. Turnhout: Brepols.

- Prinz, Jesse. 2004. Which emotions are basic? In Dylan Evans & Pierre Cruse (eds.), *Emotion, evolution, and rationality*, 69-87. Oxford: Oxford University Press.
- R Core Team. 2022. *R: A Language and environment for statistical computing*. Vienna: R Foundation for Statistical Computing. Available at <https://www.R-project.org/>. (28 August 2024)
- Sylvester, Louise. 2020. The role of multilingualism in the emergence of a technical register in the Middle English period. In Laura Wright (ed.), *The Multilingual Origins of Standard English*, 365-380. Berlin: De Gruyter Mouton.
- Sylvester, Louise & Imogen Marcus. 2017. Studying French-origin Middle English lexis using the *Bilingual Thesaurus of Medieval England*: A comparison of the vocabulary of two occupational domains. In Catherine Delesse & Elise Louviot (eds.), *Studies in language variation and change*, vol. 2: *Shifting, switching and alternating patterns in the history of English*, 217-228. Newcastle upon Tyne: Cambridge Scholars Publishing.
- Sylvester, Louise, Megan Tiddeman & Richard Ingham. 2020. An analysis of French borrowings at the hypernymic and hyponymic levels of Middle English. *Lexis: Journal of English Lexicology* 16. Available at <https://doi.org/10.4000/lexis.3576>. (13 September 2024)
- Sylvester, Louise, Megan Tiddeman & Richard Ingham. 2022. Lexical borrowing in the Middle English period: A multi-domain analysis of semantic outcomes. *English Language and Linguistics* 26(2). 237-261.
- Thomason, Sarah G. 2001. *Language contact*. Washington DC: Georgetown University Press.
- Timofeeva, Olga. 2018. Survival and loss of Old English religious vocabulary between 1150 and 1350. *English Language and Linguistics* 22(2). 225-247.
- Tyshchenko K. 2003. La morfologia formale del verbo italiano. In Stanisław Widłak, Maria Maślanka Soro & Roman Sosnowski (eds.), *Lingua e letteratura italiana dentro e fuori la penisola: Atti del III Congresso degli italianisti europei (Cracovia, 11-13 ottobre 2001)*, 521-527. Krakow: Wydawnictwo Jagiellonskiego.
- Vogelsanger, Johanna. 2023. Survival factors in the early Middle English lexicon. *English Language and Linguistics* 27(4). 1-31.
- Weinreich, Uriel. 1953. *Languages in contact: Findings and problems*. The Hague: Mouton.
- Wickham, H. 2016. *ggplot2: Elegant graphics for data analysis*. New York: Springer.
- Winford, Donald. 2003. *An introduction to contact linguistics*. Oxford: Blackwell.

Corpus and online tools

- Bosworth-Toller's Anglo-Saxon dictionary*. 2014. Joseph Bosworth & Thomas Northcote Toller (eds.). Digital edition compiled by Sean Christ and Ondřej Tichý. Faculty of Arts, Charles University in Prague. Available at <http://bosworthtoller.com> (8 July 2024)
- BTh = The bilingual thesaurus of everyday life in medieval England*. 2017. Ingham, Richard & Louise Sylvester (eds.) Glasgow: University of Glasgow. Available at <https://thesaurus.ac.uk/bth/>. (30 July 2024)
- World loanword database*. 2009c. Haspelmath, Martin & Uri Tadmor (eds.). Munich: Max Planck Institute for Evolutionary Anthropology. Available at <http://wold.cld.org>. (30 July 2024)
- HTE = The historical thesaurus of English*. 2023. 2nd edn., version 5.0. Glasgow: University of Glasgow. Available at <https://ht.ac.uk/>. (30 July 2024)

Middle English dictionary. 2018. Online edn. in *Middle English Compendium* by Frances McSparran et al. (eds.). Ann Arbor: University of Michigan Library. Available at <http://quod.lib.umich.edu/m/middle-english-dictionary/>. (30 July 2024)

Oxford English dictionary online. 2000-. Oxford: Oxford University Press. Available at <https://www.oed.com>. (30 July 2024)

APPENDIXES

Appendix: Additional graphs

Figure I. (a) Distribution of semantic subfields across the language periods in the whole sample: COGNITION

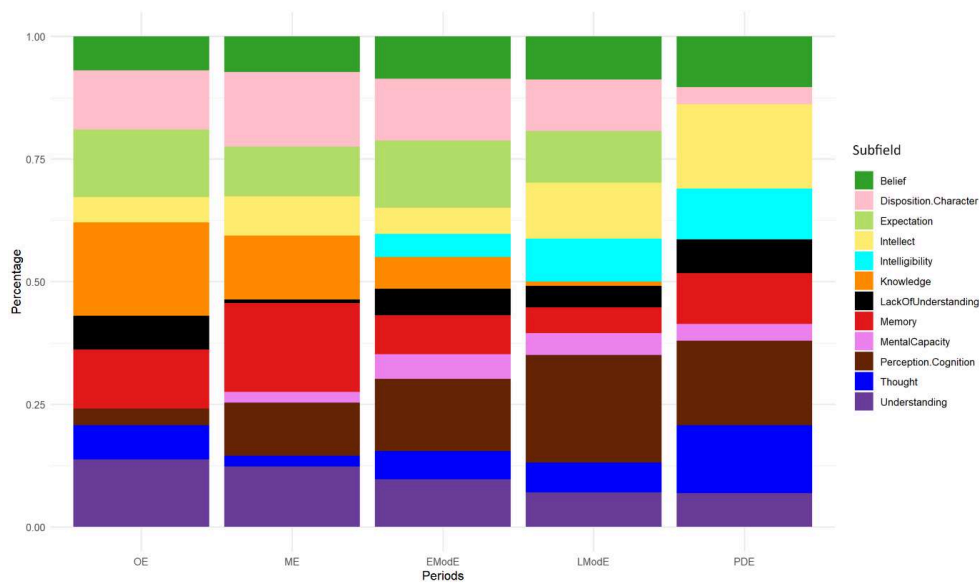


Figure I. (b) Distribution of semantic subfields across the language periods in the whole sample: EMOTION

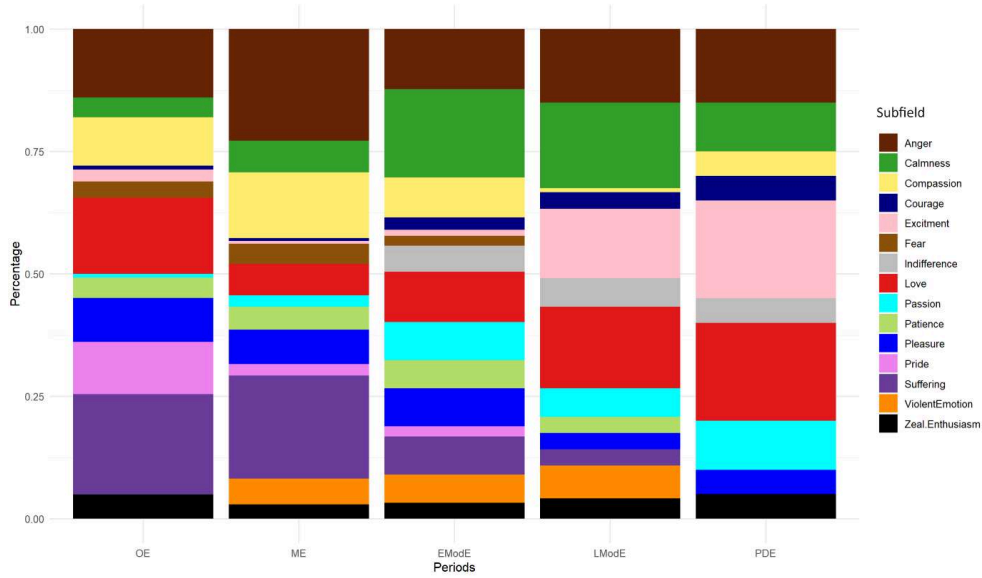


Figure II (a). Residual plot for the chi-square test comparing the contributions of borrowed roots and native roots to the semantic subfields: COGNITION

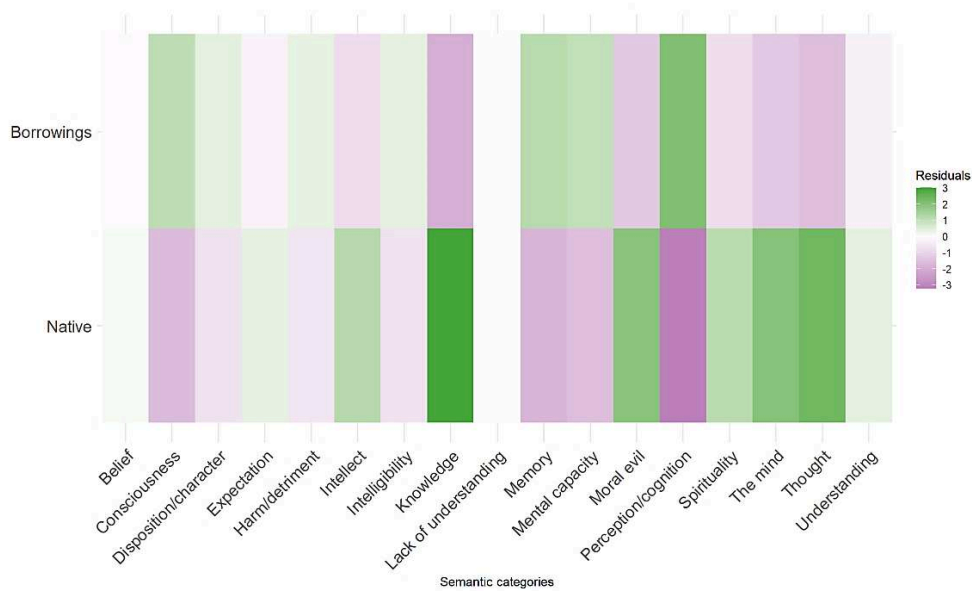


Figure II (b). Residual plot for the chi-square test comparing the contributions of borrowed roots and native roots to the semantic subfields: EMOTION

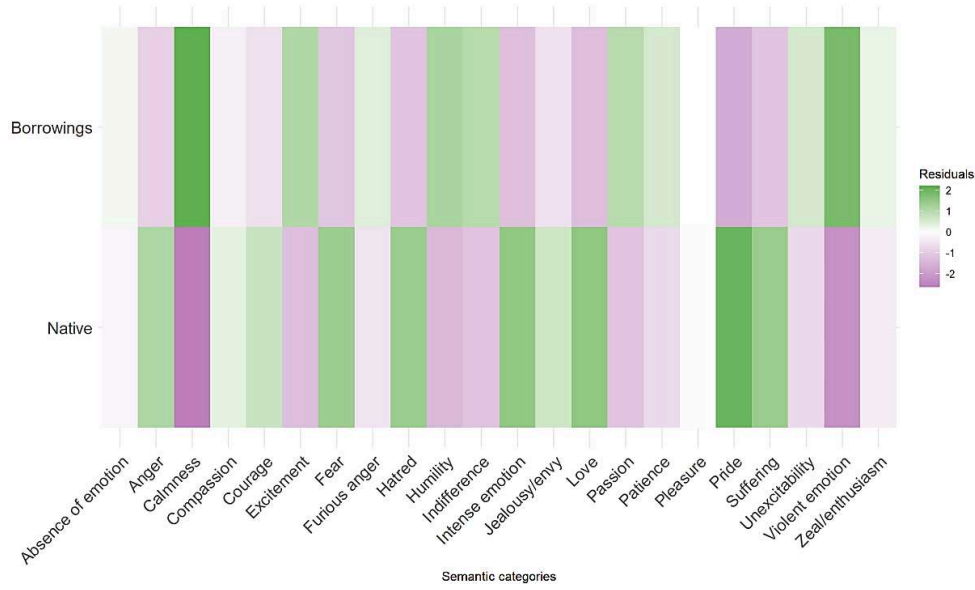


Figure III (a). Distribution of source languages across semantic subfields:

COGNITION

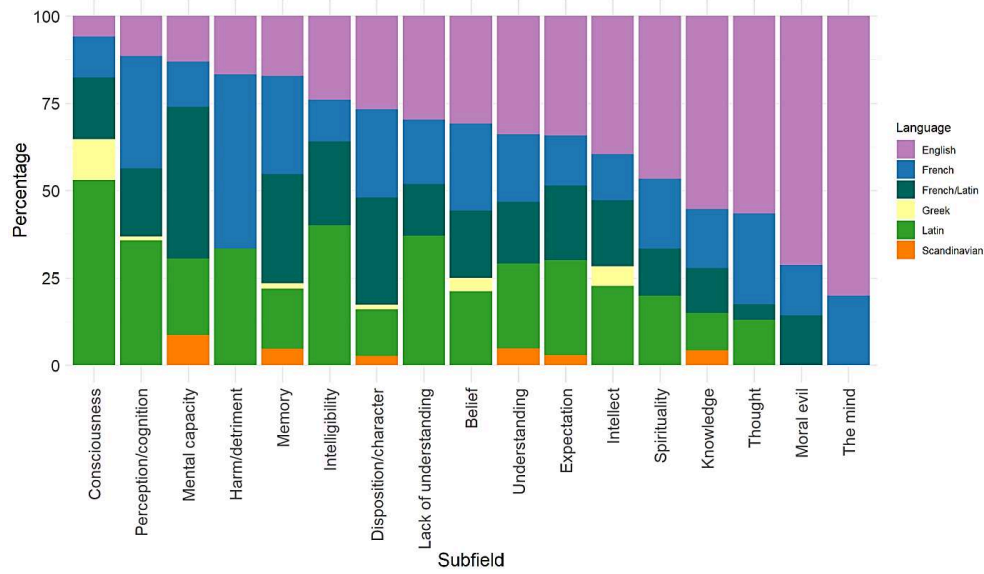


Figure III (b). Distribution of source languages across semantic subfields: EMOTION

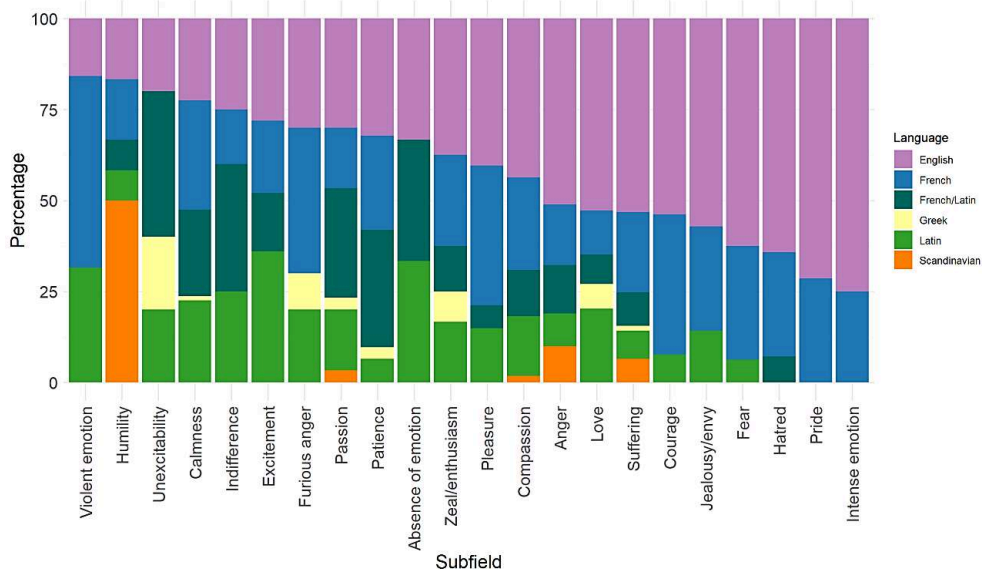


Figure IV (a). Word-formation processes across language periods: COGNITION ¹⁰

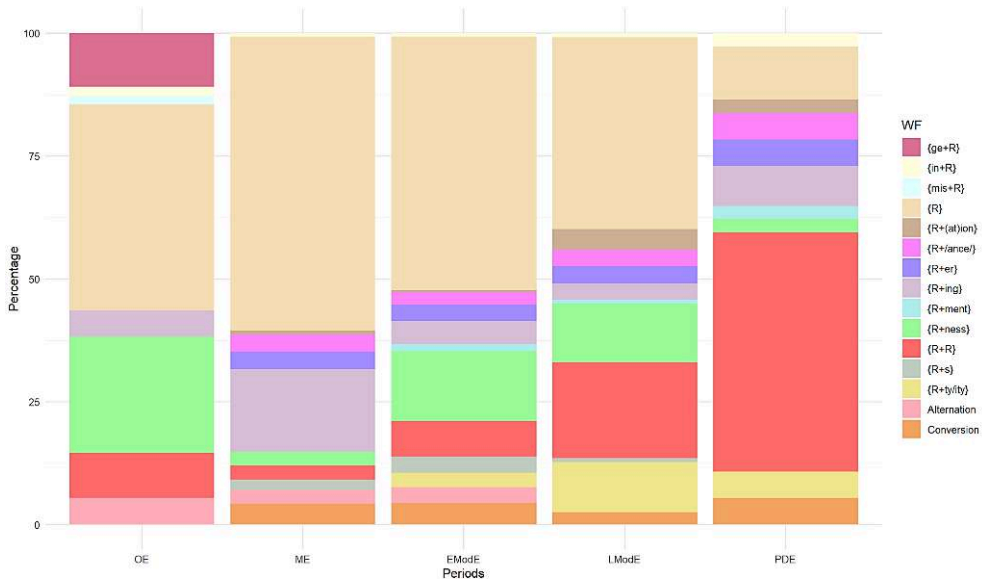
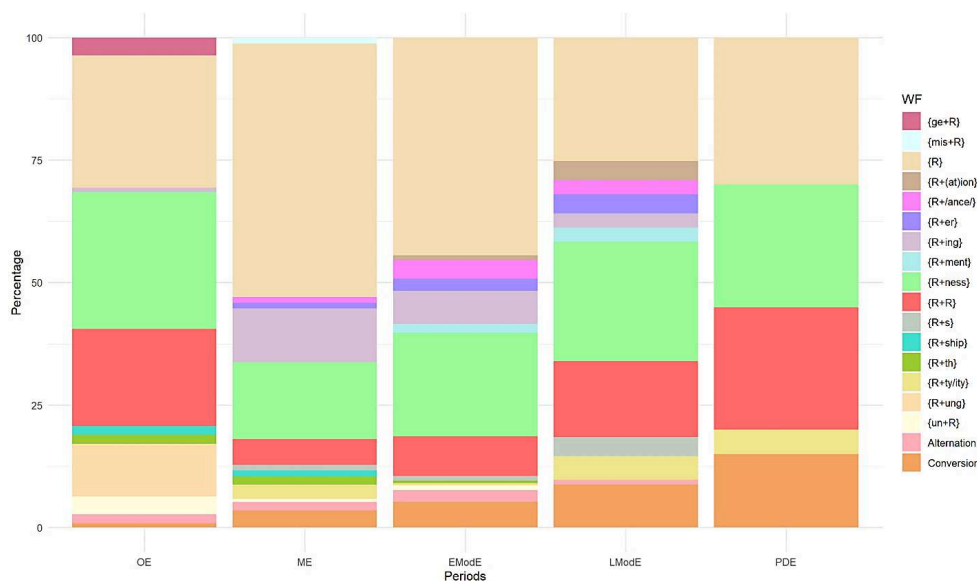


Figure IV (b). Word-formation processes across language periods: emotion



NOTES

1. This was done using RStudio's "sample()" function, with the "replace" argument set to "false" to prevent duplicate selections.
2. In the remainder of this paper, we use the term "association" to describe the observed trends in the model. This lexical choice is guided by two key reasons. First, we base our analysis on the dates of a word's earliest and latest attestation, which serve only as an approximation of its actual historical usage (cf. Section 2.2.). Second, the statistical analyses that we use in this paper allow to determine associations between the units of interest, but they do not reflect causal links between them. Therefore, a thorough understanding of the nature of these associations requires deeper exploration at a micro level, expanded analysis on a larger scale, and the integration of a broader array of materials and techniques.
3. We implemented these analyses in RStudio (R Core Team [2022]), supported by the following packages: "dunn.test" (Dinno [2024]), "FactoMineR" (Le *et al.* [2008]), "ggplot2" (Wickham [2016]) and "factoextra" (Kassambara & Mundt [2020]) and "ca" (Nenadic & Greenacre [2007]).
4. Dimension 1: eigenvalue of 0.115331, accounting for 70.4% of the total inertia; Dimension 2: eigenvalue of 0.025910, accounting for 15.8% of the total inertia.
5. Dimension 1: eigenvalue of 0.205094, accounting for 64.1% of the total inertia; Dimension 2: eigenvalue of 0.071673, accounting for 22.4% of the total inertia.
6. For the COGNITION lexicon: Dimension 1: eigenvalue of 0.176052, accounting for 42.2% of the total inertia; Dimension 2: eigenvalue of 0.113143, accounting for 27.1% of the total inertia. For the EMOTION lexicon: Dimension 1: eigenvalue of 0.176052, accounting for 42.24% of the total inertia; Dimension 2: eigenvalue of 0.113143, accounting for 27.15% of the total inertia.
7. Many of them have been considered to be basic emotions, but the dichotomy between basic (i.e, emotions that do not contain other emotions as parts and are innate, hence universal) vs. non-basic emotions is problematic (e.g. Prinz [2004]).
8. For the COGNITION lexicon: Dimension 1: eigenvalue of 0.184185, accounting for 44.4% of the total inertia; Dimension 2: eigenvalue of 0.148669, accounting for 27.1% of the total inertia. For the EMOTION lexicon: Dimension 1: eigenvalue of 0.203479, accounting for 58.3% of the total inertia; Dimension 2: eigenvalue of 0.102604, accounting for 29.4% of the total inertia.

9. The relationship between native and French loans has often been presented as one of competition where French terms ousted Old English (near-)synonyms in a wide range of semantic fields because of the prestige of the language of the new ruling classes. See, however, Sylvester & Tiddeman [this volume], with references, for a more nuanced approach to the interaction between terms of different origins. On the role of alliteration in the proliferation of terms for EMOTION in Old English, see Orchard [2018], who focuses on terms for FEAR. On the lexical richness of Middle English texts associated with the “Alliterative Revival” and its impact on the expression of COGNITION and EMOTION, see Pons-Sanz [2022 and Forthc.a]; see also Sylvester & Tiddeman [this volume], with references.

10. Key: “R” stands for monomorphemic root / word borrowed as a whole, and curly brackets indicate morphological formations.

ABSTRACTS

Existing research has shown that there is much variation in diachronic development and borrowability rates across different semantic fields in English, but most work up to now has focused on specialized or technical vocabulary, rather than fields associated with how people express and conceptualize their feelings and thoughts. While some studies have explored the historical evolution of the EMOTION lexicon (e.g., Diller [2014]) and, to a lesser extent, the COGNITION lexicon (e.g., Kiricsi [2010]), the contrastive study of these semantic categories has yet to be a focus in the research landscape. Therefore, this paper aims to explore the development of the COGNITION and EMOTION lexicon over a period of thousand years, from Old to Present-Day English. We compare the emergence of words in these two semantic fields across three key dimensions: semantic subfields, source languages of roots and morphological structure. For this purpose, we created a sample of approx. 1400 nouns on the basis of the *Historical Thesaurus of English* (HTE; categories: 02.01 MENTAL CAPACITY and 02.04 EMOTION) and analysed their etymology with the help of the *Oxford English Dictionary*. To annotate the lexical items in our sample, we used the methods of formal-morphological analysis (e.g., Tyschenko [2003]; Krykoniuk [2022]) and semantic analysis (e.g., Pons-Sanz [2022]; HTE [2023]). We analyse our sample with clustering techniques (i.e., Principal Component Analysis and Correspondence Analysis) to determine general trends across the two lexicons (e.g. a greater involvement of Latin roots and compounding in the formation of the COGNITION lexicon, and Norse-derived roots and conversion in coinage of nouns referring to EMOTION), as well as specific features of each period of the English language (e.g. the significant impact that the Middle English period had on the lexicalization of MEMORY, FEAR, COMPASSION, PLEASURE and SUFFERING, and the early integration of French-derived terms, as suggested by word-formation processes).

De nombreux travaux de recherche révèlent une grande variation dans le développement diachronique et les taux d'empruntabilité entre les différents champs sémantiques de l'anglais, mais la plupart des travaux jusqu'à présent se sont concentrés sur le vocabulaire spécialisé ou technique, plutôt que sur les domaines associés à la façon dont les gens expriment et conceptualisent leurs sentiments et leurs pensées. Alors que certaines études ont exploré l'évolution historique du lexique des émotions (par exemple, Diller [2014]) et, dans une moindre mesure, du lexique de la cognition (par exemple, Kiricsi [2010]), l'étude contrastive de ces catégories sémantiques n'a pas encore été au centre des recherches. Par conséquent, cet article

visé à explorer le développement du lexique de la cognition et des émotions sur une période de mille ans, de l'anglais ancien à l'anglais actuel.

Nous comparons l'émergence des mots dans ces deux champs sémantiques à travers trois dimensions : les sous-champs sémantiques, les langues sources des racines et la structure morphologique. À cette fin, nous avons créé un échantillon d'environ 1400 noms sur la base du *Thésaurus historique de l'anglais* (HTE ; catégories : 02.01 capacité mentale et 02.04 émotion) et nous avons analysé leur étymologie à l'aide de l'*Oxford English Dictionary*.

Pour annoter les éléments lexicaux de notre échantillon, nous avons utilisé les méthodes d'analyse formelle : morphologique (par exemple, Tyschenko [2003] ; Krykoniuk [2022]) et d'analyse sémantique (par exemple, Pons-Sanz [2022] ; HTE [2023]). Nous analysons notre échantillon avec des techniques de *regroupement* (c'est-à-dire, analyse en composantes principales et analyse des correspondances) pour déterminer les groupes de noms ayant des propriétés similaires. Grâce à cette approche, nous sommes en mesure d'identifier des tendances générales dans les deux lexiques (par exemple, l'implication plus importante des racines latines et de la composition dans la formation du lexique cognitif, et des racines et conversions dérivées du norrois dans la création de noms faisant référence à l'émotion), ainsi que des caractéristiques spécifiques de chaque période de la langue anglaise (par exemple, l'impact significatif que la période du moyen anglais a eu sur la lexicalisation de la mémoire, de la peur, de la compassion, du plaisir et de la souffrance, et l'intégration précoce de termes dérivés du français, comme le suggèrent les processus de formation des mots).

INDEX

Mots-clés: formation des mots, emprunt, cognition, émotion, moyen anglais, analyses de clustering

Keywords: word-formation, borrowing, emotion, cognition, Middle English, clustering analyses

AUTHORS

KATERYNA KRYKONIUK

Cardiff University, UK
k.krykoniuk@cardiff.ac.uk

SARA M. PONS-SANZ

Cardiff University, UK
pons-sanzs@cardiff.ac.uk