Diachronic word-formation: A corpus-based study of derived nominalizations in the history of English

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This dissertation investigates the history of derived nominalizations in English from 1500 to the present day, with special reference to the deverbal nominalizing suffix -(t)ion and the deadjectival nominalizing suffixes, -ness and -ity. The data are drawn from two historical corpora of English texts: The Early Modern section of HCET (Helsinki Corpus of English Texts, 1500-1700), and ARCHER (A Representative Corpus of Historical English Registers, 1650-1990). The case studies are situated within an integrated theoretical framework of change in derivational morphology which addresses neologising, productivity, variation, lexicalization and semantic change. Morphological productivity, a topic typically treated in synchronic morphology, is placed at the centre of this framework. The rationale for this approach is that the measurement of productivity provides a way to observe change in progress in derivational morphology. The chief task then, is to develop procedures for measuring productivity in historical corpora. The history of the suffixes will be investigated quantitatively by measuring their productivity across temporal periods and across text-type/register, and qualitatively by analysing derived nominalizations in discourse contexts to understand the effect of register and/or text type on nominalization. The result is a socio-historical account of derived nominalization, which demonstrates the ways in which neologising (and thus productivity) can be driven by contextual factors, discourse processes and stylistic considerations.
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Preface

I have been able to read for the degree of PhD through a generous scholarship from University of Cape Town Trusts, a grant from the Cambridge Commonwealth Trust, and an Overseas Research Award from the Committee of Vice-Chancellors and Principals of the United Kingdom. I have also received various grants from St Catharine’s College. In 1996/1997 I was hosted as a research scholar by the Department of English at Northern Arizona University.

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support of my family, Monica, Stuart and David Cowie, and my partner, Jimmy Roth, who have all performed countless small labours on my behalf.

I declare that this dissertation is my own work and is not substantially the same as any that I have submitted for a degree or diploma or similar qualification at any other university. No part of my dissertation has already been or is being concurrently submitted for any such degree, diploma or other qualification. This dissertation does not exceed the regulation length, including footnotes, references and appendices but excluding the bibliography.

Claire Cowie
Introduction

This project occupies itself with two questions. The first is: how is it possible to observe word-formation processes changing over time? And the second is: what are the factors that drive that change? The study is designed with the view that these questions can best be answered through an investigation of the behaviour of individual word-formation processes over a delineated time period, more specifically, in a diachronic corpus. Such an investigation contributes to the diachronic study of word-formation by providing a detailed and fine-grained understanding of the nature of change in word-formation. The affixational word-formation processes targeted in this study are three English nominalizing suffixes: the deverbal nominalizing suffix -(t)ion and the adjectival nominalizing suffixes, -ness and -ity.

I am concerned here with lexical or derived nominalization (derivational devices which create nouns from lexical verbs and adjectives) rather than clausal nominalization (devices by which entire predicates and propositions can be turned into noun phrases) (Comrie and Thompson 1985). Nominalizations created by derivational devices may denote the activity or state designated by the verb or adjective, or one of their arguments (agentive, instrumental, manner, locative, objective and reason nouns). Action/state nominalizations (action nouns from active verbs and state nouns from stative verbs or adjectives) retain properties of the verbs or adjectives they are attached to, but other derived nominalizations have unpredictable and idiosyncratic relationships toward their associated verbs or adjectives. Comrie and Thompson note that English has a “rich array” of suffixes for action/state nominalization, for example, create → creation, arrive →
arrival, stupid → stupidity, quiet → quietness. It is these action/state nominalizations in English which are the focus of this study.

The present study addresses certain gaps in linguistic theory. General works on morphology (Bauer 1988, Matthews 1991, Spencer 1991, Carstairs-McCarthy 1991, Anderson 1992, Katamba 1993) tend to be primarily concerned with inflectional morphology. If derivational morphology is discussed, dominating themes are the distinction between derivational and inflectional morphology, the relationship of derivational morphology to the lexicon, and accounting for the “lack” of productivity of derivational morphology. These works are primarily synchronic, and do not, with the exception of Anderson (1992), devote attention to change in morphology.

The majority of studies of English word-formation are taxonomic in nature, and comprehensively survey the range of word-formation processes that can be found in English. Thus in addition to affixation, there is much material on compounding, blends, clipping, acronyms, etc. This is true also of studies which approach English word-formation explicitly investigating lexical innovation or neologising (Cannon 1988). The bulk of the material is on Modern English (Adams 1973, Bauer 1983, Marchand 1969), although Marchand describes his approach as “synchronic-diachronic”. Studies of historical word-formation (Kastovsky 1992, Burnley 1992, Nevalainen forthcoming) also tend to survey a wide range of processes for a particular period in the history of English. Such surveys are extremely informative, but given the scope, accounts of individual processes are naturally limited. Studies of individual affixes (Gadde 1910, Jespersen 1939, Fleischman 1977, Gumier 1985, Riddle 1985) provide broad overviews of change and are not able, as such, to address the causes of change. Recently two major diachronic
studies of English affixation have emerged from corpus linguistics. These are
Dalton-Puffer’s 1996 study of suffixation in the Middle English section of the Helsinki
Corpus, and Baayen and Renouf’s 1996 study of the affixes *-ness, -ity, -ly, in- and un-* in
a modern English newspaper corpus. For *-ness* and *-ity*, data is not available for the
Early Modern and Modern English periods, and there is no data for developments in
*-tion* after Middle English.

The present study is empirical, making use of two historical corpora, the Early
Modern section of the Helsinki Corpus (1500-1700) and A Representative Corpus of
Historical English Registers, ARCHER (1650-1990). The unique aspect of this study is
the place it accords productivity in a diachronic theory of word-formation. I suggest that
change in a word-formation process can be observed on a microscopic level by
measuring changes in productivity. A related claim is that increases or decreases in
productivity are a reflection of the level of neologising taking place in that process. Given
that neologising is fundamentally extralinguistically motivated, extralinguistic factors are
privileged in the explanation of degree of productivity. In particular, I examine
differences in the innovating tendencies of styles or registers. Informally, “neologisms”
are words that are “new” in the language, but the items which fit this description depend
very much on the nature of data, for instance, whether they are taken from a dictionary or
a corpus.

Derivational morphology tends to occupy an uncomfortable position in most
descriptions of language systems. It is notoriously difficult to treat derivational
morphology as part of grammar. Not only is derivational morphology, as word-formation,
closely related to the lexicon, it is the creation of the lexicon, through the social and
cultural practice of neologising. Word-formation does not have social and cultural aspects merely, it is “conceptually driven” (Baayen and Renouf 1996). Extralinguistic factors are often dismissed as “idiosyncratic”, and “impossible to take into account systematically in a grammar of word formation” (Bauer 1983:97). In an account of change, extralinguistic factors must be central, and the experience of sociolinguists has taught us that it is possible to make the apparently chaotic and social, comprehensible.

This study does not treat issues such as the productivity of derivational affixes, variation or competition between derivational affixes, and the lexicalization of derivations as marginal. Rather, they are central aspects of the diachronic theory of word-formation in which the empirical study of the three affixes is located. Chapter 1 surveys the treatment of derivational morphology in historical linguistics and socio-historical linguistics. First, changes in derivational morphology are located within the broader topic of morphological change. I also consider the synchronic and diachronic relationships between derivational expression and other expression types (inflectional, lexical, syntactic). I then outline the range of changes undergone by derivational morphology, highlighting the changes described in this study. With regard to socio-historical linguistics, I discuss the social and stylistic dimensions of word-formation and the need for a theory of the motivations for neologising to be revised in the light of those dimensions.

Chapter 2 explores the notion of productivity applied to derivational morphology in synchronic morphological theory. It is evident that theories which use existing derivations to calculate productivity are inevitably concerned with diachrony, as derivations in the language will always reflect the productivity of various periods. I
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review various methods of comparing the productivity of a process at different periods, and measuring productivity over time. Accounts of productivity in derivational morphology are usually concerned with linguistic or structural factors. By contrast, extralinguistic factors have received limited attention, a shortcoming which I attempt to remedy. Chapter 3 provides specific details about the methodology of the present study: the selection of nominalizing affixes, the corpora, and the methods adopted for the identification of neologisms and the measurement of productivity in historical corpora.

Chapter 4 is a case study of deverbal nominalization in -(t)ion. The performance of -(t)ion over time is documented in the corpora, and innovation in -(t)ion for different registers is compared. This is followed by the close textual analysis of selected derivations, which promotes a better understanding of why certain registers coin more new action nominalizations in -(t)ion. A similar case study is undertaken for deadjectival nominalization in -ness and -ity in chapter 5. This case study deals with the additional aspect of competition, and I investigate whether this has historically affected the performance of the suffixes. I assess whether it is appropriate to apply a sociolinguistic model of variation and change to increases in the productivity of derivational affixes, and find that the basis for variation in derivational morphology is more complex than competition between two syntactically identical derivational affixes. Chapter 6 investigates lexicalization (the development of an idiosyncratic meaning not predictable from the word-formation rule) among nominalizations in -ness, -ity and -(t)ion in ARCHER, in an attempt to determine whether lexicalization is a systematic change for those nominalizations.
1 Derivational morphology in historical linguistics and socio-historical linguistics

It is not in dispute that, for whatever reason, certain human societies evolved along particular lines following a route from mobility to settlement; along those that settled, some evolved from agrarian to technological, and some of those again to scientific industrial. The question we are asking is: What part does language play in these fundamental changes in the relationship of human beings to their environment? One answer might be: none at all. It simply tags along behind, coining new words when new things appear on the scene but otherwise remaining unaffected in its content plane (its semantics and its grammar). ... We reject this view. In our opinion the history of language is not separate from the rest of human history; on the contrary, it is an essential aspect of it. Human history is as much a history of semiotic activity as it is of socio-economic activity. Experience is ongoingly reconstrued as societies evolve: such reconstrual is not only a necessary condition for their evolution – it is also an integral part of it. (Halliday and Martin 1993:10)

1. Introduction

Word-formation processes which involve affixation, or derivational morphology, are typically treated in two areas of historical linguistics: historical morphology, or, morphological change, and historical word-formation. The body of work in historical morphology is overviewed in section 2 of this chapter, with special emphasis on the treatment of derivational morphology within historical morphology. There are overlapping descriptive interests between historical linguists concerned with change on the morphological level, and synchronic morphologists concerned with diachronic aspects of the study of morphology. I examine the subject from both perspectives. In section 3 I set out the scope of a theory of change in derivational morphology and identify the areas that will receive attention in the remainder of this study.

In the second part of this chapter, I argue that the status of derivational morphology as a means of lexical innovation is a key component in understanding the nature of change in derivational morphology. The expansion of the lexicon through neologising is, I argue, primarily a social and extralinguistic phenomenon, and the
motivations for change in derivational morphology are chiefly extralinguistic in nature. These claims are made in sections 4-6. In section 7 I consider the category of register as an extralinguistic variable. The discussion of the innovative potential of derivational morphology, and the related issue of productivity, in word-formation theory (diachronic and synchronic), is continued in chapter 2.

2. Historical Morphology

Morphological change has been extensively studied, and the topic encompasses a wide range of diachronic phenomena and theories of explanation. The review of the literature in section 2.1. must remain in many areas superficial. The chief purpose of the review is to determine whether the existing articulation of the principles of morphological change, determined principally with respect to inflectional morphology, is relevant to derivational morphology. A related question is: have inflectional and derivational morphology been treated differently, and should they be treated differently, in a theory of morphological change? The much-debated distinction between inflectional and derivational morphology and its implications for a theory of change are considered in detail in section 2.2. There are two further issues that are relevant to the place of derivational morphology in a theory of morphological change. One is the relationship of the overall “morphological type” of a language to morphological change in that language, and change in the derivational morphology in particular (section 2.3.). The other is the range of concepts that tend to be expressed derivationally across languages (section 2.4.). It is not possible here to explore all the implications of either of these issues, but they should nevertheless be mentioned.
2.1. The study of morphological change

The study of “morphological change” is not limited to changes which are internal to the morphology. In fact, it is often more concerned with changes in which there is interaction between the morphology and the phonological and syntactic components of the grammar, than with changes which solely involve the morphological component. As McMahon puts it, “morphology integrates both synchronically and diachronically with the phonology and syntax” (1994:69). I shall first examine the morphologization of phonological rules, and then the morphologization of syntactic structures, before turning to internal morphological change. Morphological change can refer to changes in the structure of lexical items and inflected forms, as well as changes in morphological systems (Trask 1996:102). I will focus mainly on changes in individual constructions, but these may be part of a systemic change.

There is interaction between the phonology and the morphology for instance when regular sound change brings about syncretism, and once distinct case endings fall together by regular sound change, which has happened with the nominative plural, accusative plural, and genitive singular of most consonant-stem nouns in Sanskrit (Joseph 1998:351-352). This is not, however, what is meant by the morphologization of phonological rules. Phonological rules are morphologized when they lose their basis as generalizations about phonological structure and come to describe the behavior of a few morphological elements instead (Anderson 1992:344). Germanic umlaut is a common illustration of the morphologization of phonological rules. The phonetic motivation for the vowel fronting induced by a following high vowel in early German was obscured in later stages of the language, and became an effect associated with the addition of suffixes such as the plural –e. In *Baum/Bäume* and *Haus/Häuser* the use of umlaut is purely morphological, since these items belong to non-umlauting
classes. Thus the umlauting process is no longer phonological in nature, but is rather a morphological process invoked by certain morphological categories (Joseph 1998:358).

Another example of the phonologization of morphological rules is trisyllabic laxing, the phonological process whereby long vowels in Middle English were regularly shortened when followed by two or more syllables. In the Great Vowel Shift, long vowels became dissimilar in quality from their corresponding short vowels. Trisyllabic laxing ceased to apply systematically to new instances of long vowels three or more syllables from the end of a word. The rule of trisyllabic laxing became “morphologized” and applied only to certain words. The old rule is evident in alternations such as sane/sanity, profane/profanity and humane/humanity (Trask 1996:119).

The morphologization of syntactic elements for McMahon (1994) refers exclusively to the reduction of independent words to the status of affixes, or “grammaticalization”.¹ A typical example of grammaticalization cited by McMahon is the formation of the French negative particle pas from the lexical item pas “step” from constructions in which this lexical item was used to emphasize the negative, as in je ne vais un pas “I’m not going a step”.

A typical pathway of morphologization is the phonological and grammatical reduction of postpositional phrases to bound forms and case affixes (Trask 1996:116). Certain Balto-Finnic languages such as Finnish have a postposition kanssa “with”, the

¹ There appears to be some confusion as to whether grammaticalization should be properly defined as the development of an affix from an element in a syntactic construction, or the development of an affix from a lexical item. Most theories seem to regard the position of the lexical item in a syntactic construction as key to the grammaticalization process, yet this is not always explicitly stated in the definition of grammaticalization (Hopper and Traugott 1993, Pagliuca 1994). The McMahon example above involves loss of informational content in the change to a purely relational meaning, but the place of pas in the construction is essential to the development of the grammatical particle.
cognate of which has been reanalyzed in some related languages as a suffix, as in the suffix –ka, of the Kukkosi dialect of Veps. In some dialects of Karelian the formative -kela/-kela has become part of the case system, yielding a new grammatical category of comitative (Anderson 1988:336-337). Another typical pathway of morphologization is the conversion of free pronouns into affixes, either for verbal agreement or for marking possession in noun phrases. Trask describes the development, via cliticization, of agreement markers from free pronouns in Basque, and of possessive suffixes from free possessive pronouns in modern forms of Mongolian (1996:117).

Descriptions of morphologization usually refer to the development of a “grammatical” function, and it is unclear whether this excludes derivational morphology. However, it is not unusual to come across examples of morphologization which produces derivational morphology. Joseph and Janda refer to “numerous parallel transitions from free words to derivational affixes in various Germanic languages”, for example English/German –hood/-heit, -less/-los (1998:197). The adverbial suffix -ment in Romance languages comes from the Latin noun mens “mind”. The stem ment- and ablative case form mente were used together with an adjective to describe the state of mind in which an action was performed, for example clara mente “with a clear mind”. Mente was reinterpreted as referring to the manner in which something is done, rather than the state of mind in which it is done. It was then

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2 Joseph notes that while the noun-plus-free-postposition to noun-plus-case-suffix development is common, this kind of change is not unidirectional: “Nevis (1986), for instance, has demonstrated that in most dialects of Saame (also known as Lappish) an inherited sequence of affixes *-pta-k-ek/n marking abessive has become a clitic word (taga, with variant hago), and more specifically a stressless postposition, while in the Enontekiö dialect, it has progressed further to becoming a nonclitic adverb taga” (1998:354). This case is upheld by Joseph and Janda (1988) as one of the more reliable examples of “demorphologization”. They argue that the rarity of demorphologization in comparison to morphologization is a reflection of the centrality of the morphological component in the grammar.
used with a wider range of adjectives, and came to be regarded as as a grammatical marker expressing adverbial function. (Trask 1996:116). The English adverbial suffix -ly comes from the Old English noun lic “body”. The word lic was compounded with nouns to express the sense of “resembling” and then “having the characteristics of”, for example manlic “manly”. A case inflected form lice was added to adjectives, finally yielding a grammatical affix for making adverbs out of adjectives (Trask 1996:117).

For Anderson, the “morphologization of of syntactic categories” encompasses more than the processes described above. He presents a number of ways of understanding the diachronic relationship of morphology to syntax, the reduction of independent words to the status of affixes being just one of them (Anderson 1980, 1988, 1992). The morphologization of syntactic categories can also be approached through Givón’s dictum “today’s morphology is yesterday’s syntax”. In this theory the internal structure of words is thought to derive from earlier syntactic constructions: “where a morphological pattern is at variance with the synchronic syntax of a language, it is to be interpreted as a relic of the syntax of an earlier age”(Anderson 1992:348).

One of Givón’s “excavations” concerns the Bantu verb phrase, the syntactic order of which is VERB:COMP. This syntactic order predicts a suffixal position for the anaphoric object pronoun. The fact that the pronoun appears as a prefix means that at some earlier stage the syntactic order of the verb phrase must have been COMP:VERB. The pronominalization pattern originated at that earlier stage (1971:394-395). Givón demonstrates that an earlier word order can be reconstructed for English through a number of word-formation processes. English is VERB:COMP, but agentive and gerundive nominalizations of verb phrases containing object nouns
show the opposite syntactic pattern, e.g. lion-killer, city-planner, duck-hunting, babysitting. This compounding pattern must have arisen at a time when the syntax of the verb phrase was COMP:VERB (1971:404-405).

But this approach is not without its difficulties as, according to Anderson, the relation between the morphology and the syntax is seldom so simple and direct. Not all affixes have a relevant source in syntactic material, and even if there is reason to believe that a morphological element does originate as a separate word, its present position may not reflect the earlier position of that word. Developments internal to the morphology “can alter relations of sequence among morphological elements within a word, thus obscuring their bearing on earlier syntactic states of affairs” (1992:348-349).

The two major types of internal morphological change are reanalysis and analogy. Renanalysis occurs when “a word which historically has one particular morphological structure comes to be perceived by speakers as having a second, quite different, structure” (Trask 1996:102). For example, the loss of guma “man” as an independent word led to a folk etymology in which bryd-guma “bridesman” was reformed into bridegroom. Reanalysis can be influenced by existing grammatical items or affixes. English napron and naddre were reanalysed as nouns occurring with the indefinite article an as in “an apron” and “an adder”. Bikini, originally a single morpheme, was reanalysed as consisting of the prefix bi- “two” plus – kini “swimming costume”. –kini was then prefixed with mono- as in monokini “bikini with no top” (Trask 1996:102-104).

Reanalysis can result in the formation of a new affix. The words minimum and miniature are unrelated, but both were reanalysed as having a prefix mini-, which was subsequently used with other words instead of the adjective miniature, for example
**minicar** (Trask 1996:102). A well-known recent example is the reanalysis which produced the suffix *-gate*, denoting “scandal”. The name associated with the original scandal, *Watergate*, was in actual fact the name of an apartment complex. *-gate* was analysed as a suffix and used with other bases to denote fresh scandals such as *Irangate* (a scandal in the 1980s involving the sale of arms to Iran) and a host of others (Joseph 1998:359).

Most examples of reanalysis seem to involve derivational morphology, although there seems to be no reason that the restructuring of inflectional categories should not be regarded as reanalysis. The early Germanic nominal suffix *-es-* was originally nothing more than a stem-forming element, an extension onto a root to form certain neuter noun stems, hence the nominative singular form *lamb-*iz “lamb” versus the nominative plural *lamb-*iz-*a*. After sound changes eliminated the final syllable of the singular and plural forms, *-es-* was reinterpreted as a marker of the plural (Joseph 1998:353).

McMahon’s account of internal morphological change is dominated by analogy, which she describes as an immensely well-documented area of internal morphological change (1994:69). Of the explanation of this type of change McMahon is not so confident, and she echoes Anderson’s remark that “unfortunately theories of such changes are not well developed, and real results or established principles are hard to find” (Anderson 1992:365). A very common example of analogy in morphology is the extension of the English plural *-s* (Trask 1996:105-106, Joseph 1998:352-353, Anderson 1992:367 McMahon 1994:71-72). The Old English plural of *boc* ‘book’ is *bēc*, which, after palatalization and vowel change, should yield modern *beech*. But in Middle English, *bec* was replaced by *bokes*, by analogy with other plural forms in */-(e)s/**.
Anderson describes the basic mechanism of analogy as “the extension of an existing rule to cover new forms”, adding that in many instances this effectively implies the loss of an irregular form. McMahon distinguishes between analogical extension, and analogical levelling. Analogical levelling reduces diversity across paradigms (defined as “a set of inflectional forms with the same stem morpheme”) in languages which organise their inflectional morphology in terms of regular additions of affixes or modifications to the stem (1994:73). Trask uses the term “analogical levelling” in the same way. Levelling in the alternations in the stems of the Old English paradigm for ēōsan “choose” is a common illustration (Trask 1996:108-109; McMahon 1994:73-74):

| Present | cēosan | [z] |
| Past | cēas | [s] |
| Past pl | curon | [r] |
| Past part | gecoren | [r] |

The modern English forms of these are choose, chose, chose and chosen, respectively. The two past-tense forms are not distinguished. Analogical levelling has generalized the [z] alternant throughout the paradigm (Trask 1996:109).

Trask comments that the –s pattern for forming plurals is so widespread and regular that it constitutes a rule of English grammar, but analogy does not always operate on such large scale. “Very often,” he says, “speakers create forms by invoking an analogy with a much smaller number of existing forms, perhaps only a dozen or two, perhaps even only a single form. And such use of analogy is a very common and powerful pathway of language change generally, but most particularly of morphological change” (1996:106). For example, the plural octopi for octopus is often derived on the Latin model of cactus:cacti. But octopus is a Greek word, and the
plural should be *octopodes*. This is called proportional analogy or four-part analogy (ibid.).

Now interestingly, the application of analogy to derivational morphology typically involves only proportional analogy. Clearly, “analogue levelling” is a concept developed with inflectional paradigms in mind. But there is little attempt to apply the notion of analogical extension to derivational morphology. “By an analogical formation,” says Bauer, “will be meant a new formation clearly modelled on one already existing lexeme” (1983:96). He points to coinings such as *cloudscape* and *dreamscape*, by analogy to *landscape*, where –*scape* is interpreted as an affix through new combinations. Bauer comments that this definition of an analogical formation is “much narrower than the one usually implied in diachronic studies” (ibid.).

This statement is worth examining carefully. The analogy that Bauer claims is usually implied in diachronic studies must be that associated with the English plural –*s*, namely analogical extension. In the case of the plural –*s*, the analogical formation is modelled on a number of existing constructions with the –*s* plural. The (inflectional) affix is applied to yet another base which previously formed the plural through different means (umlaut in the case of *bēc* ‘books’). If Bauer had applied analogical extension to derivational morphology, then any neologism or lexical innovation, such as the application of a derivational affix such as feminine –*ess*, to a new base, as in *poetess* or *stewardess*, would be a case of analogy. The difference between this case and the inflectional example of plural –*s* is that *poet* and *steward* did not previously form their feminine through alternative means. The –*s* case of analogy is based on the replacement of one rule by another. This has to do with the difference between inflection and derivation. Inflection is compulsory: there must always be some way of
forming the plural (except for mass nouns) but it is less predictable that a noun will take a feminine suffix.

Bauer’s notion of analogy in word-formation necessarily involves the creation of a new derivational morpheme through reanalysis, not the creation of new derivations. He does not appear to be alone in this view. According to Trask it is in word-formation that “simple analogy of this kind” is common. He too cites the creation of –scape, and gives as another example the suffix –ese: “by analogy with cases like Japan and Japanese, we have recently begun coining a large number of words with the general sense ‘language typical of’, such as journalese, motherese, Americanese, headlines, and officialese (1996:107). The –ese example does not strictly involve the creation of a new affix. But Trask also refers to the increase in productivity of –able in English, and the extension of –able to native bases, for example likeable, lovable, washable, as analogy. This analogy, according to Trask, has now become so widespread that it is effectively a rule of English word-formation (1996:107). The point is that, as always, there is little possibility of drawing a line between analogy and rule-governed formations, but this is as true of derivation as it is of inflection.

In addition to analogical levelling and analogical extension, McMahon identifies a third type of analogy (1994:75). This is “sporadic analogy”, which includes contamination,\(^3\) back-formation and folk etymology. A common characteristic of the phenomena included under “sporadic analogy” by McMahon is that the new creation in each case is modelled on the reanalysis of a single lexical

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\(^3\) Contamination affects words from related semantic fields, such as kinship terms, days of the week, numbers, for example “Russian dev’at’ should have an initial [n] like nine or Russian novem, but has been contaminated by des’at’ ‘ten’” (McMahon 1994:75, Trask 1996:111-112). Another example of contamination is irregardless. Regardless is similar in meaning to irrespective, and therefore the former tends to be changed to irregardless (Trask 1996:111).
item. This corresponds closely to Bauer’s narrow version of analogy in word-formation. Back-formation is, after all, simply the reverse of the creation of a new affix: a base is created through speakers’ recognition of a known affix, rather than the creation of an affix through recognition of a known base. Joseph (1998) relates processes that involve the reanalysis of derivational affixes to other processes that create new words such as clipping and blending.

Finally, with regard to analogy, the literature on analogy includes numerous attempts to discern regular principles and attempts to predict pathways of analogical change, most notably the “laws” and “tendencies” formulated by the Polish linguists Kuryłowicz and Mańczak. I will not reproduce these here as they refer mostly to inflectional morphology. The typology of morphological change set out by Andersen (1980) too, is concerned primarily with inflectional morphology. Andersen classifies morphological change according to the nature of the innovation, the greatest proportion of which he argues is abductive in nature: a speaker infers a system of rules or grammatical structure to account for the norms s/he acquires actively and for other norms which may be current in the speech community (1980:18).

Much has been made of the role that certain surface-structure conditions such as iconicity play in the analogical restructuring of grammars. Structuring by analogy is thought to be heavily disposed towards isomorphism. A theory of morphology which

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4 Or a segment that is falsely recognised as an affix, for example *beg* < *beggar*.

5 While some individual laws could be exemplified by word-formation, for example Kuryłowicz’s second law, “a derived form is reshaped to make it more transparent and especially more similar to the simple forms from which it is derived” (Trask 1996:113), the following generalisations drawn from the laws and tendencies have relevance primarily for inflectional morphology: certain basic unmarked categories such as indicative mood and present tense serve as the model for analogy. Grammatical categories should be clearly marked: longer, more overt and complex markers are favoured. Redundancy, or multiple expression of the same information will tend to be eliminated. Alternation or allomorphy in a paradigm will tend to be eliminated (McMahon 1994:80).
explains morphological change by appealing to iconicity is Natural Morphology. Semantic categories can be expressed or symbolized morphologically with varying degrees of naturalness. Natural Morphology claims that morphological change will tend to produce natural, unmarked, iconic morphology. Proponents of Natural Morphology evaluate changes in the marking of inflectional categories or derivational relationships in terms of how they lead to a better fit with universal iconic principles (Wurzel 1989, McMahon 1994:98-106, Trask 1996:120, Joseph 1998:363). The relative naturalness of derivational relationships is discussed in Dressler (1987) and Dalton-Puffer (1996:55). Briefly, some of the points on a scale of semantic transparency are as follows: affixation with no modification of the affix or base is the most transparent, conversion is less so, and subtractive techniques are the least transparent. Dressler shows that affixation is the most common technique in the languages of the world, and subtractive techniques are the most unusual (1987:105).

Lastly, with regard to morphological change, some mention must be made of borrowing. It is well-established that “the more structural a feature is, the less likely it is to be borrowed” (Haugen 1950:225). Derivational affixes are thus more likely to be borrowed than inflectional (Joseph 1998:361). In Thomason and Kaufman’s “borrowing scale”, casual contact involves the borrowing of content words, but with “more intense contact” derivational affixes may be abstracted from borrowed words and added to the native vocabulary. Only under “strong cultural pressure” will borrowed inflectional categories be attached to native words (1988:74-75).

Trask describes how, despite the fact that Basque has a highly productive suffix -tasun for deriving abstract nouns, as in bakartasun “solitude” (bakar “alone”), edertasun “beauty” (eder “beautiful”) speakers have, in some cases, replaced the native -tasun with the Spanish suffixes -dad and -dura. Many Basques say
*bakardade* for “solitude” and *ederdura* for “beauty”. The suffixes –*dad* and –*dura* were analysed from a number of nouns borrowed from Spanish, the neighbouring and more prestigious language (1996:114). In English, contact with French and has resulted in the large-scale restructuring of the system of derivational morphology. There was obviously sufficient contact for non-native affixes to be analysed from loanwords. Some non-native affixes can be attached to native bases, for example –*(t)ion*, but this is certainly not the case for all non-native affixes. The rate at which this integration took place is debatable (see Dalton-Puffer 1996).

### 2.2. Derivation, inflection and change

The identification of a set of criteria for distinguishing between inflection and derivation has long preoccupied morphologists (Matthews 1991, Anderson 1992, Bauer 1988). One theory of morphological structure which overtly argues against a discrete distinction is Bybee (1985). Bybee is interested in exploring the relationship between inflectional and derivational morphology, or indeed, the transition from the one to the other. Rather than distinguishing between the two, Bybee situates derivational and inflectional morphology on a continuum of formal expression. She rejects formal theories which accord derivation and inflection different representations in the grammar: inflection as part of the syntactic rules, and derivational rules stored in the lexicon (1985:87). From the exposition below, it will become apparent that Bybee’s theory of morphological structure presents a possible framework for a theory of morphological change which incorporates derivational morphology.

Bybee takes Sapir’s classifications of form and meaning as her starting point. Sapir (1921) identifies two basic types of concepts, material and relational, each of which have two subclasses. Material concepts consist of basic concrete concepts,
expressed by “independent words” or “radical elements”, and derivational concepts, expressed by affixing non-radical elements to radical elements or by inner modification of the radical elements. Relational concepts consist of concrete relational concepts and pure relational concepts. Concrete relational concepts differ from derivational concepts in that they indicate or imply relations that transcend the particular word to which they are immediately attached. They are also expressed by affixing non-radical elements to radical elements. Pure relational concepts “serve to relate the concrete elements of the proposition to each other, thus giving it a definite syntactic form”, and are expressed by affixing non-radical elements to radical elements (1921:106-107). Bybee emphasizes that in Sapir’s schema “a given concept may in one language be treated as though it were material, while in another language the same concept appears as relational, making generalization impossible” (1985:7).

Bybee construes this schema as a scale with material content or lexical meaning on the one end and relational content or grammatical meaning on the other. For the possible means of expression, she uses the terms lexical, derivational, inflectional, and syntactic or periphrastic (1985:7). Semantic “elements”, according to Bybee, are combined in various ways in the types of formal expression. Lexical expression is the combination of two or more semantic elements expressed in a single monomorphic lexical item, for example English kill combines the semantics elements of “die” and “cause”. In inflectional expression, semantic elements are expressed as individual formal units, which are in turn bound into a single word. i.e. the units are not independent. Inflectional expression can take the form of affixes

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6 Bybee does not attempt to define “semantic elements”. Sapir refers to the atomic units of meaning variously as “concepts” or “elements”. Bybee is most probably avoiding loaded terms such as “features” or “primitives”. She also uses “categories”, as in grammatical categories. I assume that categories can be broken down into elements, for example the illative in Finnish consists of the elements “inceptiveness” and “motion”.
attached to a stem, or changes to the stem itself. In syntactic or periphrastic
eexpression different semantic elements are expressed by "totally separable and
independent units" i.e. in separate words. For example, come to know is the syntactic
expression of "inchoative" plus "know", while realize is the lexical expression of the
same notion (1985:12).\footnote{Bybee regards Aktionsart as the lexical expression of aspectual distinctions. Aspect is thus not
syntactic by definition in her framework (1985:21).}

These expression types can be arranged on a continuum from the most highly
fused means of expression, lexical expression, to the most loosely joined means of
expression, syntactic or periphrastic expression. Inflectional expression can be located
between these two on the continuum, and derivational expression can be located
between lexical and inflectional expression. Two other major word-formation
processes, compounding and noun incorporation, briefly mentioned by Bybee, can in
turn be placed between lexical and derivational expression on the continuum. The
continuum is represented graphically in Figure 1, where the left-hand arrow is
pointing toward a greater degree of fusion:

Figure 1 The lexical/derivational/inflectional continuum (Bybee 1985:12)

\[
\text{lexical} \quad \rightarrow \quad \text{derivational} \quad \rightarrow \quad \text{inflectional} \quad \rightarrow \quad \text{free grammatical} \quad \rightarrow \quad \text{syntactic}
\]

The proximity of derivational expression to lexical expression in Bybee's continuum
finds support from the fact that a derivational expression can often be substituted by a
lexical item. Bybee's examples of this kind of substitution drawn from English are:
sad for unhappy, pilot for flyer, and size for largeness.
Bybee’s aim is to establish that correspondences between meaning and and its mode of expression are not entirely arbitrary. Two basic principles of organisation can be used to make predictions about expression type. The first of these is semantic relevance: “a meaning element is relevant to another meaning element ... if the semantic content of the first directly affects or modifies the semantic content of the second” (1985:13). In lexical expression, semantic elements have the greatest relevance to each other. For example, if the meaning “through water” is added to the lexical item walk, the result is the lexical item wade. Thus “through water” is obviously quite relevant to the act of walking. The point is made clearer by contrasting “through water” with a qualification such as “on a sunny day”. The latter is expressed syntactically because the weather does not have the same relevance to the act of walking. It is possible to predict the probability of a combination of semantic elements being expressed lexically, derivationally, inflectionally, or syntactically, in that order, according to the degree of relevance that the semantic elements have to one another. Relevance of course depends on “cultural and cognitive salience”.

The opposite principle to relevance is generality. Inflectional affixes must by definition, according to Bybee, be applicable to all stems of the appropriate syntactic and semantic category and must obligatorily occur in the appropriate semantic context. “In order for a morphological process to be so general,” she says, “it must have only minimal semantic content. If a semantic element has high content, i.e. is very specific, it simply will not be applicable to a large number of stems” (1985:17). High relevance to the stem tends to detract from generality of application. A tension thus exists for inflectional morphology: it must be relevant to the base, but not so relevant that it becomes lexicalized, and it must be general enough to apply to all appropriate bases. For example, the causative formations of the Bantu language
Luganda are usually general, as they express the occurrence of an agent, instrument, reason or purpose in the sentence. But some combinations now have an additional idiosyncratic meaning, for example the causative of kùbala “to count or calculate” is kùbaza which means “to multiply” (Bybee 1985:18).

With inflectional expression, the meaning of the category in combination with the lexical stem must be predictable. Derivational affixes, in contrast, have more semantic content and often produce idiosyncratic meanings in combination with different lexical stems. Derivational affixes are consequently less applicable to a wide range of stems: “the various causes of the complete lack of generality among derivational morphemes can be attributed to their meanings” (1985:5). The greater the difference between the meaning of the derived word and the meaning of the base, the greater the likelihood that the affix is derivational.

Bybee postulates that on the basis of relevance and generality, certain categories have a greater likelihood of being expressed inflectionally. She compares the expression of a set of six categories (valency, voice, aspect, tense, mood and agreement) across a representative sample of 50 languages. The six categories can be ranked according to the principle of relevance, in the order given above, with valency at the most relevant end of the scale and agreement at the least relevant end of the scale. The findings are that valency, voice and aspect can be expressed lexically, derivationally and inflectionally. Tense, mood and agreement (in number, person and gender) tend mostly to be expressed inflectionally.¹

Bybee is ultimately interested in predicting which categories are expressed inflectionally. She does not attempt to exhaustively survey derivational morphology

¹ This claim is in danger of being circular, as the categories tense, mood and agreement may have been defined by many of the compilers of the various grammars used in the cross-linguistic sample according to their inflectional status.
But the principles which predict which categories are more likely to be expressed inflectionally, and which derivationally are the same. The graded distinction between inflectional and derivational morphology is determined by the same principles which predict differences among inflectional categories: "Using these same principles, it can be shown that derivational morphology is transitional between lexical and inflectional expression, and that the differences that can be observed between inflectional and derivational expression are just more prominent instances of the differences identifiable among inflectional categories" (1985:82).

The principles of relevance and generality can also predict differences within derivational expression. Derivation which does not change the syntactic category of the word to which it applies, for example valence-changing categories such as causative, is closer to lexical expression because it is highly relevant to the base, and effects substantial changes of meaning. An example is the reversative prefix un-, as in unhook, untie, which quite fundamentally alters the nature of the activity performed. Derivation which changes the syntactic category of the word, while relevant to the base, is more like inflection as it effects less fundamental changes in meaning. For example, English gerundial nominalizations in -ing do not change the nature of the activity. And adverbial -ly, which has "full generality", does not change the meaning of the adjective to which it is attached (1985:82-83).

To return to the point of this excursion, let us consider what insights Bybee's continuum can deliver about change in derivational morphology. Bybee suggests at various points that the lexical-derivational-inflectional continuum has a diachronic dimension. She assumes that inflectional morphemes have their origins in full words that develop a high frequency of use, a process referred to as morphologization and
grammaticalization in section 2.1 (1985:38). These frequent items reduce semantically and phonologically, and eventually become fused with lexical matter contiguous in the syntactic string. In terms of the organisational principles of the continuum, the “semantic reduction” is associated with an increase in generality.

Few other diachronic regularities of the continuum are mentioned, but it is tempting to speculate whether Bybee’s framework might be adapted to describe a range of different types of change. Change from a lexical item to an inflectional morpheme, concomitant with an increase in generality, appears to involve a rightward shift along the continuum (see Figure 1). Yet the lexical items from which inflectional morphemes develop, reduce within syntactic constructions, and so this change might alternatively be described as a change from syntactic expression to inflectional expression, which would involve a leftward shift along the continuum. Directionality aside, what the latter description has in its favour, is that syntactic expression and inflectional expression are situated next to each other on the continuum, whereas lexical expression and syntactic expression are on opposite poles of the continuum.

Whether this debate is important or not is questionable. Perhaps Bybee does not intend the continuum to be applied so precisely to diachrony. But a similar formulation seems to be able to cater for diachronic relationships between derivation and other types of expression. Bybee comments briefly on the origins of derivational morphology: “there is a diachronic relation between compounding and derivational morphology, in that one element of a compound may become a derivational affix if it occurs in a large number of combinations” (1985:106). She cites the example of adverbial –ly which developed from earlier compounds with –like e.g. god-like,

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9 Although there is insufficient evidence to suggest that all inflectional morphemes have such an origin. Much inflectional morphology shows no indication of having been anything else (Roger Lass: personal communication).
child-like, phantom-like. Given that compounding is located next to derivational expression on the continuum, this would seem to be an appropriate pathway for a change from lexical to derivational expression. I am not suggesting that change can only take place between proximal forms of expression. The structure of the continuum simply seems to be able to accommodate a number of commonly observed changes.

It is interesting to compare the adaptation of the continuum above to diachronic events, and grammaticalization theory. In their theory of grammaticalization, Hopper and Traugott distinguish between a “cline of grammaticality” and a “cline of lexicality” (1993:7). The cline of grammaticality represents the following set of changes:

content item > grammatical word > clitic > inflectional affix

And the cline of lexicality represents this set of changes:

item in syntactic phrase > compounding element > derivational affix

The first and most obvious problem with these clines is that they underplay the role of syntax in the development of an inflectional affix. The situation of the “content” item in a syntactic construction is crucial, and often that particular “content item” has a relational or grammatical meaning to begin with, as in the development of a case affix from a postposition. I am concerned here, however, with the cline of lexicality. From this account it would appear that compounding is the only known (internal) source of derivational morphology. The possibility of a derivational affix developing from a lexical item, or a lexical item in a syntactic phrase is not taken into account, and nor is the possibility of a derivational affix evolving from an inflectional affix.
The –ly example of a compounding element → derivational affix is well-known. Some others like it exist in English. As an example of morphologization, Anderson cites the English suffix –hood which forms nouns such as childhood, manhood and neighborhood from other nouns. This suffix was an independent word in Old English (had “state, rank, character”), which could occur as the second element of compounds. According to Anderson “an orginally syntactic collocation developed into a class of compounds …the recurrent second element of these compounds was then further reanalyzed as a derivational affix” (1992:347). But that other well-known example of morphologization which produces a derivational affix, -ment, cannot be said to be formed from a compounding element. Mente would be better described as a lexical item in a syntactic construction.

Sapir seems to permit an unlimited range of movement between the four types of concepts he outlines. He does however single out “that whole class of examples in which the independent word, after passing through the preliminary stage of functioning as the second or qualifying element in a compound, ends up by being a derivational affix pure and simple”. As an example he gives –ful as in teaspoonful (1921:108-109).

Languages which have comparatively little derivational morphology are probably unlikely to yield many examples of this type of change. Unfortunately there is often little hope of tracing the origins of derivational affixes in polysynthetic and agglutinative languages with extensive derivational morphology, for example, Anderson confirms that there is no historical evidence for the origins of any Kwakw’ala (a polysynthetic language) derivational affixes in independent words (1985:25).
Derivational expression is proximal to compounding on the one side of the continuum, and on the opposite side, it is proximal to inflectional expression. Might we then expect derivational affixes to evolve, with increased generality, into inflectional affixes? Bybee has likened the category-changing adverbial –ly to an inflectional affix. On the other hand, can an inflectional affix lose generality, or become semantically more restricted, so that it changes to a derivational expression? These questions are explored by Lass (1993), Ritt (1993) and Dalton-Puffer (1993) with regard to the status of Old English –ian, which is typically described as marking weak class II infinitives in Old English. Lass argues that –ian is definitely derivational from a historical point of view. The majority of these verbs are denominal, and were typically denominal or deadjectival in the older Indo-European languages. What has happened is “the complex desemanticization of a derivational affix to (largely and eventually) a conjugation-class marker” (1993:26). Lass also suggests that –ian may even be taken as a derivational marker within OE itself: “I conclude that class II (even though it does on one level count as a ‘conjugation’ i.e. as inflectional) is in fact something pretty close to a piece of derivational morphology” (1993:32).

Dalton-Puffer (1993) observes that the suffix has moved in both directions: from derivational to inflectional, as Lass describes, then with some phonological incorporation from inflectional to derivational to become the Middle English verb-forming suffix -nen. She speculates that perhaps the infinitive marker –ian comes to embody “verbiness” as such, and “from there it is only a step towards the capacity of conferring ‘verbiness’ onto members of other verb classes” (1985:42). Her conclusion about directionality is:

I think it would be most profitable to regard the relationship between inflection and derivation in terms of a scale where either end serves as a kind of prototypical centre.
Concrete affixes would then occupy different places on that scale and they would be able to move about on it over time. Consequently, they would just change their degree of 'derivationality-inflectionalness' rather than hop from one disjunct set to another. (1993:44).

Infinitive marker $\rightarrow$ verb-forming affix is only one possible pathway between inflection and derivation. Panagl cites a number of cases of change from derivation to inflection (1987:131). The agentive $-lo$ suffix in a number of Indo-European languages serves as a formative of the present participle in Armenian, an active perfect participle in Old Church Slavonic, an active preterite in Russian, and a gerundive in Tocharian. He also discusses the origin of infinitives from the case forms of various verbal nouns (1987:134-135).

My final remark on the diachronic applications of the lexical-derivational-inflectional continuum is that lexicalization (in the sense of the development of a non-transparent, unpredictable meaning of a derivation) could be argued to represent a shift from derivational expression to lexical expression. In this way lexicalization is accounted for in a model which caters for a range of changes between expression types, rather than being treated in word-formation theory as an anomalous development of derivations.\(^\text{10}\)

Further questions arise: can a category-changing derivational morpheme become non-category changing and can the reverse happen? Can compounding produce inflectional morphology? Can a lexical item in syntactic expression produce a derivational affix? Clearly an enormous amount of cross-linguistic research is required before we can even approach answering these questions.

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\(^\text{10}\) Grammaticalization theory understands “lexicalization” as the acquisition of informational content by a grammatical item, for example the use of the preposition *up* as a main verb. These cases are considered to be very rare and are described as “counterexamples” to grammaticalization (Hopper and Traugott 1993:49). If a shift from grammatical to lexical meaning is viewed rather in terms of a shift from inflectional or derivational expression to lexical expression, the phenomenon is less rare.
2.3. Derivational morphology and morphological type

The discussion of changes between types of formal expression in section 2.2. made no reference to the overall morphological structure of individual languages. But as Joseph notes with regard to the morphologization of a postposition into a case-marker: “There can also be variation of a cross-linguistic sort here, in the sense that what is ostensibly the same development, with a postposition becoming a bound element on a nominal, might not lead to a new case form, if the overall ‘cut’ of the language does not permit the analysis of the new form as a case-marked nominal” (Joseph 1998:354). Thus for morphologization to take place, the language must permit case-marking. More broadly, whether a language will permit case-marking depends on its “cut”, which I interpret here as morphological type. In the same way, changes which involve derivational morphology should be examined in relation to the morphological type of the language.

Classical typological systems dating back to the nineteenth century concentrated on the degree of internal complexity of words (the number of formatives that make up a single word) and the transparency of the boundaries between formatives (Anderson 1985:9). Languages with a one-to-one ratio of formatives to words, with every word consisting of a single morpheme were classified as isolating (Trask 1996:125), for example Chinese, Vietnamese, West African languages; languages which form complex words by the juxtaposition of several formatives, with clear boundaries between them, were classified as agglutinating, for example Turkish, Basque, Swahili; and languages with internally complex words not easily segmented into an exhaustive and non-overlapping string of formatives, were classified as inflectional, for example Latin, Russian. To this classification the category polysynthetic was added, mainly to cater for many languages in North America which
were “similar to agglutinative languages in internal complexity and perhaps also segmentability, but with the added feature that some affixal material may represent semantic content of the sort usually reserved for independent stems” (Anderson 1985:9-10). Anderson remarks that while the central examples of these types differ significantly from one another, it is not self-evident that it is possible to classify the world’s languages exhaustively and uniquely on this basis. “In fact,” he adds, “the majority of languages that have been studied to date each show some mixture of features associated with more than one of these types” (1985:10).

Sapir’s revision of this classification system categorises languages according to three different parameters rather than relying on a single dimension (1921:127-156). The first of these is the type of concept represented in a word, described in section 2.2. Sapir observes that all languages have basic concrete concepts, and relational concepts, but derivational concepts and concrete relational concepts are not essential to all languages. Languages can then be classified according to whether they express neither of the latter two concepts, both, or only one. The second dimension, morphological “technique”, is independent of concept type. The four techniques are isolation, agglutination, fusion, and symbolism, which includes internal modifications such as ablaut and consonant change. The third independent dimension is “degree of synthesis”, which “distinguishes analytic, synthetic and polysynthetic types along a more nearly continuous scale of degree of complexity” (Anderson 1985:11).

We can make generalizations about the derivational morphology of a language on the basis of morphological type, such as “isolating or highly analytic languages have no derivational morphology”, and “agglutinating and polysynthetic languages have extensive derivational morphology”, but it is questionable whether morphological type can reveal anything more specific. Note that polysynthetic
languages are actually defined by their range of derivational morphology. Anderson is sceptical about the usefulness of any classifications of a general nature for the description of derivational morphology: “derivational morphology is a domain in which languages generally do not show a consistent typology of the sort sought by nineteenth-century writers on language. Instead, the parameters of interest and importance are relevant in a local sense, to particular word formation processes rather than to whole languages” (1985:56). Languages need not be internally uniform in their word-formation and quite different areas of their vocabularies may show quite different typologies. Anderson points to English as an example of a language with mixed typology.

There is a further aspect, however, in which overall morphological type may be relevant to a study of change in derivational morphology (particularly cross-linguistic studies). This has to do with change which is internal to derivational processes. I refer specifically to increases in productivity through neologising (see section 3). Morphological type will determine the preferred means of neologising in a language. If Language A has more extensive means of derivational expression than Language B (i.e. Language B expresses the same concepts through independent lexical items, compounding, or syntax), Language A will coin more words through affixation than Language B. This is not to say that Language B will not increase its vocabulary, but vocabulary increases will be undertaken through alternative means, for instance borrowing, conversion, compounding, noun incorporation or syntax. Neologising is seldom the subject of comparative studies, yet one might speculate that in languages with extensive derivational morphology, coining new words through affixation is less of a rare event than in languages with more limited derivational morphology. One could go even further and say that derivational processes in
agglutinative or polysynthetic languages are more likely to be highly productive. But
there is not yet sufficient evidence to back up this claim. It may also be true that if a
language has a limited number of derivational processes, these processes stand an
equal chance of being highly productive.

It is often noted that languages may undergo an overall change in
morphological type, for instance, they may become more analytic or more synthetic
(Sapir 1921:136) and this may be associated with change in the system of derivational
morphology. Nineteenth century linguists assumed the following natural directions for
changes in morphological type: isolating languages develop into agglutinating
languages by compounding, and agglutinating languages develop into inflecting
languages by complex phonological changes. Chinese, which was previously
isolating, has developed some suffixes, for example the plural suffix –men, the
completed-action suffix –le, and a number of word-forming suffixes like –li
“power”and –du “degree”(Trask 1996:127). A language can also change its
morphology dramatically through contact with other languages, for example
Armenian, which was strongly inflecting, has become more agglutinating through
centuries of contact with Turkish (1996:128). Trask notes however that change in
morphological type is under no obligation to occur, and there is no reason to suppose
that changes in morphology can proceed in only one direction. (1996:127-128).

Kastovsky (1994a, 1994b) has described the shift of English from a “basically
synthetic/inflectional” to an analytic language due to the almost total loss of
inflectional endings. Since Old English, the morphological system of English has been
generally restructured. In the Germanic period, Old English and Old High German
were both characterized by stem-based morphology, a number of productive word-
based patterns, and ablaut formations (deverbal nouns, deverbal adjectives, deverbal
causatives). In English, word-based inflection and derivation was generalized in the native vocabulary, the ablaut derivatives were almost completely discarded from the lexicon, and verbal ablaut became totally irregular (1994b:149). German, by contrast, still reflects the typical features of an inflectional language (1994b:135-136). German did not undergo as much erosion of final syllables, and consequent loss of inflection. Ablaut patterns were maintained in German.

In Middle English and Early Modern English, extensive borrowing from French and Latin resulted in the introduction of a new stem-based derivational system. A separate stratum of word-formation on a non-native (Neo-Latin) basis was created. The result is what Kastovsky calls a “polystratal” morphological system, as opposed to the original “monostratal” system of Old English (1994a). The split in German is between the nominal system (word-based) and verbal system (stem-based) (1994b). Contact thus changed the nature of the input bases to derivational processes in English. In terms of the derivational morphology itself, contact resulted in the addition of many non-native affixes, and the loss of some native affixes.

Burnley (1992) describes how in Middle English prefixation as a means of word-formation was in retreat. Few of the 34 Old English prefixes continued into Middle English. Prefixes from borrowed words became independent later than Middle English (1992:446-447). Of the forty or so suffixes which existed in Old English, about three-quarters persisted into Middle English. Numerous suffixes were added from foreign sources, some of which were fully assimilated in Middle English (1992:448-449). Burnley also describes changes in other word-formation processes in the transition from Old English to Middle English. Compounding was less fertile than the Old English period, but many Old English types of compounding continued to be productive, and some new types arose (1992:441).
2.4. Derivational categories

Bybee is concerned with a set of grammatical categories the expression of which is primarily inflectional. She takes into account only “the presence or absence of derivational morphology with meanings related to those expressed by inflectional categories” (1985:29). Of the set of categories compared cross-linguistically, Bybee finds that valence, voice and aspect are most likely to be expressed derivationally. As Bybee herself notes, there are many more derivational categories than the ones that appear in her study. To understand the nature of change in derivational morphology, it seems necessary to have some sense of the range of the concepts or categories which can be expressed derivationally. But what would an exhaustive survey of derivational morphology look like, and is it even possible?

Beard (1998) does not attempt to exhaustively survey derivational categories, but his classification of lexical derivation into four types goes beyond a simple classification into category-changing and non-category changing. Featural derivation does not change the category of the underlying base, but operates on the values of inherent features, for example natural gender. Functional derivation adds features to the underlying base, and does not necessarily change the category of the underlying base. Beard argues that this type of derivation is based on case functions, for example bake/bakery (locative), dirt/dirty (genitive), and cut/cutter (instrumental). He claims that “languages with rich morphologies have dozens of such derivations”, but “few if any productive derivational functions fall outside those found in the inflectional system” (1998:59). Transposition involves a simple change of category without functional change, and the reference of the derivation is identical to its base, for example gerundive –ing in walking, -ness in newness, and –ary in budgetary.
Expressive derivation does not change the referential scope of its output, nor the lexical category of the base, for example, diminutive, augmentative, pejorative and affectionate forms (1998:60).

The question is whether such a typology can really cater for all of the concepts that are expressed derivationally, given that certain languages express derivationally what is typically expressed lexically. Sapir describes derivational concepts as a “large floating group”. While the essential relational concepts are universally expressed, the dispensable type of concepts are “sparsely developed in some languages”, and “elaborated with bewildering exuberance in others” (1921:99). The range of derivational morphology of polysynthetic languages is illustrated by Anderson in the case of Kwakw’ala:

some affixes have a content corresponding to that of independent words in other languages ...affixes can in fact be identified whose meanings and functions are similar to members of all major word classes. Nonetheless, these affixes do not simply represent clitic forms of independent words ... Among several hundred suffixes, virtually all are totally dissimilar in form from corresponding free forms. This dissimilarity is reinforced by significant differences in function between affixes and any particular word of the language. (1985:25)

In addition to suffixes which determine syntactic class, and suffixes which express temporal relations, aspect, voice and modality, there are several features which Anderson suggests are unusual from an English point of view, for instance, the application of time relations to nouns as well as verbs\(^\text{11}\). Suffixes do not only correspond to general location (as in functional derivation), but also express concrete locations such as “into the woods”, “at the mouth of the river”, and “on a rock”. There are also suffixes which correspond to most major body parts.

\(^{11}\) Although the prefix ex- in English, as in ex-husband, could be argued to have a temporal aspect.
Malkiel's 1978 survey of derivational categories is more concerned with formal differences in derivation (such as the nature of modification to the stem) than the range of semantic categories which can be expressed derivationally, but he does point out some of the more unusual derivational morphology in Indo-European languages, such as the Russian suffixes for strongly developed anatomical features: nos-át “with a protruding nose” (nos); lob-ást “with a protruding forehead” (lob) (1978:137). These suffixes might be classified as expressive, but accounts of expressive morphology do not include affixes which are so specific, or so restricted in their application (Beard 1998, Zwicky and Pullum 1987).

It seems that derivational categories are, like content items, members of an open class. It is possible to create a new derivational category at any time. Bauer argues that the relationships expressed derivationally are not simple and general, and unlikely to be universal. It is well-known, he points out, that different languages mark different aspects of reality in their structure, and thus “one might expect that such differences would also appear in the derivational systems of languages. Independent of whether the relationships which can be expressed in derivation are universal, it is clear that new derivational markings can be introduced in a language to express new meanings if the need is present” (1983:86). In section 5 I call into question this precondition of “need” for a new derivational affix to be created, but I agree that there is probably not much of a distinction between the search for a set of universal derivational categories and the search for semantic primitives (Wierzbicka 1992).

3. The scope of a theory of change in derivational morphology

Below I list the types of change which involve derivational morphology. I will then indicate which changes are focused in the present study. The developments in (i) to
(vii) are also presented as an outline of the scope of a theory of change in derivational morphology. They concern individual constructions, rather than rearrangements in systems of derivational morphology:

(i) change between derivational expression and other expression types
(ii) creation of new derivational morphology through reanalysis and/or analogy
(iii) fossilization of a derivational affix
(iv) borrowing of a derivational affix
(v) lexicalization of a derivation
(vi) semantic change in a derivational affix
(vii) changes in the productivity of a derivational affix

I have not yet discussed item (vii) on this list. Joseph includes change in the productivity of a derivational affix in his outline of the scope of a theory of morphological change:

Thus it is possible to find change in the form taken by various types of inflectional morphology, such as markings for person, number, gender, agreement, case and the like, as well as the addition or loss or other alteration of such categories and the forms that express them; in the derivational process by which stems are created and modified, and in the degree of productivity shown by these processes; in the morphological status (compound member, clitic, affix, etc.) of particular elements; in the overt or covert relationships among morphological elements, and more generally, in the number and nature of the entries for morphemes and words in the lexicon, etc. (Joseph 1998:352, my emphasis)

Changes in the productivity of a derivational affix are a reflection of the extent of neologising in that affix. The operation of a word-formation rule, or in the case of affixation, the application of an affix to new lexical bases, is seldom regarded as change in itself. But while the semantic category and the form of the affix may stay the same, each new derivation is a diachronic event. This point is made more extensively in chapter 2. Increases or decreases in productivity through neologising can be regarded as change in progress for derivational morphology.

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12 I have not identified neologising as a type of change in itself, as it falls under increases or decreases in productivity.
Changes in productivity drive formal and semantic changes, such as changes in expression type, for example compounding element → derivational affix, associated with an increase in generality, and an increase in productivity. Fossilization, for example, the nominalizing suffix -th in English in words such as warmth and depth, is associated with a decrease in productivity. In the present study I have prioritised the small-scale investigation of changes in productivity, rather than overarching formal and semantic changes in word-formation processes, in an attempt to understand the mechanisms that affect the productivity of an affix. There is a shortage of detailed diachronic studies of individual affixes which measure changes in productivity.

The creation of an affix through reanalysis and/or analogy can take place instantly rather than evolving over long stretches of time. It is extremely difficult, however, to observe this kind of change in a pre-selected representative sample, as it is comparatively rare, and even if some cases were present in a corpus, the possibility of comparing cases across different contexts is very limited. This does not mean that this type of change does not reveal anything about the nature of lexical innovation, and the kind of situations which promote it. The creation of affixes in this way is often described as a more deliberate or creative kind of lexical innovation, different to “normal” lexical innovation, and this raises important questions about the motivations for neologising which will be debated in the course of this study.

I will be extensively concerned with lexicalization, as any study of a derivational affix tends to produce many examples of lexicalized derivations. “Lexicalization” as it is understood here, is the development of an idiosyncratic meaning in a derivation, which differs from the meaning that can usually be predicted from the application of the word-formation rule. This change involves the whole lexical item rather than the affix as such, but given that lexicalization is characteristic
of derivational expression, as suggested in section 2.2., it should be integrated into a
theory of change in derivational morphology.

I will only be concerned with semantic change in affixes insofar as it is related
to lexicalization. I debate whether an accumulation of lexicalized derivations in a
certain affix can bring about semantic changes in that affix, such as the development
of a pejorative meaning, or change from an abstract to a concrete meaning. Of course
generalisation in meaning and specialisation in meaning also constitute changes in the
semantics of an affix, but it is very difficult to draw a dividing line between increases
in productivity, and thus generality, and generalization in the semantics of an affix.

Two of the nominalizing affixes investigated in this study are Latinate: \( -ity \)
and \( -tion \). The status of these suffixes as non-native has implications for neologising
in these affixes, and consequently for their levels of productivity. Thus we shall be
inadvertently concerned with borrowing, but more as it has come to represent social
and stylistic stratification in the system of derivational morphology in English, than
the process of borrowing itself.

4. Modes of Analysis

The theory of change adopted here must explain what drives changes in productivity.
Extralinguistic factors are crucial in the explanation of change, because neologising is
such a socially significant activity. What Joseph says with regard to morphological
change is particularly true for derivational morphology: "any discussion of causes
must make reference to the fact that, as is the case with all types of language change,
the spread of morphological innovations is subject to social factors governing the
evaluation of an innovation by speakers and its adoption by them" (1998:364). I will
not simply make reference to social factors, but treat them as central in the explanation of change.

The appeal to social factors would seem to place this study within the field of sociolinguistics, or, given that it is historical, socio-historical linguistics (Romaine 1982). Since Labov’s 1966 study of variation in New York City speech, “sociolinguistics” has been used as a cover term for variation studies (Romaine 1972:9), rather than a multidisciplinary field which incorporates linguistics, sociology, social anthropology and psychology (Hymes 1974). The variationist approach is central in recent work on historical corpora (Rissanen and Kytö 1993, Nevalainen and Raumolin-Brunberg 1996). However, I do not believe it has successfully been established that a variationist approach is appropriate for derivational morphology. In other words, it is questionable whether a derivational process can have competing variants, in the way that phonological, inflectional and even syntactic features are demonstrated to have. This debate is taken up in chapter 5. Certainly a derivational process such as nominalization can be regarded as a dependent variable, which is conditioned by independent extralinguistic variables. Register is the extralinguistic variable explored in detail in this study (see section 7), and thus register studies (Biber 1988, Biber and Finegan 1989, 1992) have influenced the explanation of change. In addition, I rely on discourse analysis\(^\text{13}\) as a tool for understanding the effect of register on neologising in greater detail.

\(^{13}\) I do not strictly adhere to a particular school of discourse analysis, but the analyses performed in chapters 4 and 5 are influenced by similar analyses in functional grammar (Halliday 1994, Halliday and Martin 1993).
5. Pragmatic and social dimensions of word-formation

Kiefer’s 1998 account of derivational morphology that has pragmatic effects features similar phenomena to Beard’s 1998 account of expressive lexical derivation.\textsuperscript{14}

Besides diminutives, augmentatives and comparatives, Kiefer’s examples include the Japanese beautificational prefix o-, used to make speech softer and more polite, and evidential suffixes such as Turkish –miş, used to convey inference and hearsay. Kiefer argues that derivational processes which affect syntactic structure do not seem to have any direct relevance to pragmatics: “Thus causatives and passives derived from a base word or deverbal nouns can attain pragmatic relevance only via the syntactic structure into which they enter” (1998:275). While I do not entirely disagree with Kiefer, I think it is necessary to point out that studies of the pragmatic effects of different syntactic structures do not take into account the fact that the products of these category-changing word-formation processes are neologisms, particularly the more derivational processes (e.g. English verbal nouns in –tion rather than in –ing), and that this novelty aspect itself has a pragmatic effect.

There are studies, such as Gal (1989), which establish that word-formation is a socially conditioned linguistic feature. The phenomenon emerges most forcefully in situations of language contact and language shift. Gal has chronicled the increasingly restricted use of Hungarian in Oberwart near the Austrian/Hungarian border. She distinguishes four groups of bilingual Hungarian-German speakers on the basis of age,\textsuperscript{14}

\textsuperscript{14} This is somewhat different to Zwicky and Pullum’s notion of expressive morphology, which, unlike “plain morphology”, is extragrammatical. Some examples are expletive infixation (absobloominglutely) and reduplication with deprecative schm- (transformations schmtransformations). Typical characteristics of this kind of morphology are: it has pragmatic effect (expressive, playful or poetic), it applies promiscuously to a range of syntactic categories (bases can also be inflected forms, compound constructions, or syntactic phrases), “imperfect control” (some speakers cannot produce forms at all), alternative forms, and interspeaker variation. Zwicky and Pullum emphasize that they are not suggesting that these properties will never belong to plain morphology, but a phenomenon must have a significant number of the above properties to be classified as expressive morphology (1987:338).
“a rough but adequate surrogate for the social distinctions of occupation, social network and for contrasts in patterns of choice between Hungarian and German” (1989:318). Gal identifies which Hungarian word-formation devices or patterns are retained and which are lost by those speakers who use Hungarian only in a narrow range of contexts (1989:313). Her findings were not those which might be predicted by earlier studies of language shift, which is that the productivity of all word-formation processes decreases with “narrow-users”.

Of the five devices studied by Gal (denominal and deadjectival causative –it, deverbal causative –it, deverbal causative –tet/tat, preverbal compounding, general verbaliser -ol), at least two processes (preverbal compounding and -ol) prompted more lexical innovations from the younger narrow-users than the older users. Gal observes that frequently innovations from the narrow-users in these selected processes often replace another, conventional word-formation process. For example, the conventional preverbal compound felvesz “up + take” for hire, is replaced by elvesz “away + take” (1989:328). Innovations are attributed to the limited lexicons of the narrow-users. They are produced to fill lexical gaps, or “losses elsewhere in the lexicons of these speakers” (1989:330). Many innovations, especially in -ol, occur with borrowed German bases. Restricting norms of usage are absent because the innovations are not censured by the peer group.

In this situation, German is the prestige language but Hungarian is the language of solidarity. Gal concludes that “linguistic creativity during language shift is linked both to cognitive, acquisitional factors that hinge on patterns of use, and to the symbolic significance that speakers create for their languages in response to a political-economic context” (1989:330). The symbolic value of a language mediates not only language choice, but also internal change in the lexicon (1989:315).
Gal’s findings are relevant to the differentiation of word-formation practices across social boundaries in linguistic communities generally. The stratification of derivations is part of the broader stratification of vocabulary. Instead of a choice between two languages, we might talk about a choice between speech styles. The choice can correspond to dichotomies such as oral versus literate, non-standard versus standard, or learned versus non-learned. The notion of the restricted speaker can be generalized to someone without access to written, standard, or learned registers. These are the characteristics of such a speaker:

(i) restricted use of a set of word-formation processes, which show low productivity in the language generally, and may be associated with specialized or learned registers.

(ii) lexical “gaps”, or lack of knowledge of which word-formation process is conventionally used with a base; absence of other idiosyncratic knowledge such as lexicalizations.

(iii) innovation in an alternative word-formation process as a means of accommodating for lexical gaps, i.e. selecting the “wrong” affix out of a range of affixes with a similar function. This is a common source of “malapropisms”. Some better known examples are the substitution of incarnal for incarnate, infinitive for infinite, and prodigious for prodigal by comic characters in Shakespeare’s plays (Schlauch 1987:94).

Non-standard innovations are not only due to a need to fill lexical gaps. Innovation in a certain word-formation process may become markers of a non-standard dialect, even slang. For example, it is possible for North American students to talk about getting some “foodage” or listening to some “tapeage”. Humour is frequently a driving force
behind non-standard word formation. The word for “pop tart” (a jam-filled pastry and popular American breakfast food) in an Athabaskan language of Alaska literally translates as “that which is smeared on the inside with a sticky substance”. The expression was previously used only to refer to canoes which had been smeared with pitch. These examples challenge the usual perception of neologising as “top-down”. In Present Day English, new and vogue words are chiefly associated with influential registers, such as scientific writing and journalism (highbrow and popular). For many languages, there is the additional level of language-planning institutions, the best known probably being the Académie française (see Picone 1996:29-31).

Stratification in vocabulary and in word-formation has played a major role in the history of English, and I will provide a brief summary of some of the developments in the Early Modern English period, when a rapid increase in Latinate vocabulary results in the social stratification of the native and the non-native levels of the vocabulary and the word-formation resources.

Figures based on the Chronological English Dictionary indicate that the Early Modern English period shows the fastest growth in the history of the English vocabulary, especially the latter half of the sixteenth century and the first half of the seventeenth century, and that the dominant source of borrowed lexis was Latin. (Görlach 1991:136, Nevalainen forthcoming, 7.1.1., 7.4.3.1.). This increase can be attributed to, on the one hand, the need to express new ideas in English in fields previously dominated by, Latin, but also the desire to “enrich the rhetorical potential of the vernacular” (Görlach 1991:137-138). According to Nevalainen the increase in synonymy provided “alternative ways of saying the same thing in different registers”

15 Melissa Axelrod, personal communication.
(forthcoming, 7.1.1.). A substantial proportion of the increase in vocabulary was achieved through derivations on a non-native basis. Görlach comments that “an atmosphere favouring linguistic experiments led to redundant production, often on the basis of competing derivational patterns” (1991:138).

One consequence of the flood of new Latin words was that “a language barrier was erected within English in the sixteenth century” and that “the proper use of the Latinate portion of English came to replace knowledge of the classical languages alone as the marker of social class and education” (Görlach 1991:162). The first monolingual dictionaries of English in the seventeenth century, such as Cawdrey’s A Table Alphabeticall (1604), provided glosses for the increasing stock of learned vocabulary, or “hard words”. Nevalainen comments that the pain of learning the learned coinages “must have outweighed the gains for those without the benefit of a classical education” (forthcoming 7.1.1., 7.2.2.). The growing tendency to borrow merely for the sake of affecting an elevated style culminated in the Inkhorn Controversy in the latter half of the sixteenth and early part of the seventeenth century. Many learned borrowings from Latin were seen as inappropriate or superfluous.

The rapid increase of new words in the late sixteenth and early seventeenth centuries is followed by a low during the Restoration and Augustan periods, perhaps as a consequence of prescriptivism (Gorlach 1991:137-138). Around that time loanword criticism is redirected at the affected use of French loans. The social and cultural aspirations associated with French words were satirised by Dryden and other Restoration playwrights (Nevalainen forthcoming 7.4.1.). While Latin became unfashionable in general use in the Restoration period, it continued to be used extensively for technical terms: “As the share of specialist terms in the lexical intake steadily grew in the 18th century, new Latin loans and neo-classical formation became
increasingly associated with technical registers” (Nevalainen forthcoming 4.3.1.).
Thus in Early Modern English the stratification of the vocabulary has less and less to
do with social status and more to do with a learned/non-learned distinction.

6. A revisionist theory of neologising
Existing commentary on the motivations for neologising in linguistics, based on a
radically simplified understanding of society, is essentially pretheoretical. For
instance, Bauer proposes that in order for a neologism to be formed, the referent of
that potential neologism must satisfy the “requirement of existence”, which means
that the referent must exist (and this can include mythological as well as as real-world
existence) (1983:86). This corresponds to an apparently commonsense notion that a
new word is invented when it is necessary to supply a name for a new object or
concept that has entered the speech community. But this point of view assumes
consensus in the community and homogeneity in lexicon, discourse, knowledge, and
world view. Those items and concepts which are named are named because they have
cultural salience for certain speakers. A neologism may introduce a concept as part of
the creation of knowledge in discourse. The commonsense notion of necessity is
predicated on a passive correspondence notion of language which assumes an existing
preconceptual structure, instead of what Halliday and Martin term a “constructivist”
approach, in which “language construes human experience rather than simply
reflecting it” (1993:8).

Even Fleischman, who, in her 1977 study is overtly concerned with cultural
and linguistic factors in word-formation, falls into the same trap as Bauer when she
states that “the neological mechanism is oftentimes triggered by a need or deficiency
in the resources of vocabulary”. Thompson claims that “productive lexical processes
in a language exist for the purpose, as it were, of providing a way to express something for which no word is present in the lexicon” (1974:2). Fleischman qualifies her remarks, however, by observing that this situation prevails “whenever the significatory means which a language has at its disposal at a given moment fall short of the sum total of influences and impulses which require the lexicon to be augmented or certain of its constituent elements to be redeployed” (1977:1), which, although vague, does allow for a fairly broad range of motivations for neologising. The same ideas can be found in Algeo (1991), but with some development:

The need for new words is both pragmatic and esthetic. Pragmatically, when there are new things to talk about, we need new words to name them. Or sometimes we want to talk about old things in a new way. Changes in society, whether material or intellectual, call for new words; and the more intense the social change, the more need we have to name new things or rename old ones. Thus invention, discovery, exploration, war, commerce and revolution all breed neology. But language is not limited to the practical values of conceptualization, communication, management, and cooperation. Language is also a field for play and poetry. (Algeo 1991:14)

First, Algeo admits to the renaming of old concepts, which is a move away from new object-new word arguments. Algeo also points out that word-formation has a poetic as well as a referential function (cf. Jakobson 1964). Examples of this can be found in work on Shakespeare’s word-formation and neologising (Salmon 1987, Garner 1987). I propose a revisionist theory of neologising in which the frequently rehashed observation that new words are coined to name an object which has entered the society is replaced by a notion of neologising as a stylistic choice, heavily conditioned

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16 Riffaterre offers the following anecdote as an illustration of the place of word-formation among literary fashions: “French Symbolist poets used a number of nouns in -ance, so many indeed that these nouns became a trademark of their style; for these poets these nouns were archaisms endowed with the quaint charm of things past. One of the most poetic was assouvisseance and Flaubert made effective use of it; half a century later, when post-Symbolism had popularized this morpheme as a stylistic potential, Flaubert’s archaism was reacted to and admired, now as a neologism.” (1959:165).
by the surrounding discourse. In section 7 I examine the notion of style or register adopted in the present historical study.

7. Word-formation and style, register or text type

In the sociolinguistic literature, external factors which condition linguistic choices are typically “biographical” factors such as age, gender and social class. Social class is a tenuous category to apply to written texts from distant historical periods, and style, or register is thus explored as the extralinguistic variable in the present study. Biographical factors are shown to interact in quite a complicated way with “style”: overt prestige variants tend to be associated with a more formal style, and covert prestige with an informal style (Traugott and Romaine 1985).

The terms style, register, genre, and text type are often used interchangeably. For instance, Stubbs (1996) does not distinguish between genre and text type. In his study texts are classified according to their communicational purpose. He describes the history of “genre” as a traditional category in literary studies, with subcategories such as the short story, novel, play, autobiography, diary, sonnet, epic and fable. New genres continue to be analysed in cultural studies, for example, science fiction, detective fiction, music videos (1996:10-12). For Stubbs, register is a higher-order category which corresponds to a formality/informality distinction. Text type and style are the two external variables in Romaine’s 1982 study of relativization in sixteenth century Middle Scots texts. Romaine treats text type and style as two levels of generality. Two different text types, verse and prose, are each classified into three different styles: official and legal prose, literary (narrative) prose, epistolary prose, courtly or serious verse, moralizing or religious verse, and comic verse.
Biber (1994) uses register as a cover term for language varieties associated with different situations and purposes. He first differentiates between register, a situationally-defined variety, and dialect, a variety associated with different speaker groups. Biber acknowledges that register is a flexible term which can range from extremely high level varieties such as formal versus informal and spoken versus written, to varieties at several intermediate levels. Style has been used in much the same way (1994:34). He maintains that a framework for register studies should clearly distinguish between linguistic and nonlinguistic characterizations of register, and should specify the level of generality of registers, so that register comparisons take place on the same level. With regard to the term genre, Biber notes that literary genres such as essays, novels, short stories and letters are often varieties at an intermediate level of generality, in contrast to the traditional rhetorical modes of discourse: narration, description, exposition, and argumentation. The latter are text distinctions at a high level of generality, corresponding to differences in topic and purpose, and have also been referred to as text types (1994:51).

Biber distinguishes between register markers, “distinctive features found only in particular registers” and common or core linguistic features which occur with differing frequency in most registers. Differences in the relative distribution of common linguistic features typically have functional underpinnings, while the use of specialized register markers is often conventional (1994:33). Typically register differences based on internal or linguistic differences are based on the relative distribution of linguistic features, and the co-occurrence of different sets of features. Using a multidimensional approach, Biber has developed a typology of linguistically defined text types on the basis of co-occurring linguistic features. In early multidimensional studies (Biber 1988, Biber and Finegan 1989) genres are defined
according to external criteria, but text types refers to text categories defined in strictly linguistic terms.

One of the many common linguistic features which differs in frequency across registers is nominal forms (nouns, nominalizations, gerunds). In this study of nominalization, for which register is tested as an extralinguistic variable, I must emphasize that I do not distinguish between registers on the basis of this single feature. I measure the frequency of nominalization in externally defined text types (in the case of HCE) and registers (in the case of ARCHER) and rank these registers according to the frequency of nominalizations. More detail about the corpora and their division into text types and registers is given in chapter 3.
2 Productivity in a diachronic theory of word-formation

1. Introduction

In chapter 1 I suggested that “productivity” should be placed at the heart of a theory of change in word-formation. The productivity of a word-formation process, is, from a diachronic viewpoint, a reflection of the “spread” of that word-formation process, the number of bases to which the rule has generalised, or the number of neologisms that have been formed by means of that process. I argued that change in word-formation can be studied at a microscopic level by observing increases and decreases in productivity. This evidence can then be used to identify the factors which drive change in word-formation. In this chapter I review the definition, treatment and measurement of productivity, and consider how productivity can form part of a theory of change in word-formation.

It is in the arena of synchronic morphology, often of a generative approach, that theories of productivity have chiefly been formulated. Yet we will see that discussions of productivity in synchronic theory are often inadvertently concerned with change. Section 2 examines the notion of productivity in linguistics broadly, and section 3 is concerned with productivity as in relation to derivational morphology. Section 4 examines how synchronic morphology has attempted to provide explanations for levels of productivity in derivational morphology. Section 5 outlines how productivity should be re-cast in a diachronic theory. Section 6 examines synchronic morphologists’ isolation of “factors” which affect the productivity of derivational affixes and considers the place of these “factors” in a diachronic theory of word-formation. I conclude that too much emphasis
has been placed on linguistic or structural factors, and that extralinguistic factors deserve more attention.

2. **Productivity in syntax and productivity in word-formation**

It is instructive to look first at productivity as it is conceived outside of word-formation theory, in order to contextualize the understanding of productivity within word-formation theory. Productivity is, with respect to syntax, often understood to imply the frequency of application of a syntactic rule (Aronoff 1976, Kastovsky 1986:593), or even the frequency of application of a phonological rule (Bauer 1988:57-58). Yet curiously little discussion of productivity in this sense actually exists outside of word-formation¹.

Productivity corresponds to Bybee’s notion of generality of application, discussed in chapter 1. In that framework syntactic expression was the most general and thus the most productive expression type, followed by inflectional expression and then derivational expression. Derivational affixes, which tend to have greater semantic specificity, will be applied to a limited number of bases. Inflectional affixes are simply more generally applicable, or more productive, than derivational affixes. Yet despite her emphasis on a graded distinction between derivation and inflection, Bybee does make a qualitative distinction between the two, when she claims that an inflectional category must by definition be applicable to all stems of the appropriate semantic and syntactic category and must “obligatorily” occur in the appropriate semantic context (1985:17). This characterization of inflectional affixes as “obligatory” differentiates them from

¹ Recently Bybee and Thompson have presented an account of the role of frequency in syntactic change (Bybee and Thompson 1997).
highly productive derivational affixes such as *-ly and *-ness, even though such affixes “show much of the stability, predictability and generality of meaning” that is characteristic of inflectional affixes (Adams 1973:27-28). On the same basis, Aronoff (1976) makes a qualitative distinction between syntax and word-formation:

It is sometimes claimed that productivity is a matter which never enters into the study of syntax. This is not quite true. Compare the two rules Dative movement and Passive. Observe, in the case of the former, that the predicates which permit it, while members of a more or less well-defined semantic class, are not all the members of that class, but some rather reasonably arbitrary selection of them. On the other hand, while there are some transitive verbs which do not allow Passive, the exceptions seem to be principled. One would appear to be justified, therefore, in saying that Passive is much more productive than Dative Movement. Of course, in syntax there are certain types of operations which are immune to questions of productivity. Such rules as Subject-Auxiliary Inversion, which are not optional in any sense of the term, cannot ever be thought of in terms of productivity. In contrast, W[ord] F[ormation] R[ule]s are always optional. (1976:35)

First, let us look at the distinction between “principled” and “arbitrary” exceptions to grammatical rules. An exception is “principled” when it can be predicted from the structural description of the word-formation rule. Variable productivity is associated with “arbitrary” exceptions which cannot be explained with reference to the structural description of the word-formation rule. Syntactic rules can show variable productivity, for example dative movement. Possibly both syntactic rules mentioned here show some variable productivity, considering that passive is “much more” productive than dative movement. Some syntactic rules show no variable productivity, such as subject-auxiliary inversion. These rules are never “optional”. Importantly, word-formation rules are “always optional”. They can never be fully productive, and will always have arbitrary exceptions.

Bauer’s understanding of productivity in syntax differs from Aronoff’s in that he is concerned with syntax in the abstract. Bauer does not refer to specific syntactic rules
such as passive or dative movement. Productivity in syntax according to Bauer is the
notion of infinite creativity, so central to generative grammar: “Productivity is one of the
defining features of human language, and is that property of language which allows a
native speaker to produce an infinitely large number of sentences” (Bauer 1983:63).
Bauer overtly contends that productivity in word-formation is the same phenomenon as
productivity in syntax, and that the only difference is a quantitative one. In his view,
forming new words is like forming new sentences, only the number of new sentences that
can be formed is greater, due to the fact that there are more elements (lexical items)
which can potentially be combined. Bauer is thus unlikely to regard, as Aronoff does,
word-formation rules as “always optional”.

The optional nature of word-formation rules observed by Aronoff is what led
Chomsky to advocate the “lexicalist hypothesis” in his 1970 article Remarks on
Nominalization. Chomsky’s main assumption is that a grammar consists of a base of
context-free syntactic rules and a separate lexicon. In the lexicon are lexical entries, each
with its system of specified selectional and subcategorization features. In Remarks
Chomsky compares gerundive nominalizations in –ing to derived nominalizations in
-(t)ion or -ness. The productivity of derived nominals is “much more restricted” and “the
semantic relations between the associated proposition and the derived nominal are quite
varied and idiosyncratic” (1970:188). Chomsky recommends that within the generative
framework, the treatment of rules for nominals as “some extension of the
transformational apparatus” (the transformationalist position) is appropriate for
gerundive nominals and the direct accommodation of nominals in the lexicon (the
lexicalist position) is appropriate for derived nominals.
Bauer is critical of what he calls Chomsky’s “all-or-nothing” approach. He acknowledges that Chomsky does at one point allow for a compromise position in which some items are catered for by the transformationalist position and others are catered for by the lexicalist position, but maintains that in practice Chomsky favours the lexicalist position. Bauer argues that much of the irregularity and unpredictable semantics of derivations encountered by Chomsky can be understood as the result of lexicalization processes. Furthermore, these irregularities do not extend to regular derivations with predictable semantics such as adjectivals in –able and agent nouns in –er in English (1983:81).

Aronoff believes that Remarks “presents a new theory of syntax, in which all of derivational morphology is isolated and removed from the syntax; it is instead dealt with in an expanded lexicon, by a separate component of the grammar” (1976:6). Aronoff was the first to attempt to characterize the notion of the word-formation rule, and to build on Halle’s (1973) proposal that a word-formation component should be added to the lexicon of generative grammar (Romaine 1983:177-178).

Inflectional rules “fall outside” the lexicon because they represent knowledge not of particular words, “but rather of the form taken by words as a consequence of the syntactic structure in which they appear” (Anderson 1992:184). Rules of derivation, according to Anderson are rules that “operate within the lexicon to relate stems … to one another, and to create new lexical stems on the basis of existing ones when required” (1992:184). Word-formation rules specify “partially systematic relations” among lexical items rather than carrying out active derivation (1992:186). For example, the following forms in –able have no verbal bases: affable, capable, credible, eligible, possible,
*potable, probable.* Word-formation rules will specify an analysis of these existing forms which describes a relationship between *-able* and other derivations in *-able* which do have verbal bases.

Aronoff aims to develop a theory of morphology integrated into “the general framework of transformational grammar” (1976:1) as outlined in such works as Chomsky (1965) and Chomsky and Halle (1968). Aronoff makes it clear that he presupposes Chomsky’s “lexicalist hypothesis”. In doing so, he is sympathetic to Chomsky’s suggestion that some word-formation rules be dealt with in the lexicon and some not. Fully productive rules such as the derivation of adverbs in *-ly* from almost any adjective do not need to be listed in the lexicon (Aronoff 1976:37).

Despite the observed qualitative distinction between productivity in syntax and inflectional morphology on the one hand and productivity in derivational morphology on the other, productivity in derivational morphology is consistently expected to fit a syntactic model of productivity. The productivity of derivational morphology is a phenomenon usually construed in negative terms: productivity in word-formation is a *lack* of productivity. Productivity is viewed by theoretical morphologists as a “problem” (Anderson 1992:197), “a fact which any theory of word-formation will be called upon to explain” (Bauer 1983:63) and “one of the central mysteries of derivational morphology” (Aronoff 1976:35). Aronoff’s labelling of the lack of productivity of derivational morphology as a “mystery” seems at odds with his finding that word-formation rules are “always optional”. It is precisely because derivational morphology is partially productive, or “semi-productive”, that morphologists have felt obliged to tackle the subject and provide explanations for apparent anomalies. I shall argue that this presentation of a
productivity that is somehow problematic has much to do with the construction of the concept of productivity itself. Against this backdrop then, let us review attempts to define productivity with respect to word-formation and derivational morphology.

3. Productivity in derivational morphology

Certainly the most work on productivity in derivational morphology in recent years has been undertaken by Harald Baayen and colleagues (Baayen and Lieber 1991, Baayen 1992, Baayen 1993, Baayen and Renouf 1996). Baayen’s quantitative approach to productivity\(^2\) has involved the development of statistical measures of productivity for large modern corpora of English and Dutch. The growth rate for an individual word-formation process can be calculated as a ratio of the number of hapax legomena in that affix (words that only occur once in the corpus, i.e. types that have a token frequency of 1) to the total number of tokens in that affix. This growth rate has been referred to as the “statistical readiness with which a word-formation rule is used to coin or understand new words” (Baayen and Renouf 1996:73). It predicts the rate at which new words in that affix will appear if the sample is enlarged. Typically, processes with a high value for this measure will have low numbers of words with high token frequencies. The growth rate for individual word-formation processes can then be compared to the growth rate of the vocabulary, which is the ratio of hapax legomena in the corpus to the total number of tokens in the corpus. Baayen also takes into account the total number of types in an

\(^2\) As opposed to a qualitative approach, which refers to the study of restrictions on the productivity of a word-formation process (Aronoff and Anshen 1998:224). For Kastovsky productivity encompasses both the “rule scope (number and type of constraints imposed on the rule)” and “application rate (frequency of actual application of the rule in performance as measured in terms of the number of attested formations)” (1986:585).
individual word-formation process, which is an indication of the “extent of the use” of the word-formation rule (Baayen and Lieber 1991:819). A sense of the “global productivity” of a word-formation process is obtained by plotting the growth rate of that process against the total number of types for that process.

This brief description does not do justice to the prolific and complex nature of Baayen’s work on productivity, and we will have occasion to return to these methods of measuring productivity in section 5. The following discussion is chiefly concerned with the early work of Aronoff and Bauer. It is these works that inform most of the assumptions made about productivity in word-formation. Matthews describes the chapter on productivity in Aronoff (1976) as “brief but seminal” (1991:81).

In the 1980s Bauer defined productivity in the following terms: “a morphological process can be said to be more or less productive according to the number of new words which it is used to form” (1983:100, 1988:57). Even an affix which has a relatively small range of possible input bases can be highly productive if it occurs with a high number of these bases (1988:69). In these early versions of productivity, in which productivity is not expressed quantitatively, affixes are often described as “productive”, “semi-productive” or “non-productive”. Bauer maintains however that productivity is “not all or nothing, but a matter of more or less” (1988: 57).³

Certain assumptions underlying Bauer’s definition are not immediately obvious. Whereas Baayen’s measure of the potential of a process to coin new words referred to a designated corpus, we can only conclude that Bauer is referring to the number of new

³ A recent, “informal” definition of productivity in derivational morphology is fundamentally the same: “the extent to which a particular affix is likely to be used in the production of new words in the language”. In this view too, productivity is a “probabilistic continuum that predicts the use of potential words” (Aronoff and Anshen 1998:242).
words a morphological process can form at that moment, by the linguist or an idealized speaker. My point is that temporal and spatial location are built into Bauer’s notion of productivity. Every statement of productivity begs the question: frequency when and frequency where? This is confirmed by Bauer who observes that “when we say nothing of the time, the implication is that we are speaking of productivity in 1980s English” (1988:61). For Bauer, productivity is an intrinsically synchronic phenomenon: “We cannot sensibly talk about the productivity of a morphological process without implicitly talking about the time at which this process is productive” (ibid.). Bauer laments the fact that no numbers can be attached to “the degree of productivity” (1988:59), although he claims that it is possible to measure “generalisation” (the extent to which a morphological process is analysable in the established words of a language) by counting the number of occurrences of a word-formation process, “in some reasonably representative word-list”. This is a reflection of the past productivity of the affix. These occurrences could also be represented as a percentage of the potential bases available for the process (1988:61-62).

Aronoff’s account shows subtle but important differences from Bauer. In an attempt to cater for the apparently anomalous fact that the existing number of words in a word-formation rule is a typically a subset of the number of possible words for a word-formation rule, Aronoff proposes an index of productivity for every word-formation rule which can be arrived at by comparing the ratio of “possible” to “actually listed words” (1976:36).^4

^4 Baayen and Lieber (1991) attempt to calculate this ratio for affixes in the CELEX lexical database. They point out that for highly productive processes the number of possible words tends towards infinity, and so the index tends toward zero. Thus these highly productive processes actually receive lower values on this index than relatively unproductive processes.
This index, too, is a synchronic measure of the potential of a process to form new words. The difference is that Aronoff proposes to use existing or “actually listed” words to arrive at this expression of synchronic productivity, whereas Bauer has described the use of existing words as a measure of past productivity (generalisation). Bauer has carefully avoided referring to actually listed or existing forms in connection with potential productivity. He regards the appearance of a new word as a “diachronic fact”, and observations concerning the emergence of a lexeme are diachronic statements. He warns that there is a danger in “confusing productivity from a diachronic point of view with productivity seen purely synchronically” (1983:64). The idea that existing words will reflect the productivity of different periods has been variously expressed: “Any discussion of new formations as such means the abandonment of the strict distinction between history and the present moment” (Adams 1973:5). But Aronoff (1976) believes that judgements of synchronic productivity made on the basis of “actually listed” words, will correspond to speaker intuitions:

Speakers of a language have intuitions about productivity. I will give an example of what I mean by this. Consider again the two suffixes #ness and +ity\(^5\) attached to bases of the form Xive. Take one word out of the class Xive, perceptive, and form with the suffixes the two words perceptiveness and perceptivity. Present these two words to native speakers of English and they will almost invariably say that though both words are possible, one of them, perceptiveness, sounds “better”. Perceptivity is said to be “awkward or “fancy”. The same will hold for any other pair of words of the form Xiveness and Xivity, provided that neither is already a common word. Clearly, speakers are not using lists when they give these answers; rather, they are showing evidence of having direct access to an intuition. This intuition seems to express the notion “likelihood of being a word of the speaker’s active vocabulary”, a notion equivalent to productivity. (1976:37)

It is on the basis of existing words that Aronoff identifies factors which affect productivity. Yet, because of his equation of productivity based on existing words with

\(^5\) The use of # and + are adopted from Chomsky and Halle (1968); # indicates a word boundary and + indicates a morpheme boundary.
productivity based on speaker intuitions, he is able to refer to speaker intuitions as further evidence of his identification of the factors affecting productivity.

4. Productivity in synchronic theories of word-formation

Aronoff's theory of productivity involves the identification of "specific properties" which "characteristically distinguish productive from non-productive WFRs" (1976:35). Aronoff approaches this study of the restrictions on productivity through a case study of the two English noun-forming suffixes -ness and -ity. It is highly significant that he chose to base his study of productivity on these two. The thinking behind this move is that by contrasting the performance of two morphosyntactically identical affixes, it will be possible to identify the "factors" responsible for the differential distribution of the two affixes, which are then equated with the set of general factors affecting productivity. This is a false equation. Such a comparison might identify the factors responsible for the differential distribution of -ness and -ity, but it tells us little about the productivity of deadjectival nominalization per se, or even the factors which condition the distribution of other rival affixes.

Let us look more closely now at Aronoff's isolation of the properties which supposedly distinguish productive from non-productive word-formation rules. One of his contentions is that, although the suffixes are morphosyntactically identical, they are variably productive according to the morphology of the base to which they attach. For instance, one statement is that #ness is more productive than +ity with adjectives ending in -ive (perceptive), but with adjectives ending in -ile (servile), the number of forms in -ility exceeds those in -ileness (1976:36). Aronoff also claims that #ness attaches more
productively to bases of the form *Xous* than does *+ity*. He cites a preference for *fabulousness* over *fabulosity* and *dubiousness* over *dubiosity*. And *famosity*, he claims, is impossible (1976:37).

Certain combinations of bases and affixes are associated with phonological readjustment rules, specified in the lexical entry. For example, for *Xous + ity*, “stress shifts to the syllable preceding the affix (*luminous/luminosity*) and this syllable is always lax, due to the effect of the rule of trisyllabic shortening” (1976:40). The second phonological adjustment rule for this combination is that *+ity* sometimes triggers the loss of *-ous*, as in *voracious á voracity*. Aronoff terms this the rule of truncation, or R1. The application of R1 is determined by individual words, or, it is “lexically governed”. The meaning of this is that

R1 … does not take place in all the words which meet the conditions for it. Thus we have *various/variety*, but *curious/curiosity* … nor do we find free variation in individual words, for a given base, R1 will either always or never apply … in the large majority of cases it is impossible to predict from any general property of a word whether it will undergo R1 or not (1976: 40).

Aronoff then proceeds to illustrate how, with a given base, sometimes a general property can determine the application of R1. So in bases of the form X*V*icious (where V is a vowel), the vowel governs the application of R1: *thordacious á mordacity; precocious á precocity* but not *specious á *specity*, in which case there is no nominalization in *-ity* at all. With bases in Xulous, however, the application of R1 is not governed by such a general property: *credulous á credulity* but not *nebulous á *nebulity*.

According to Aronoff, the presence or absence of such a general property plays an important role in productivity: “The lexical government of R1 has a great effect on the

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6 Aronoff neglects to mention that *specious* is the only one of this set of examples that has two syllables rather than three.
productivity of +ity. Evidence for this assertion is the fact that when R1 is not governed by the individual word but by a more general factor ... the productivity of +ity increases”.

He predicts: “Since the operation of R1 is lexically governed in +ity derivatives of words of the class Xulous and is not lexically governed in +ity derivatives of words of the class Xacious, we expect +ity to be more productive with the latter base than with the former.” (1976:41). The prediction is apparently confirmed by two tables based on Walker’s *Rhyming Dictionary* (1936), one of adjectives in Xacious and their derived nominals in Xacity, and another of adjectives in Xulous and their derived nominals in Xulosity or Xulity.

Table 1 Adjectives in Xacious and their nominalizations (Aronoff: 1976:41)

| Bibacious | * | Pugnacious | Pugnacity |
| Efficacious | * | Pertinacious | Pertinacity |
| Inefficacious | * | Minacious | Minacity |
| Perspicacious | Perspicacity | Capacious | Capacity |
| Pervicacious | Pervicacity | Rapacious | Rapacity |
| Procacious | Procacity | Spacious | * |
| Edacious | Edacity | Feracious | Feracity |
| Mendacious | Mendacity | Veracious | Veracity |
| Mordacious | Mordacity | Gracious | * |
| Audacious | Audacity | Voracious | Voracity |
| Sagacious | Sagacity | Vivacious | * |
| Fugacious | Fugacity | Sequacious | * |
| Salacious | Salacity | Loquacious | Loquacity |
| Tenacious | Tenacity | |
| Fumacious | * | |
| Contumacious | * | |

Table 2: Adjectives in Xulous and their nominalizations (Aronoff 1976:42)

| Fabulous | Fabulosity | Glandulous | * |
| Sebulous | * | Pendulous | * |
| Nebulous | Nebulosity | Undulous | * |
| Noctambulous | * | Nodulous | * |
| Bibulous | * | Scrofulous | * |
| Tubulous | * | Solidingulous | * |
| Miraculous | * | Orgulous | * |
Twenty-nine adjectives in *Xacious* yield twenty-one nominals in *Xacity*. Fifty-two adjectives in *Xulous* yield eight corresponding nominals, four in *Xulosity* and four in *Xulity*. Aronoff concludes: “We see that when there is a condition on the application of R1 which is not lexically determined, there are very few gaps in the +ity paradigm. On the contrary, where we have no such general condition, we have many gaps and very few actually occurring nominals” (1976:42).

Extending this analysis, Aronoff contrasts +ity and #ness: “It should be noted that with #ness, which is generally more productive than +ity, there is no rule corresponding to R1 and hence no need for any lexical marking at all. It is reasonable to conjecture that this fact in some way contributes to the greater productivity of #ness” (1978: 42). The extraordinary nature of the lists that Aronoff has used demands scrutiny. I checked these lists against another more conventional dictionary (Chambers), and the Oxford English Dictionary (OED). Chambers was missing 1 of the adjectives from Table 1 (fumacious) and 16 of the adjectives from Table 2. Even the OED does not have 3 of the adjectives

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7 Second edition unless stated otherwise.
from Table 2 (sebulous, craculous, torulous). While it is entirely possible through borrowing and Latinate coining to find nominalizations without bases, surely it is in most cases necessary, in order for nominalization to occur, for speakers to be familiar with the base and to have motive or opportunity to nominalize these expressions? The point is that there are extralinguistic factors which promote the nominalization, and the creation of the concept, before phonological factors can be invoked as inhibiting the nominalization.

Aronoff presents phonological adjustment rules here as the primary cause of lack of productivity. It is in this way that linguistic factors such as phonological adjustment have been privileged in theories of productivity. Yet Aronoff extrapolates from these “results”, based on lists from Walker’s Rhyming Dictionary, to model speaker intuitions:

The connection between lexical marking and lack of productivity is not surprising when we look at the matter from a broader, social perspective. A speaker confronted with an adjective of the form Xacious, from which he wishes to form a nominal in *ity*, will know that the nominal must be Xacity and will therefore not hesitate to use it. When faced, however, with an adjective in Xulous, he is in a quandary. Which is correct, Xulity or Xulosity. He doesn’t know, though he does know that one of the forms is correct, that there is no free variation. In order to avoid the stigma of using the wrong word, he simply uses neither and falls back on the trusty Xness form. (1976:42)

In this exposition I have focused on selected morphological and phonological factors believed by Aronoff to restrict productivity. A more comprehensive survey of these factors can be found in section 6. The aim of this exercise was to point out that Aronoff’s use of a specialised lexicon to model speakers’ intuitions about the productivity of a process, and to establish the properties determining productivity, is inappropriate. He has used a dictionary (of a specialised sort even) to determine “existing” words, isolated the factors which apparently govern productivity on the basis of these, and then “explained” speakers’ intuitions by appealing to these factors.
Subsequent studies of productivity undertaken by Aronoff and others have, more appropriately, used speakers to model speakers’ intuitions. Aronoff (1980), using data from Aronoff and Schvaneveldt (1978), investigates the attachment of two rival affixes to bases of the same morphological class. Again, the rival suffixes are -ness and -ity. Subjects are asked to judge the acceptability of three different sets of items of the form Xiveness and Xivity: “actual words” (from Webster’s Collegiate dictionary), “possible words” (only the base Xive has occurred in the language) and “non-words” (not even the base form has occurred). Aronoff’s hypothesis that non-existent words in Xiveness will be judged to be actual words more often than non-existent words in Xivity is confirmed. The same approach is taken by Anshen and Aronoff (1989) in their attempt to measure the comparative productivity of -ness and -ity on -ive bases (passiveness vs. passivity) and -ible bases (reasonableness vs. reasonability) as well as the comparative productivity of -al and -ary on -ion bases (*visional vs. visionary). Anshen and Aronoff (1989) also list the “existing words” of these forms found in Walker’s Rhyming Dictionary. Romaine (1983) has made a similar comparison. She also conducts an experimental study of speaker intuitions in which she asks speakers whether specific bases take both -ness and -ity, -ness only, -ity only, or neither affix. She compares the results with those obtained from a dictionary, using the same bases. She finds significant discrepancies between the two measures.

Yet even the “experimental” method has its problems. First, the situation is quite an artificial one. The bases given to subjects are still selected, usually from dictionaries, or made up. Romaine points out that “people are never in a situation where they have to apply WFRs to random word lists” (1983:199). Second, much of the experimental
method involves judgements of acceptability. Acceptability judgements of grammaticality are the “common analytical tool of the modern syntactician”, but in word-formation they are “blocked by speakers’ reluctance to deal with new words, even though they are well formed, and by the variation in productivity of word-formation rules” (Aronoff 1980:72). Bauer (1983) maintains that acceptability judgements can be applied to word-formation, despite the fact that forms such as certainty and serviceability which are assigned asterisks by Marchand (1969:312-315) are accepted by others (Geddie 1968 in Bauer). The lack of acceptability of neologisms is often regarded as a “performance phenomenon” (Kastovsky 1986:586). But word-formation poses a real problem for generative theory in terms of distinguishing between competence and performance. According to Adams “the incongruence of grammaticality and acceptability ... is far greater where words are concerned than where sentences are concerned” (1973:6). It is notoriously difficult to judge the acceptability of words, because a word, unlike a sentence, is an addition to an inventory. As soon as items are listed in an inventory, it is very difficult to maintain homogeneity, i.e. for everyone to have the same inventory.

Of course, it is not a new observation that generative theory has ignored social variation, and this is not only true of word-formation theory. But the practice of delimiting a mental lexicon for the idealised speaker is bound to be dramatically less successful than delimiting a grammar, given even greater variation in the lexicons of speakers than their grammars. Even if one were to pursue this aim, derived items would certainly be at the periphery of the mental lexicon rather than part of the core vocabulary. Romaine has stated this at length:
The variability of speaker intuitions in grammatical markers is more or less a commonplace. Yet, the significance of this fact has not made a major impact on linguistic methodology and theory. It would appear that there is an analogy between the gradience in grammaticality of syntactic structures, which are the output of rules of syntax, and that of the products of WFRs. Even though the boundaries of the lexicon, the meaning of words, and grammar, are fuzzy rather than sharp, there is still an important respect in which the rules of syntax and word formation differ. There is no comparable list of the existent sentences in a language, not are there frequency dictionaries of sentences ... If we consult dictionaries such as the OED, it shouldn’t be surprising that there are major discrepancies between the totality of possibilities recorded there and the intuitions of individual speakers. (Romaine 1983:185-186)

According to Romaine, Matthews has correctly described the problem as “how to decide where to draw the line between what is in the lexicon and what is not” (Matthews in Romaine 1983:197). As pointed out in chapter 1, the lexicon and therefore derivation, can vary dramatically with social status, education, literacy. Another important observation about acceptability made by Adams is that “we may observe that words not usable in everyday language will very easily be found acceptable in specialized spheres” (1973:198).

In conclusion, the assumption of a common lexicon is not a harmless idealisation, in that it has far-reaching consequences for the subsequent identification of factors affecting productivity, as we have seen with Aronoff (1976). A more heterogenous lexicon might be more likely to highlight other factors. I will no longer be concerned with the methodology of synchronic productivity, but the issues raised in this review are relevant to the measurement of change in productivity.

5. Productivity in a diachronic theory of word-formation

Because synchronic morphology is frequently concerned with labelling processes as productive or non-productive for Present Day English, this judgement becomes associated
with an affix with the result that few are able to imagine a historical situation in which the said process was something otherwise. Levels of productivity may fluctuate considerably in the “lifespan” of an affix.

The historical evidence available in a compendious work on English word-formation such as Marchand (1969) - billed as “synchronic-diachronic” - is invaluable, and Marchand comments extensively on the productivity of individual English word-formation processes over time. Some idea of the fortunes of individual affixes in English can be gleaned from general histories of the lexis and word-formation (Nevalainen forthcoming, Kastovsky 1992a, Burnley 1992), and of course historical studies of individual affixes (Gadde 1910, Fleischman 1978, Panagl 1987, Riddle 1985, Romaine 1985). Few historical studies however, are quantificational. Of those that are, some use dictionaries as their source of data (Cannon 1988) and others make use of corpora (Romaine 1985, Dalton-Puffer 1996, Baayen and Renouf 1996). In the following section I review historical studies of word-formation that have attempted to empirically measure changing levels of productivity.

Aronoff (1980) briefly considers how productivity can be approached from a diachronic perspective:

At first glance, it seems more plausible to think of productivity in purely diachronic terms. According to this view, one would say that Rule A is more productive than Rule B if more words formed according to Rule A enter the language in the time between two given points T₁ and T₂. Thus, since productivity is computed by comparing points in the history of a language, it is a diachronic matter. (Aronoff 1980:71-72)

7 The tape-recorded material in Gal (1989) technically constitutes a spoken corpus. The study has a diachronic aspect, insofar as subjects are age-graded, but Gal does not compare material from different historical periods in the way that these studies do. Not all corpus studies are quantificational. Panagl (1987) documents the decline in productivity of the supine in classical Latin on an author-by-author basis, but he does not count any of the occurrences of this process.
Setting aside for the moment the comparison between two rules, I will note that this is a common perception of how changes in productivity should be recorded: by counting the number of “words” (I assume this is types) formed by a process at two different points and comparing these totals. Once again, it is necessary to specify for what sample of the language productivity is measured at $T_1$ and $T_2$, and whether this is taken from a dictionary or a corpus.

5.1. The diachronic study of productivity in dictionaries and corpora

In section 4 it was observed that any study of existing words is invariably diachronic, as these words will all have been formed in different historical periods. This aspect is surfaced by Anshen and Aronoff (1989) who do not simply count the existing words they find in the pairs Xiveness/Xivity, Xibleness/Xibility, and Xional/Xionary in Walker’s Rhyming Dictionary, but take the process a step further by arranging these items in chronological order according to their first citation dates in the OED. The items are then grouped into four time periods (pre-1600, 1600-1699, 1700-1799, and 1800-1899), allowing Anshen and Aronoff to make judgements about changes in productivity of the various patterns. The authors make the following observation about the “dictionary” section of their study: “It can be argued that the absolute number of words of a given form existing in English need not reflect the current productivity of an affix. It is possible to have a large number of words of a given form, none of which have been coined in the last three centuries” (1989:199). They thus arrive at a similar conclusion to Romaine who maintains that “looking at dictionaries gives us a retrospective idea of productivity”

The varied ages of existing words may not render dictionaries suitable for synchronic studies, but the possibility of translating these ages into a picture of change, demonstrated above, may make dictionaries suitable for the diachronic study of word-formation. “Dictionary” here implies the OED, as such a study could not be conducted without first citation dates. An alternative approach is to compare the numbers of new words formed by a word-formation process in dictionaries from different periods. Cannon (1998) analyses lexical innovation in late twentieth century English by comparing the numbers of new words identified by Merriam-Webster’s Third New International Dictionary of the English Language (1961), its addenda sections (1966-81), The Barnhart Dictionary of New English (1973) and The Second Barnhart Dictionary of New English (1978).

Yet the use of dictionaries for the study of changes in productivity is problematic for a number of reasons. Some objections are practical in nature, for instance, it is well known that entries in the OED are not equally representative of all historical periods, or of all text types. The project has, in the past, placed emphasis on primarily literary works (Nevalainen forthcoming 7.2.1., Schäfer 1989). According to Nevalainen, “the OED is far from being an ideal data base for chronological statistics”. More fundamental objections have to do with perceptions about what words should be recorded by a dictionary. Baayen and Renouf (1996) dispute whether dictionaries are a reliable source for studying morphological productivity:

Dictionaries cannot aim at exhaustiveness in the domain of productive word formation, as it is commercially unattractive to print thousands of words the meaning of which is
immediately familiar with the basic meaning of productive affixes ... counts based on dictionaries will often seriously underestimate the extent to which affixes are productive” (1996:69-70).

They take to task Cannon (1988) because he calls attention to loanwords, clippings, blendings, and Greek and Latin-based compounding, rather than rule-governed, productive word-formation. Cannon’s counts have lead him to conclude that in Present Day English the suffix –ly is no longer productive, because “only a handful of neologisms occur in his dictionary-derived database of neologisms”. This unwarranted conclusion, according to Baayen and Renouf, has been arrived at through a bias in the compilation of these new word dictionaries. Their own corpus-based study demonstrates strong productivity for the suffix in Present Day English. Writers on word-formation have frequently relied on material gathered from newspapers and magazines. Says Adams: “I believe that such transient coinages are valuable in helping us - and occasionally surprising us - when the dictionary lets us down” (1973: viii).

Arguments which militate against the use of a dictionary, coupled with developments in corpus linguistics which make it possible to search ever larger electronic text databases for derivations, suggest that historical corpora are preferable to dictionaries as a resource for the diachronic study of word-formation. Furthermore, corpora, unlike dictionaries, allow the linguist to observe the influence of contextual factors on the production of a derivation or the selection of one of a set of rival affixes. Each new derivation can be located within its surrounding text, where the role of that derivation in creating meaning in the sentence and broader discourse can be explored.

The likeliest criticism of the use of historical corpora to study changes in word-formation is that existing historical corpora are too small. Whereas a grammatical
construction may occur comparatively frequently even in a small corpus, considerably fewer instances of a word-formation process can be expected for the same amount of text. The further back one goes in time, the less material is available, and historical corpora of Old English will be the most limited in terms of size. Even for periods in which the collection of a large number of texts is theoretically possible, this project is far behind the compilation of electronic text databases for Modern English. But these are entirely practical limitations. In principle, there is nothing to stop the creation of a comparatively large historical corpus. The effects of a relatively small size historical corpus on the results obtained for a study of derivation must however be considered carefully. In chapter 3 I point out the ways in which this problem has been taken into account in the present study, although it cannot be entirely overcome without a considerable increase in corpus size.

Romaine (1985) compares the type frequency of nominalizations in the suffixes -ness and -ity in three different translations of the same text, Boethius' De Consolatione Philosophiae: Alfred (880), Chaucer (1380) and Elizabeth (1593). Thus this corpus is very small and carefully controlled in terms of content. Dalton-Puffer (1996) is a comprehensive account of suffixation (abstract noun suffixes, agent noun suffixes, adjectival suffixes and verbal suffixes) in the Middle English section of the Helsinki Corpus of English Texts. Dalton-Puffer gives the token and type frequencies for each suffix for three Middle English subperiods (1150-1250; 1250-1350; 1350-1420). A comparison of these subperiods can reflect changes in the use of a suffix over the three centuries. Dalton-Puffer compares the productivity of native English suffixes to Latinate
suffixes, in order to assess the extent of the influence of French on Middle English
derivational morphology.

Baayen and Renouf (1996) is a study of lexical innovation in five English
derivational affixes (-ly, -ness, -ity, un- and in-) over four years (1989–1992) in a British
newspaper corpus (the Times) of 80 million words. The study differs from Baayen’s
earlier work in that it is made explicit that productivity is measured over a period of time:
“the large amounts of electronic text becoming available allow us to compare our
probabilistic productivity measures with the rate at which neologisms actually appear
over a period of time in written discourse” (1996:70).

The authors count the number of new types in a given affix for each month over
40 months. It is important to note that only words that have not appeared in the corpus
before are counted. If this data is graphically represented, the resulting curve is the
increase in new types as a function of sampling time. This is different to comparing the
type frequency of an affix at different intervals, where types occurring in an earlier period
may be re-counted. Now it is unlikely that the “new types” counted in the first few
months are reflective of new types formed in 1989, as all the types from previous
centuries must initially register. Only later months are likely to show numbers of new
types that are representative of new words coined at that time. Baayen and Renouf
therefore present only the rate (per month) at which new types are formed at the end of
the four-year period, or, after 80 million words have been sampled. It is not certain
therefore to what extent this should really be considered a diachronic study, as Baayen

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9 This is likely to happen fairly quickly in such a large corpus. The curve of the graph for all the affixes tends to level
out at roughly 10 months or 20 million tokens.
and Renouf are not strictly concerned with comparing productivity at different times. Such as comparison might be possible, but, for the reasons given above, the earlier months of the study would yield unreliable results.\textsuperscript{10}

Baayen’s standard degree of productivity is calculated for each affix, on the basis of hapaxes in that affix for the whole corpus. The number of hapaxes in each affix is compared to the number of hapaxes in the entire corpus, as well as total number of types in that affix. Large numbers of hapaxes indicate that an affix is productive: “unproductive morphological categories will be characterised by a preponderance of high frequency types, by low numbers of low frequency types, and by very few, if any, hapax legomena” (Baayen and Renouf 1996:74). This survey presents a range of possible approaches to the measurement of change in productivity. The most suitable approach for the present corpus-based study is considered in chapter 3.

5.2. Interpreting the results of a diachronic corpus-based study

If measurements indicate an increase or decrease in productivity, there are certain issues that may stand in the way of an interpretation of this result. I have identified three, which are discussed in sections 5.2.1, 5.2.2, and 5.3.3. The first is that in a historical study, there is no way of verifying whether an item that shows up as new, is in fact a new word in the language. There are no speaker in itions to appeal to, insofar as those are ever reliable. There are also differences of opinion about what should be considered a “new” word or neologism. Second, we have no way of knowing whether a new type in a

\textsuperscript{10} At one point Baayen and Renouf compare the number of neologisms (hapax legomena which do not occur in a dictionary) produced in -ness in 1989 to number of those produced in 1992 (1996:77). The increase suggests that the suffix has become more productive over the four years.
historical period may be lexicalized, i.e. whether it has developed an idiosyncratic meaning. Third, for words with Latinate affixes, there is no way of distinguishing between a loanword and a derivation in a Latinate affix. One could appeal to a dictionary for assistance with all three of these problems, but the inaccuracies of that method have already been mentioned.

5.2.1. What's new?

Baayen and Renouf, whose concerns are essentially synchronic, have ways of ascertaining whether the derivations that their measurements indicate are new, are neologisms in the speech community. They define neologisms as “words that are new to the language community and that have not yet been registered in dictionaries and corpus-based word lists” (1996:75). Most of the items in their study which do not appear in a dictionary (Webster's third new international dictionary of the English language 1961/1981) are among the hapax legomena or very low frequency types. The presence of such items is a feature of the size of their corpus: “For small samples, nearly all hapax legomena are listed in comprehensive dictionaries. As the size of the sample increases, however, the number of low-frequency words that are not listed in dictionaries increases, notably so among the hapax legomena” (1996:75).

Baayen and Renouf later conclude that their criterion for determining neologisms is too strict, given that what is selected by a dictionary is to a large extent arbitrary. Furthermore, they fundamentally understand a neologism to be a new word in a speaker’s mental lexicon, which makes even hapaxes alone too strong a definition of neologisms: “It is highly unlikely,” say the authors, “that words occurring with a frequency of 1 in 80
million that happen to be mentioned in some dictionary are available in the mental lexicons of language users” (1996:77). The possibility of checking whether a word is a neologism according to a dictionary is not an option in a historical study, given that the neologisms of much earlier periods will obviously have been present in dictionaries for some time. Dalton-Puffer asks:

even an unsophisticated, unstatistical method of pin-pointing neologisms presents us with a severe heuristic problem in historical linguistics. How are we going to tell what was new (at what point in time?) in the absence of synchronic dictionaries, let alone speaker judgements? (Dalton-Puffer1996:220).

The only recourse for a historical study is to check hapax legomena or new types against first citation dates in the OED, although these may not always be accurate. Historical studies are thus much more reliant on other means of identifying lexical innovations. Counting hapax legomena seems optimal, if these are indeed the most likely items to be neologisms. There are two problems with this method. The one is that hapax legomena are not especially revealing for small corpora, given that the smaller the corpus, the more types will be hapax legomena. The other is that Baayen and Renouf are content to view the number of hapaxes as an indication of the number of neologisms, because they are not interested in neologisms which may be used several times in the same text by the same author. It is “ephemeral” rather than these “deliberate” neologisms that provide a better indication of productivity. This distinction is questioned in section 6.3.2.

5.2.2. Transparency and lexicalization

Baayen and Renouf refer to Eve Clark’s observation that “established, conventional words already in the lexicon” are “liable to display all the idiosyncracies of forms and meanings that accrue over time” (Clark 1993:128, Baayen and Renouf 1996:92). This is
an additional reason that analyses of morphological productivity should ideally proceed on the basis of lexical innovations only. Panagl (1987) would like to disregard lexicalizations in his analysis of productivity in a historical corpus (the “qualitative criterion”). A historical study which has not effectively separated the new derivations of a particular time period from earlier derivations, is liable to contain among those earlier words, types which have lexicalized, or developed idiosyncratic meanings, for example *witness*. Furthermore, there are no intuitions which may be appealed to, no way of ascertaining whether types are lexicalized at the time they appear in the study.

Furthermore, Baayen and Renouf note that “idiosyncracies of meaning are not restricted to existing words. The intentional foregrounding often underlying the use of semi-productive word-formation may give rise to lexical innovations that are not fully regular” (1996: 92-93). This is exemplified in chapter 6, which features several action nominalizations which show a lexicalized “object” meaning close to the time at which they are coined, for example *exudation*. I shall not be taking steps to exclude lexicalizations from the measurement of productivity in this study, but in chapter 6 the proportion of lexicalized types for each affix is given. The possible distortions threatened by lexicalizations are already catered for by the use of type frequency rather than token frequency, as some lexicalizations have very high token frequencies, for example *highness*, as in “your highness”.

5.2.3. Transparency and borrowing

Synchronic studies never take loanwords into account when measuring productivity. They are generally trying to represent what is in a speaker’s mental lexicon. But historical
studies are often concerned with periods in which there was a huge influx of loanwords: Middle English typically, but also Early Modern English (Nevalainen forthcoming, Coleman 1995). Thus the productivity of an affix at that time might be skewed by the presence of high numbers of loanwords in that affix. Dalton-Puffer (1996) is concerned with a period for which she cannot assume that derivations in Latinate affixes are productive instances of the use of that affix. She therefore distinguishes between derivations which are “word-based” i.e. the base is an independent word in Middle English (as attested by the Middle English Dictionary) or “stem-based” i.e. the base is not an independent word in Middle English and may occur as a stem of other words (1996:210). This allows her to determine the extent to which Latinate affixes were actually productive in Middle English. A difficulty with this method is that the base, through an accident of record, could be attested after the derivation, even if this is not the true sequence of events:

In many cases, if not in most, it is most likely that the derived noun was borrowed first, often as a technical term. What is crucial, though, is that even though chronologically speaking the noun was not always derived from ‘its’ verb or adjective in Middle English, after a certain point, it could have been. As soon as a pattern had acquired a particular strength in terms of a type/token frequency of derivatives and their possible bases in the language, these formations became analysable on a Middle English basis and could lead to new formations on a Middle English basis (1996: 210-211).

In the present study, I will not attempt to verify whether the base is an independent word in Early Modern English. There are several reasons for this. First, since the study occurs after the Middle English period, I will assume that the word-formation system has stabilised, and that most Latinate affixes can be used productively. Second, Early Modern English is characterised by extensive Latinate coining or neologising, what Marchand
terms “word-formation on a Neo-Latin basis”. This can take place, according to Marchand, at four different “degrees of foreignness” (1969:7):

1) the word is a complete alien in Neo-Latin form, for example, *nectarium*.
2) the word has English form but is not analysable as a composite on an English basis, for example, *amorphous, pugilist*.
3) the combination is derived on a Neo-Latin basis but the elements can be analysed as allomorphs of English morphemes, for example, *scientist*.
4) two non-native elements are combined on a native basis, for example, *hyper-sensitive*.

I will treat the products of these four kinds of derivation as innovations in this study. Among nominalizing processes, the Latinate suffix *-ity* is particularly known for word-formation on a Latinate basis. According to Marchand, *catholicity* and *historicity* are not historically derived from their corresponding adjectives (1969:217), and the deliberate learned loans or inkhorn terms *loquacity* and *verbosity* are further examples (Nevalainen forthcoming 7.2.4.). -(t)ion too, occasionally derives a substantive from, as Marchand puts it, “a verb which exists only virtually”. Examples are *sanitation* 1848 (the verb *sanitate* is back-derived from it, first recorded 1882), *sedimentation* (1874) “deposition of a sediment” (apparently no verb recorded), and *automation* 1954 (the verb *automate* is less common) (1969:261).

Third, much as with the Middle English dictionary, first attestation dates can be misleading. Many English derivations have French counterparts. The OED is unclear, and frequently inaccurate, as to whether these derivations occur first in English or in French.
For example, Marchand notes that the first French attestation of *exportation* is 1734, and the first English attestation is 1610 (1969:259). If the derivation appears in French, the OED tends to suggest that the item is a French loanword. Even if the OED’s dating is accurate, it is not inconceivable that the derivations could have arisen independently in the two languages. In short, there is really no way of telling.

The OED is in fact much more likely to attribute an item to a French or Latin borrowing than Marchand is, as the following illustrates: “How far the English words are influenced by French patterns is often difficult to tell, as most of the words exist both in Latin and French ... *exportation* of which the OED says is ‘ad. French’ is certainly not French as the French word is first recorded in 1734 whereas the English word is dated back to 1610. The pattern is either L. *exportatio*, or *exportation* is an English derivative” (Marchand 1969: 259). As far as Marchand is concerned, “the derivational character of the English substantives is not impaired by the fact that almost every word has a Latin or a French counterpart as well”(1969: 259).

6. The explanation of productivity

The discussion up to this point has been concerned with the measurement of changes in productivity. But once change has been identified, it requires explanation. Synchronic theory has been extensively concerned with explaining the level of productivity shown by a word-formation process by appealing to “factors” which affect, limit or restrict productivity. It stands to reason that the forces which have determined the productivity of a process at a certain time will also be those that drive changes in productivity. The
“factors” identified by synchronic theorists, and their relation to each other, should however be evaluated carefully before such an assumption is put into practice. Section 6.1. interrogates this notion of “factors”, and sections 6.2. and 6.3. address individual linguistic and extralinguistic factors.

6.1. Factors affecting productivity

I reproduce Dalton-Puffer’s extended list of “a certain repertoire of concepts”:
phonological/syntactic characteristics, frequency\textsuperscript{11}, generalisedness, semantic coherence, analysability, transparency, creativity, neologisms, lexicalization, blocking, paradigmatic competition, social convention, contextual appropriateness, usefulness to language community (1994:248-249, 1996:216). Dalton-Puffer notes that these concepts “tend to recur even though they may be attributed different weight in different frameworks”, and all are “treated as factors which are said to condition the productivity of a morphological rule” (1996:216). Dalton-Puffer (1996) discusses four of these factors herself (contextual appropriateness, frequency, analysability/transparency, and creativity) and I shall return to her observations in the course of this discussion.

Bauer (1983) employs the term “restrictions”. This term implies the identification of bases which are potential exceptions to a word-formation rule. However Bauer does not use the term so selectively: all of the influences on productivity that he identifies are “restrictions”. I will argue that while the use of “restriction” is judicious in some places, restrictive factors must be distinguished from factors which are the primary motivators of lexical innovation.

\textsuperscript{11} I have treated frequency as a measure of productivity rather than a factor affecting productivity.
Dalton-Puffer’s comment about the different weighting accorded to different factors will be taken up in this account. Observations such as Aronoff’s that the productivity of a WFR is the result of a “complex interplay of factors” (1976:37) are common, but there is little discussion of how these factors actually do work together, or how they should be weighted in relation to each other. This is of particular relevance to the distinction between linguistic (or structural) and extralinguistic factors. These points were made made in section 4, with regard to Aronoff’s privileging of phonological adjustment rules as the reason for lack of productivity.

An implicit understanding of many accounts of structural factors affecting productivity, is that once these structural factors have been accounted for, a rule is “productive” (if used in an absolute sense) or “fully productive”. This is reflected by statements such as “the degree of productivity of a WFR is inversely proportional to the amount and type of competence restrictions on that rule” (Booij in Romaine 1983:196). Panagl cautions that the term “productivity” should be used carefully, because it “excludes, when taken seriously and in its strict sense, the existence of any limiting restrictions other than those set up by the particular category” (1987:128).

“Consequently,” explains Panagl, “if in a given language one designates as productive the type of word-formation called ‘deverbal agent noun’ then one should, in principle, be able to derive from any verb a noun which describes the occasional, habitual, or professional performer of the relevant action” (ibid.).

This is the European structuralist approach to morphological productivity which is heavily criticised by Baayen and Renouf:
degrees of productivity are claimed to reflect the extent to which phonological, morphological and semantic restrictions constrain the input domain of an affix … Within the input domain defined by these restrictions, an affix is claimed to be absolutely productive … the restrictions defining the input domain of an affix are viewed as originating from lexical competence and define the productivity of a rule. Any remaining quantitative variation is declared to be a matter of performance (1996:87).

Baayen and Renouf observe that without additional qualifications of the restrictive weight of these phonological, morphological and semantic restrictions the claim that the degree of productivity and the number of restrictions are inversely related is “simply vacuous” (1996:87). For example, a restriction against adverbial -ly attaching to adjectives in -ly (*sillyly) is unlikely to rule out large numbers of complex words, given the small number of adjective bases in -ly. Furthermore, it is strictly only possible to adopt the position using a potential or synchronic notion of productivity, where the prediction cannot be tested. In a study that examines existing words (and is thus diachronic) it is possible to observe that for most processes, a relatively small proportion of the possible input bases are derived.

6.2. Linguistic factors

Structural or linguistic factors which affect productivity are typically conceived of in terms of restrictions on the bases which, “because of some aspect of their make-up, do not provide a suitable input to a given rule of word-formation” (Bauer 1983:88). That aspect, for Bauer, can be phonological, morphological, lexical or semantic.

6.2.1. Phonological factors

Phonological adjustments on derivations in -ity, believed by Aronoff to limit the productivity of derivations in -ity as opposed to -ness, were examined in section 4. For
the most part these readjustment rules were unpredictable from any general property or “lexically governed”. Bauer (1983) regards these phonological adjustments as restrictions on the base which are “lexical” rather than “phonological” in nature. Besides truncation, the phonological adjustments undergone by bases derived in –ity are consonantal changes (the change from /k/ to /s/ as in opaque → opacity, authentic → authenticity), vowel shifts (ei → æ in sane/sanity, ai → i in divine/divinity) and stress shifts (módal → modálity, visible → visibility, válid → validity). All native, and the majority of foreign suffixes can be attached without causing the main stress of the stem to shift, but “in order to use –ity formations, a speaker must control this part of the morphophonemics of English” (1983:189) Such changes are not triggered by -ness. In choosing neologisms, speakers prefer the base word to be transparent, or intact, in the derived form (Cutler 1981:74).12

Restrictions that Bauer does classify as phonological have to do with the complementary distribution of rival morphological variants according to phonological segments in the base (cf. Romaine 1983:188). For example, the French diminutive suffix -ette is not added to bases ending in /t/ or /d/, with occasional exceptions such as ridette ‘little wrinkle’ and bastidette ‘little countryhouse’ (Hasselrot in Bauer 1983:88-89). As for case studies which use –ness and –ity, these restrictions on the base influence the selection of one affix over another, not the exclusion of that base from derivation altogether. One of Bauer’s examples, adverbial –ly, which appears on –y adjectival bases

12 Cutler notes however that there are degrees of transparency, and that “differences in the size of individual speakers’ vocabularies can effect differences in where the recognition point occurs in particular words and hence in the relative acceptability of neologistic derivations from that word” (1981:76).

Bauer’s illustration of how suprasegmental restrictions can limit the number of bases that undergo certain processes is the infixation of expletives for emphasis in English, for example, absobloominlutely and imfuckingpossible. These infixes usually occur “immediately before the syllable of the base that bears the lexical stress”, which makes licketyfuckingsplit possible, but not *lickfuckingetysplit. Such infixes cannot be added to words which are stressed on the first syllable and do not have a subsequent subsidiary stress, for example solid and criminal (1983:90).\(^{13}\)

The question for a diachronic theory is, can phonological adjustments explain why the productivity of a word-formation process might change? This would involve tracking the timepath of a phonological change, and then observing whether this change has affected the number of derivations in that process. Ideally, this could be measured, if the phonological change has had a sufficient impact on the productivity of that process. For example, when trisyllabic laxing became a lexically governed morphological process rather than part of the phonology of English, restricted to certain words such as sanity, profanity and humanity (Trask 1996:119), what was the effect on the productivity of –ity?

### 6.2.2. Morphological factors

The fact that certain Latinate affixes attach only to Latinate bases, for example –ion, which, unlike –ment (cf. wonderment, settlement, amazement) applies only to verb stems in the Latinate class, is

\(^{13}\) Bauer observes that “it is also unusual that the words produced by this infixation never seem to become established; this seems to be because of the high productivity of the process” (1983: 90). Yet what does Bauer consider “established” here? Is this a social notion? If so, to what extent are expletives ever “established”?\)
a fact which must be accommodated by synchronic morphological theory (Anderson 1992:195-196). Aronoff (1976) assigns an abstract feature of \( \pm \) latinate to bases. According to Romaine, the “bipartite structure of English morphology” necessitates “what some have called stratal or diacritic features to account for co-occurrence restrictions on native and non-native morphemes. The inclusion of the features \([-\text{Latinate}] \) or \([-\text{French}] \) and \([-\text{learned}] \) is required in the lexical entry for \(-\text{ity} \) because non-native suffixes may be attached only to non-native morphemes” (Romaine 1983:195). The suffix \(-\text{ness} \), by contrast, can attach to \(-\text{latinate} \) and \(+\text{latinate} \) bases. \(-\text{hood} \) is one of the few native affixes that can only attach to \(-\text{latinate} \) bases. The last morpheme in a string determines the feature marking. It is \(-\text{able} \) therefore that is responsible for the attachment of \(-\text{ity} \) in readability (Aronoff 1976:52).

Bauer observes that this feature is not necessarily etymological, and has to a certain extent been artificially created by synchrony, in that “words etymologically derived from Latin can be accepted as native”, for example \textit{state} in \textit{statehood}. Bauer comments that “exactly what factors influence this diachronic shift in status is not clear” (1983:91). According to Anderson there is a consensus among morphologists that “at least some (synchronously) arbitrary subdivisions of the lexicon such as that between ‘latinate’ and ‘non-latinate’ forms in English must be countenanced” (1992:196).

In an empirical historical study it is unnecessary to arbitrarily subdivide the lexicon in this way. At any one stage it possible to quantify how many (etymologically) Latinate and (etymologically) native bases attach to native and Latinate affixes. Dalton-

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13 According to Aronoff, \(-\text{hood} \), though restricted to native bases, attaches to words which are etymologically Latinate as in \textit{priesthood}, \textit{statehood} (1976:51). He further states that monomorphic words tend to move into the native classification. Aronoff reasons, circularly, that because \(-\text{hood} \) is restricted to native bases, any Latinate base the suffix is found with (by implication they can only be monomorphs) will have “moved into the native classification”. It is hard to know how Aronoff might analyse formations like \textit{apprenticehood}, \textit{bachelorhood}, or \textit{creaturehood}.
Puffer (1996) counts the number of hybridisations in her corpus, dividing them into two kinds: Latinate base + Germanic affix; Germanic base + Latinate affix.

In section 4 I noted that Aronoff’s observations that adjectives ending in –ile are more likely to nominalize in –ity and adjectives ending in –ive are more likely to nominalize in –ness. He later adds that –ity prefers –ic, -al, -id and -able (1976:53). These morphological factors are, according to Aronoff, of a “positive” nature. In other words, they are not restrictions, and state tendencies. Some factors which have to do with the morphological shape are negative, however, for instance, –ness doesn’t attach to adjectives in –ate, -ant or -ent (*decentness, *aberrantness, *profligateness). The diachronic exploration of these tendencies by Anshen and Aronoff (1989), has already been described.

6.2.3. Semantic factors

As an example of a semantic feature which is a “necessary prerequisite to a process of word-formation”, Bauer points to the requirement that compounded –ed adjectives such as blue-eyed must only modify nouns which inalienably possess the base of the adjectives. Thus *two-carred man is impossible (Bauer 1983:93-94). Another example cited by Bauer of semantic restrictions on the bases that can occur with a word-formation process is the suffix –ship, which is added to bases which denote a “position, office or title”.

This latter example is interesting, because it means that the semantic specificity of an affix can be understood as a semantic restriction on the type of base that can occur with that affix. The implication is that it is not often, perhaps never, possible to distinguish
between the semantic description of a word-formation rule, and semantic restrictions on
the bases that serve as inputs to that rule. I would argue that this is because the word-
formation process is inherently limited in productivity. In frameworks such as Bybee
(1985), the semantic specificity of a derivational affix automatically means that its
productivity will be more limited.

Riddle (1985) argues that studies of –ness and –ity have ignored the extent to
which semantics affects the productivity of these suffixes. She traces the historical
development of different semantics in these supposedly synonymous affixes. The
outcome is that –ness has an “attribute” meaning and –ity has an abstract or concrete
“entity” meaning. In chapter 5 and 6 I establish that Riddle’s claim cannot be supported
by the evidence. If Riddle’s account was correct, however, then a quantificational
diachronic study should be able to demonstrate changes in the productivity of those
affixes that are associated with their semantic changes. The case described by Matthews
(1991), also described in chapter 6, is more promising: decreases in the productivity of
negative prefixes such as in- are linked to the pejoration of derivations such as inhuman.

6.2.4. Syntactic factors

A good example of a syntactic restriction on bases is the highly productive German
nominalizing suffix –ung, which shows a syntactical restriction to transitive verbs as a
base for derivation (Panagl 1987:130). Syntactic restrictions on the base are another area
in which it is difficult or impossible in a synchronic theory to make a distinction between
the description of the word-formation rule and restrictions on the bases that can occur
with that word-formation rule. Bauer defines a syntactic restriction as “one affecting the
rules, configurations and/or features which lead to the generation of a string made up of a
base and an affix" (1983: 84). Anderson observes that the position that "many non-
occuring words can be blocked by conditions that are systematic parts of the Structural
Description of a rule" is not a very interesting one, if there are no constraints on the
inventory of features that can be appealed to in this way (1992:196). 14

With regard to syntactic restrictions on the base, the topic of “affix generalization”
should be mentioned. This refers to the range of syntactic categories with which an affix
can occur. This is often associated with morphological restrictions (section 6.2.2.), in that
the final morpheme of a base is often an indication of the syntactic category of that base.
Baayen and Renouf (1996) find, in their corpus-based study, varying degrees of
productivity according to the kind of base that forms the input to a rule. Adverbial -ly
attaches to a wide range of bases, simplex and complex, and can even attach to a phrase,
e.g. real-worldly. The suffix -ness shows the highest number of innovations on
monomorphemic basewords (leftiness, pinkness), adjectives in -y are close behind
(crabiness, nerdiness) and nominalizations in -ness are weakly attested for -ish, -less,
un-, over-, past participle bases in -ed and present participle bases in -ing
(demandingness). For nominalizations in -ity, adjectives in -able show the highest degree
doing productivity, followed by monomorphemic base words (anality, concavity). Of the
negative prefixes, un- attaches most frequently to adjectives (and among these most
frequently to past participles in -ed e.g. unmanned), occasionally to nominals
(unconclusion), but less often to verbs (unsay). Baayen and Renouf conclude however
that “affix generalisation” has more to do with the semantics of an affix than its overall
productivity. For instance, un- is less likely to attach to verbs because “many actions are

14 Anderson is really referring to the assignment of a ± latinate feature here. Syntactic restrictions (such as
those on -ing) are probably easier to state as far as Anderson is concerned.
15 There are however only four cases of affix generalization for -ly: broadly, whyly, onely, oftenly
(Baayen and Renouf 1996:83).
irreversible in everyday context of use”, and the “abstract semantics” of –ness and –ity favour affix generalisation. In chapter 5 I will take note of the range of syntactic categories with which –ness and –ity occur, but I have not been able to establish whether this range has changed over time.

6.2.5. Competition between affixes

I have pointed out that studies such as Aronoff (1976) which base their theories of productivity on competing affixes such as –ness and –ity do not necessarily identify independent factors affecting productivity, but only factors that promote the use of one affix over another. The competition between the affixes itself is not typically identified as a factor which may limit productivity. Matthews, however, observes with regard to the noun-forming suffixes -th and -ness: “the competition is almost wholly an encroachment of the productive domain on the domain of the unproductive” (1991:70).

Van Marle (1986) takes the view that the “range of action” of morphological categories is of a “paradigmatically determined nature”. Not only are morphological processes subject to restrictions which relate to the phonological, morphological or semantic properties of the words constituting the base, but the “range” of a morphological process may also be determined by its position in relation to other morphological categories in the language, in particular, its relationship with rival morphological processes. Unfortunately there is not space here to go into the specifics of Van Marle’s “domain hypothesis”. From a diachronic perspective, changes in the productivity of an affix may be attributed to the activities of a competitor, and this possibility is considered
with regard to \textit{ness} and \textit{ity} in chapter 5. However, we will find that it is necessary to carefully ascertain the extent to which the affixes are really competing.

\textbf{6.2.6. Blocking}

Blocking is defined by Aronoff as “the phenomenon of the non-occurrence of one form due to the simple existence of another”. The form which causes the blocking may itself be complex or simplex. For instance, \textit{*gloriosity} and \textit{*furiosity} do not occur because of the prior existence of \textit{glory} and \textit{fury} (1976:43-44). The existing noun is able to block the new derivative because it fills a predetermined slot in the lexicon, for, it is impossible for there to be two words with the same meaning and the same root in one person’s lexicon at the same time (1976:56). In contrast, \textit{ness} derivatives of \textit{Xous} adjectives are never blocked: to wit, \textit{gloriousness} and \textit{furiousness}. Aronoff claims that this is due to the fact that \textit{ness} is fully productive and thus \textit{ness} nominalizations do not have to be listed in the lexicon. Aronoff’s argument is circular: \textit{ness} derivations are not blocked because the \textit{ness} form is not listed in the lexicon; the \textit{ness} form is not listed in the lexicon because it’s so productive; the \textit{ness} form is so productive because it’s not listed in the lexicon.

Like Aronoff, Bauer regards “blocking” as a restriction on productivity, and his account of this phenomenon is chiefly derived from Aronoff. Bauer’s illustration is the prevention of the agentive nominalization \textit{stealer} in English “because of the prior existence of the word \textit{thief} which carries the appropriate meaning” (Bolinger in Bauer 1983:87). But Bauer extends Aronoff’s analysis beyond the bounds of the mental lexicon. A derivation can be blocked, he argues, by lack of acceptance in the linguistic community:
not only does there have to be something for a lexeme to denote, there also has to be a 
need (in a fairly loose sense) for a new lexeme to denote something before a new lexeme 
will be produced and accepted by the linguistic community. Since acceptance by the 
linguistic community is an important part of the process, it can be seen that blocking 
prevents not so much the coining of nonce complex forms as their institutionalization. 
(1983:87-88)

Romaine appears to agree: “Blocking doesn’t prevent coining: it acts only as a brake on 
institutionalization” (1983:195). According to Adams, the lack of an existing 
nominalization for the verb despise may be due to the presence of synonyms such as 
contempt, scorn and disdain. There have been persistent attempts over the years to 
nominalize this verb. Adams produces the following list from the OED, Webster and her 
own observations: despite, despisement, despisal, despiciency, despisery, and despision. 
“The persistence of attempts to nominalize the verb despise,” says Adams, “seems to 
indicate a continuing need to fill this gap in the vocabulary. Synonyms are a normal 
feature of the language; and for a language as richly endowed with them as English, the 
‘no need’ argument is a particularly weak one” (Adams 1973: 200).

By shifting the focus of his discussion to institutionalization, Bauer has situated 
blocking extralinguistically. Whereas Aronoff understands blocking as the prior 
occupation of a slot in the mental lexicon, Bauer argues rather that it is extralinguistic 
factors which determine whether a form will be “blocked” or not. Bauer’s version of 
“blocking” implicitly allows for a certain amount of variability, or the co-existence of 
synonyms: a brake on acceptance is different to a brake on existence or formation (cf. 
Bauer 1988:66-67). This variability may result in stratification according to social status 
or register.
Variability thus forms the basis of a diachronic account of “blocking”. Competition between lexemes may eventually result in one winning out over a period of time. This is illustrated by the historical account of the diachronic relationship between \textit{bigness} and \textit{size} in chapter 5. This formulation of “blocking” is not only capable of catering for the blocking of a derivation by another derivation or lexeme, but also situations in which a monomorphemic loanword is blocked by the existence of a derivation, as is the case with \textit{bigness} and \textit{size}.

\textbf{6.2.7. Semantic coherence and lexicalization}

A word-formation rule is semantically coherent “when the words formed by that rule adhere closely to the meaning assigned to them by the semantic function of that rule” (Aronoff 1976:38). I have referred to the loss of this semantic coherence as lexicalization. Bauer (1983) furnishes the example of the nominalization of the verb \textit{ignore}, \textit{ignorance}, which has a lexicalized meaning other than the activity of ignoring, which can be expressed by \textit{ignoration}, or, I would add, the gerund \textit{ignoring}. Bauer points out that \textit{ignoration}, despite being listed in the OED, is not acceptable to many people (1983:97).

Aronoff finds the meaning of derivations in \#ness more predictable than the meaning of derivations in +ity. Nouns ending in \#ness tend to have the meaning of “quality” or “state”, but +ity derivatives, which are not so predictable, can have “other readings: technical senses, concrete nouns, count nouns”. Aronoff cites as examples variety, notoriety, curiosity, porosity, monstrosity, continuity and discontinuity (1976: 38-39). This finding is supported by Romaine (1983:193-194). According to Aronoff there is a direct link between productivity and semantic coherence: “If we can accept them, the
value judgments of speakers also agree with the linking of productivity and coherence, for speakers will usually say of the ‘less likely’ member of a pair such as connectiveness/connectivity that ‘it should have a special sense’. Commonsensically, the correlation is perfectly reasonable: the surer one is of what a word will mean, the more likely one is to use it” (1976:39).

Aronoff has observed that the less productive suffix, namely –ity, has a greater tendency to lexicalize. Yet there is no real evidence that the lexicalization of derivations in this affix is responsible in any way for limiting the number of derivations produced by this word-formation rule. Aronoff is merely conjecturing that speakers will be discouraged from producing potential derivations on the basis of the existing lexicalized ones. There may be an association between lexicalized forms and low productivity, but we cannot be certain the lexicalizations actually restrict productivity. Bauer has hinted as much: “the inter-relation between productivity and lexicalization is very complex, and there is not necessarily an influence in one direction only” (1983:98). Potentially only a diachronic study could establish the direction of the causality. This question is explored further in chapter 6.

6.2.8. Analysability and transparency

Dalton-Puffer uses the Morphotactic Transparency Principle (MTT) developed within the framework of Natural Morphology to explain some of the developments observable in her Middle English data. She explains:

The scale of Morphotactic Transparency combines phonological and morphological criteria to make judgements about the degree of naturalness of morphological processes. It says that processes with higher constructional iconicity are more natural so that suffixes
with good MTT scores are acquired and suffixes with low MTT scores are lost from the language (or if encountered in a contact language, not borrowed). (1996:224)

Transparency in Natural Morphology, more broadly, is “the measure of the directness of the form-meaning relations of a complex lexical item” and it “integrates both the semantic and the phonological level” (1996:219). Naturalness ratings also have a relationship to productivity. Natural Morphology predicts that the more natural morphological processes are the more frequent and more productive (1996:215).

Assigning a process a transparency rating for a synchronic cross-section of Middle English derivation solves some of the problems mentioned in section 5.2.2. with regard to analysability in historical periods. Dalton-Puffer concludes ultimately that semantics is just as powerful (if not more powerful) a driving force behind shifts in the Middle English derivational system (1996:227). For instance, the success of the suffix –able is more than likely due to its representation of a major derivational category that had previously been underestimated. Criteria such as morphotactic transparency may be “in some sense secondary” (1996:225).

6.3 Extralinguistic factors

Extralinguistic factors might be more accurately called “metafactors”, because they undoubtedly influence some of the linguistic factors described above, such as the semantic specificity of an affix, affix generalization, or the lexicalization of derivations. In addition, certain factors presented as linguistic could be shown, in a different framework, to be extralinguistic, such as blocking. Extralinguistic factors can however also have a more direct influence on productivity, a fact tentatively acknowledged by
many theorists, but more explicitly by some, such as Romaine, who comments that
“people engaged in professional activity are more adept at forming new terms out of the
existing word-formation resources in a language, while others limit themselves more to
‘ready-made’ words” (1983:199). It is the very fact that word-formation rules are
optional, according to Romaine, that means they can be “exploited as stylistic resources”
(ibid.). In the light of such assertions, Aronoff’s remarks below are particularly
interesting:

In syntax, for example, rules are classified as either optional or obligatory, punkt. The
question of the degree to which a rule is optional is not of interest, except perhaps to
sociolinguists and stylisticians … there is one area, however, in which the question of
productivity cannot be ignored if one is to do serious work. That is the area of word
formation (Aronoff 1980:71).

Aronoff dismisses optionality in syntactic rules as due to social and stylistic factors.

Optionality in syntax is not so pervasive that it needs to be incorporated in a structuralist
account. The optionality of word-formation rules (i.e.variable productivity) is so
pervasive that it needs to be incorporated into a structuralist account. Now if optionality
in syntax is due to social and stylistic factors, surely so is optionality in word-formation.

Yet this aspect is om. itted in Aronoff’s theory of word-formation.

At the beginning of section 6 I suggested that the weighting of factors in relation
to each other needs to be reviewed. The neglect of extralinguistic or “performance”
factors affecting productivity in morphological theory, I would argue, is due to a tendency
to obliterate the distinction between independent and dependent factors affecting
productivity, a formulation I borrow from Romaine:

The second major point to be made from these results is that the factor of morphological
type of base, to which Aronoff assigns a major role in the conditioning of WFRs, is itself
a dependent, not an independent, variable in productivity. The factor is not a coherent one
in the sense that not all the words in each base category exhibit the average pattern shown by the class type as a whole ... can one isolate a unitary factor, morphological type of base, within competence; and if so, what is the evidence for it? In other words, is the variability in base types due to performance factors? (1983:185)

Studies of productivity such as those described in section 4, through their methodology, excluded extralinguistic factors from the explanation for productivity. In studies which aim to elicit speaker intuitions about productivity, speakers are supplied with entirely acontextual lists of words. Dalton-Puffer has said that “an explanation of language change that manages entirely without so-called extralinguistic factors is bound to be partial” (1996:223). She makes some brief remarks about “contextual appropriateness”, for instance written texts (which any historical study will have to make use of), are more likely to promote certain processes than spoken language. Dalton-Puffer speculates that this literate dimension might be responsible for the prevalence of abstract nouns in the Middle English part of the Helsinki corpus. On the other hand, it is unlikely that one will find as many diminutives in written texts as spoken language (1996:217).

Baayen and Renouf’s most important criticism (in their view) of the structuralist approach to morphological productivity is that it “fails to take into account that word formation is conceptually driven, and that the restrictions defining a word formation rule only set the boundary conditions for word formation” (1996:90, my emphasis). The function of word-formation, they suggest, “is to convey (particular shades of ) meaning, not simply to produce forms with a particular structure” (ibid.).

Shades of meaning will be conditioned by context. Baayen and Renouf acknowledge that their study has been based on a restricted kind of English, newspaper English, but they note “the way in which words are put to use, however, may vary
substantially from genre to genre, from text type to text type, and even from author to
author,” and that “there is some evidence that suggests that the productivity of affixes is
similarly subject to variation as a function of text type and style” (1996:90). This kind of
variation needs to be explored in a comparative study of different text types. In the
remainder of this chapter I will review some existing discussion of extralinguistic factors.

6.3.1. Pragmatics

Bauer includes pragmatics in the list of factors restricting productivity, given that “a
number of researchers have come independently to the conclusion that pragmatic factors
must be appealed to if a satisfactory account of word formation is to be given” (1983: 85).
This allows Bauer to have access to pragmatics when other factors fail to account for a
lack of productivity. Bauer defines pragmatics as “the influence of knowledge and beliefs
about the structure of the real world, in contrast to knowledge about the language-
system”, and identifies two pragmatic “requirements” of the referent of the neologism,
namely the “requirement of existence” and the “nameability requirement”. The
requirement of “existence” dictates that “a word will not be formed to denote an
item/action/quality which does not exist”. The nameability requirement requires the
appropriate derivational morphology be available to express together with the base the
given concept or item (1983:85-87). With regard to the nameability requirement, the
range of derivational categories available in a language was discussed in chapter 1. The
requirement of existence corresponds to the conventional notions of neologising that were
explicitly criticised in that chapter, for, among other mistakes, not taking into account that
neologisms may also be coined for stylistic or expressive reasons.
6.3.2. Creativity

In section 5.2.1, I observed that by using hapax legomena as a measure of lexical innovation, Baayen and Renouf would be ignoring newly coined words used more than once in a text by their creators. Baayen and Renouf are interested in measuring innovation in relatively highly productive processes only, which supposedly do not produce words used deliberately for effect. This kind of distinction is quite prevalent in the literature. Dalton-Puffer explains that sometimes “the notion of creativity is understood as being anchored in the speaker, in the sense that s/he makes a conscious decision to coin a new lexical item. However, in such a case speakers can be observed applying morphological rules which are clearly unproductive, plus a variety of strategies other than affixation and compounding (blends, acronyms etc.)” (1996:220). In the end Dalton-Puffer prefers to collapse the notion of creativity with productivity: “Creativity as it is understood here has little to do with the conscious decisions of speakers but is the potential or likelihood of a given affix to be used unintentionally for the coining of morphologically complex words. Strictly speaking, in the absence of psycholinguistic tests, we are talking about the statistical probability of encountering neologisms exhibiting a certain affix in a certain corpus” (ibid.).

For Bauer, analogy is a factor which limits productivity. He claims that a new analogical formation is not likely to give rise to a productive series. Analogy is another “factor” which should simply be associated with low productivity rather than regarded as a cause of low productivity. The origins of an affix pose no actual restrictions on the
productivity of that affix. Whether a such a process becomes productive or not is dependent on a host of extralinguistic factors.

I will not be distinguishing between creativity and productivity, as I have previously indicated with regard to Baayen and Renouf’s distinction between ephemeral and deliberate innovations. Creativity is not an empirical notion. There is no objective way of determining whether a formation has been produced deliberately or creatively. Furthermore, in the following case studies of productive affixes, it will become evident that creative and deliberate word-formation is not something that is restricted to rarer word-formation processes such as blends.

6.3.3. Prescription

Bauer’s account of productivity includes an ad hoc mention of the “rejection of some lexical innovations on aesthetic grounds” as a restriction on productivity. He says that “even though these factors are, by their very nature, idiosyncratic, and thus impossible to take into account systematically in a grammar of word-formation, they must be mentioned as adding an extra filter to word-formation processes” (1983: 97). The temporality of attitudes towards new words is very evident in this example from Adams: The Daily Chronicle’s comment on the now completely uncontroversial *aviation* in 1909 is “You could hardly think of a worse word” (1973:2).

Adams observes that “innovations in vocabulary are capable of arousing quite strong feelings in people who may otherwise not be in the habit of thinking very much about language” (1973:1). I will hazard a guess, even, that prescriptive attitudes towards lexis are more common than prescriptive attitudes towards syntax, on account of the
greater variability in the lexicon than in the grammar described in section 4. Some of the reasons Adams identifies for the objections to new words are simple unfamiliarity, the use of Latin and Greek elements without any regard for the word-formation rules of those languages (both of which point to stratification according to level of education), and regional differences (British speakers tend to be more conservative about word-formation than American speakers).

In a solely corpus-based study such as the present one it will not be possible to distinguish language attitudes from other motivations for neologising in a register or style. I have occasionally referred to prescriptive remarks about individual word-formation processes as a comparison to developments shown in the corpus. There is a need, however, for systematic studies of attitudes towards word-formation, which unlike Bauer, I believe are possible. For Modern English, this would require a representative sample of real formations tested against a representative sample of speakers. A historical study presents more challenges, requiring detailed research on the attitudes of a historical period which would then be compared to the practices of that period.

7. Conclusion

The study of word-formation is sadly lacking in corpus-based, context sensitive studies. This study, which takes into account register differences, is designed to fill such a gap. As an extralinguistic factor, register is treated as a force which is driving productivity, as a primary rather than a secondary factor, or independent rather than independent. This is not to say that linguistic/structural factors should be excluded from diachronic theories of word-formation, but they are not the focus of this study. Corpus-based diachronic studies
can only examine items which have already been produced, and presumably a structural restriction acts to prevent derivations from occurring. Using a dictionary, Aronoff (1976) was able to estimate the proportions of bases which had been derived to those which had not. This is not possible in a corpus study, which does not make use of hypothetical formations but real ones.
3 Methodology

1. Introduction

I chapter 2 I reviewed studies of change in productivity, and drew attention to how productivity was measured at different periods and then compared to provide a diachronic perspective on productivity. I also discussed some of the issues that a diachronic analysis of productivity in English word-formation must be concerned with, such as the identification of neologisms, lexicalizations, loanwords and Latinate coinings. In this chapter I will briefly outline the procedures that have been adopted in the present study for the measurement of productivity, and the tracking of changes in productivity.

In section 2 I provide some background to the selection of the derivational affixes -(t)ion, -ness and -ity as the focus for this study, and the place of these affixes in the systems of Early Modern and Modern English word-formation. In section 3 I describe the two historical corpora that comprise the sample for the study, and their division into subperiods, text types and registers. In section 4 I describe the process of text retrieval used to elicit data on -(t)ion, -ness and -ity from the corpora. The methods used for the measurement of productivity and change in productivity are explained in section 5. Sections 6 and 7 consider problems that arise from the size of the corpus and the normalisation of results. The statistical testing of the significance of the results are briefly described in section 8. In section 9 I explain how the most productive registers are identified.
2. Selection of affixes

I have suggested that in order to develop a detailed account of change in derivational morphology it will be necessary to focus on individual affixes. This represents a departure from comprehensive overviews of the English word-formation system for certain periods in the history of the language (Křovský 1992, Burnley 1992, Dalton-Puffer 1996, Nevalainen forthcoming). Of the detailed studies of individual affixation processes in English, a good proportion are on nominalizing affixes and derived nominalizations, for example, Fleischmann (1978) on *-age*, Romaine (1985) and Riddle (1985) on *-ness* and *-ity*, Gadde (1910) on *-ery*, *-age* and *-ment*, and Reichl (1982) on deadjectival abstract nouns in English. Of these individual studies only Romaine (1985) is quantificational, but, as described in chapter 2, the corpus in that study is very small.

There are several reasons for focusing on nominalizing affixes in the present study. First, category-changing derivational processes, which are closer in nature to inflection, are likely to yield more examples in a corpus study than non category-changing processes, for example diminutives, or the feminine suffix *-ess*. This is not always the case however, but simply a rule of thumb. Baayen and Renouf (1996) find the negative prefix *un-* to be as productive as *-ness* and more productive than *-ity*. Of the category-changing processes, the choice of noun-forming over adjective- and verb-forming affixes is to a certain extent arbitrary, although we will see in chapters 4 and 5 that nominalization is often accorded a very salient role in discourse, which offers opportunities to explore the role of a word-formation process in different kinds of writing.
Nominalizing suffixes tend to be classified along similar lines. Noun-forming suffixes are classified according to the category of their base, as deverbal, deadjectival or denominal. Several noun-forming affixes occur with more than one category, and some, such as –age, occur with all three. Usually noun-forming suffixes have a preference for one category of base. A distinction is often made between concrete noun-forming suffixes, also called agent noun-forming suffixes, and abstract noun-forming suffixes, whether as an explicit organising principle of data or mentioned with regard to individual processes (Dalton-Puffer 1996, Nevalainen forthcoming 7.5.3.1., Kastovsky 1992:384-389). For Middle English, Dalton-Puffer identifies the set of abstract noun-forming suffixes as -dom, -hede, -lac, -ness, -reden, -ship, -th, -ung, -acioun, -acy, -age, -al, -aunce, -erie, -ite and -ment, and the agent/concrete noun-forming suffixes as -el, -end, -ere, -estre, -ild, -ling, -ant, -ard, -ary, -erel, -esse, -our.

The picture has of course changed by Early Modern English. Nevalainen identifies the following concrete noun-forming suffixes: –eer, –er, –ess, –et, –ette, –ician, –kin, –let, –ling, –ster, and –y (denominal); –ant, –ent, –ard, –ee, –er (deverbal) and –by and the only concrete deadjectival noun-forming suffixes seem to be –ton and –by, which are present in rare personal nouns such as simpleton (1650) and rudesby (1566). The abstract noun-forming suffixes are –age, –ate, –cy, –dom, –ery, –ful, –hood, –ing, –ism, –ship (denominal); –age, –al, –ance/ence, –ation, –ing, –ment, and –ure (deverbal); and –acy, –ancy/-ency, –ity, –ness (deadjectival).

The three suffixes examined in the present study all form abstract nouns. Concrete noun-forming affixes, apart perhaps from the agentive –er, tend to be more specific in their semantics, and therefore less productive, for example the
pejorative personal suffix –ard as in laggard. All three are abstract, because it was necessary to have affixes that were similar in function. Ideally this study would look at the whole set of abstract noun-forming suffixes, but that would involve sacrificing detail about individual affixes. I have focused on the most productive abstract noun-forming suffixes. -ation has been described as the “most productive” of the deverbal affixes denoting action (Nevalainen forthcoming 7.5.3.1.4.) and the main suffixes that derive abstract nouns from adjectives are the native –ness and the non-native –ity (Nevalainen forthcoming 7.5.3.1.5.). It was necessary to choose the most productive abstract noun-forming process for Early Modern and Modern English, for practical purposes, in order to produce a reliable picture of change. In section 6 I consider when results start becoming unreliable for very low numbers.

The only deverbal noun-forming suffix that is probably more productive than -(t)ion is the gerundive –ing. It has not been selected on the grounds that it can be regarded as an inflectional affix, or a grammatical process (Quirk et al. 1985:1547 and Nevalainen forthcoming 7.5.3.1.4.) and the research question of this study is to understand the variable productivity of derivational morphology. We should not ignore however that –(t)ion derivations will clearly be affected by competitive relationships with –ing derivations.

This study features a deverbal process and two deadjectival processes. Denominal processes are not represented because there is not really a comparative productive denominal abstract process. There are two deadjectival affixes –ness and –ity, because
that will give us an opportunity to study competitive relationships, and how they should be dealt with in a diachronic theory of word-formation.

It is evident from the various accounts of nominalizing suffixes in English that the set of suffixes which form abstract nouns have interesting and overlapping relationships, especially their semantics (see Dalton-Puffer 1996:120-130). I will be drawing on the remaining set for comparison and illustration of various issues. Focusing the study on these abstract noun suffixes is not only expedient given that they form a coherent group, but allows for opportunities to study interesting discourse functions (abstract nouns play a variety of crucial roles in discourse), relationships of variation (the common and overlapping functions –ness and –ity, and also other suffixes), and processes of lexicalization (there is evidence that these suffixes lexicalize according to similar patterns). Detail about the histories of –(t)ion, –ness and –ity is given in chapters 4 and 5. Quantitative measurements for the suffixes –(t)ion, -ness, -ity will be presented those chapters.

3. The sample

The two historical corpora which make up the sample for this study are the Early Modern section (1500-1700) of the Helsinki Corpus of English Texts (henceforth HCE) and ARCHER (A Representative Corpus of Historical English Registers) which runs from 1650 to the present. The Helsinki Corpus has been developed at the University of Helsinki under the direction of Matti Rissanen (Kytö 1996). The construction of the Helsinki Corpus was motivated by “the theoretical assumption that a systematic study of language variation, both synchronic and diachronic, is a rewarding method in historical
linguistics” (Nevalainen and Raumolin-Brunberg 1989:70). ARCHER was developed by
Douglas Biber and Edward Finegan and designed for the purpose of investigating “the
diachronic relations among oral and literate registers of English between 1650 and the
present” (Biber, Finegan and Atkinson 1994:1).

HCE is divided into three subperiods of 70 years each: 1500-1570; 1570-1640;
1640-1710. ARCHER is divided into 7 periods of 50 years each. For ARCHER, British
texts were collected for each period, and for three periods there is a parallel set of
American texts - the second halves of the eighteenth, nineteenth, and twentieth centuries:

<table>
<thead>
<tr>
<th>Table 1 Subperiods in ARCHER (Biber, Finegan and Atkinson 1994:3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>1. 1650-1699</td>
</tr>
<tr>
<td>2. 1700-1749</td>
</tr>
<tr>
<td>3. 1750-1799</td>
</tr>
<tr>
<td>5. 1800-1849</td>
</tr>
<tr>
<td>6. 1850-1899</td>
</tr>
</tbody>
</table>

The possibility of exploring regional differences presented by ARCHER has not been
taken up in this study, but I do give breakdowns for British and American data where this
factor appears to be exerting some influence. I have used both corpora in order to obtain a
long stretch of time over which to observe productivity. It is necessary to observe
productivity over a long stretch of time in a historical corpus1 given the time that it takes
to build up a threshold of existing types before new types can be reliably assumed to be
representative of the period in which they occur. This phenomenon is explained in greater

1 Or many subperiods in a diachronic corpus of Modern English such as that used in Baayen and Renouf
(1996). Given that historical corpora such HCE and ARCHER are much smaller, the individual subperiods
need to be much longer.
detail in section 4. For a study of nominalization post Middle English, HCE on its own would be insufficient, as it only spans two centuries, and results would only be reliable halfway through the corpus. With AR sher only, results would only become reliable from about the mid-eighteenth century, and no data would be available from Early Modern English at all. Using both together, we can start to build up a picture of the behaviour of the affixes from 1650. The corpora overlap in the latter half of the seventeenth century, and it is therefore possible to compare the results obtained for the last period of HCE and the first period of AR sher.

The text types represented in the Helsinki Corpus are: private and official correspondence, statutes, trials, drama (comedy), fiction, (auto)biography, travelogue, news, diaries, handbooks, education, science, history, education, philosophy, sermons, and the bible. "Text type is here understood," say Nevalainen and Ramoulin-Brunberg, "in the broad sense of genre, including both literary and non-literary forms of writing" (1989:95). The selection of texts is based on language-external criteria. This means that there is often internal variation within a text type (1989:96). This may be due to situational parameters such as the purpose of the text (text types may be multifunctional), social and age differences of writers, or conscious stylistic choice, especially in more literary domains of writing (Nevalainen and Ramoulin-Brunberg 1993:63). Examples of text types which show internal variation are letters (the variation is partly catered for by the division into official and personal correspondence) and sermons, which fluctuate between plain and rhetorical styles (1989:99). The internal variation of text types is by no means glossed over and actively taken into account in chapters 4 and 5. The texts in
ARCHER are classified into ten registers. The compilers have attempted to ensure an equal representation of speech-based and written genres:

<table>
<thead>
<tr>
<th>Written</th>
<th>Speech-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journals-Diaries</td>
<td></td>
</tr>
<tr>
<td>Letters</td>
<td></td>
</tr>
<tr>
<td>Fiction</td>
<td>Fictional conversation*</td>
</tr>
<tr>
<td>News</td>
<td>Drama</td>
</tr>
<tr>
<td>Legal opinion</td>
<td>Sermons-Homilies</td>
</tr>
<tr>
<td>Medicine</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td></td>
</tr>
</tbody>
</table>

(Biber, Finegan and Atkinson 1994)
* I have treated Fiction as one register.

Legal opinion is only present in the corpus from 1750. All legal opinion is American, and all Science is British. For Medicine, the 1750-1800 subperiod is British only, and the 1950-1990 subperiod is American only. HCE text types and ARCHER registers are only partially compatible, and I have not treated them as continuous, as I have the subperiods. There are 6 overlapping genres: letters, fiction, news, diaries/journals, sermons, and science, although ARCHER does not distinguish between personal and private correspondence. Legal opinion is not quite the same as statutes or trials. It is ARCHER that is used for the assessment of the effect of register on text type. I do however give breakdowns according to text type for the last period of HCE, but this is intended just for comparison. The compilers of HCE sampled 2 texts for each text type per subperiod (1993:62). The compilers of ARCHER sampled many more texts per subperiod, but the excerpts are much smaller. Finally, I will provide some information about the size of the corpora. The table below reflects the sizes of the three subperiods of HCE:
The discrepancies in size for the periods of HCE, especially between E1 and E2, are actually fairly small compared to the discrepancies in size between the subperiods of the Middle English and Old English sections of the Helsinki Corpus. If the differences between all three subperiods were as negligible as that between E1 and E2, it would probably not be necessary to normalise the data. However the 10 000 word difference between E3 and E1/E2 requires normalisation. ARCHER is designed to feature 20 000 words per period in every register (this is referred to as a “cell”), yielding a corpus of 2 million words. But ARCHER is still under construction, and currently looks like this:

<table>
<thead>
<tr>
<th>Register</th>
<th>1650-1700</th>
<th>1700-1750</th>
<th>1750-1800</th>
<th>1800-1850</th>
<th>1850-1900</th>
<th>1900-1950</th>
<th>1950-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drama</td>
<td>32 391</td>
<td>43 161 (2)</td>
<td>33 265</td>
<td>71 161 (2)</td>
<td>26101</td>
<td>67 352 (2)</td>
<td></td>
</tr>
<tr>
<td>Fiction</td>
<td>31 175 (2)</td>
<td>90 367 (4)</td>
<td>58 413 (2)</td>
<td>89 543 (4)</td>
<td>49 177 (2)</td>
<td>107 037 (4)</td>
<td></td>
</tr>
<tr>
<td>Journal</td>
<td>21 912</td>
<td>44 708 (2)</td>
<td>22 826</td>
<td>41 954 (2)</td>
<td>13 437</td>
<td>9 253 (2)</td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>21 847</td>
<td>34 073</td>
<td></td>
<td>29 093</td>
<td>21 951</td>
<td>26 111</td>
<td></td>
</tr>
<tr>
<td>Letters</td>
<td>13 506</td>
<td>14 111</td>
<td>24 751 (2)</td>
<td>23 544 (2)</td>
<td>13 388</td>
<td>27 367 (2)</td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>8 156</td>
<td>17 103</td>
<td>6979</td>
<td>49 272 (2)</td>
<td>20 855</td>
<td>9620</td>
<td></td>
</tr>
<tr>
<td>News</td>
<td>24 660</td>
<td>21 894 (2)</td>
<td>48 864 (2)</td>
<td>45 900 (2)</td>
<td>22 419</td>
<td>50 996 (2)</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>18 928</td>
<td>21 571</td>
<td>21 097</td>
<td>22 631</td>
<td>22 675</td>
<td>23 226</td>
<td></td>
</tr>
<tr>
<td>Sermons</td>
<td>11 372</td>
<td>8 854</td>
<td>24 537 (2)</td>
<td>29 022 (2)</td>
<td>4273</td>
<td>27 864 (2)</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>162 100</td>
<td>173 966</td>
<td>348 022</td>
<td>225 892</td>
<td>402 120</td>
<td>194 275</td>
<td>348 826</td>
</tr>
</tbody>
</table>

In Table 4 American and British “periods” have been combined, as well as the two registers (spoken and written) which comprise the fiction register. I have indicated in parentheses how many “cells” a cell in the table represents, if the number is more than 1.
Even if single cells are compared, there are still fairly serious discrepancies in the size of the cells, and normalisation is unavoidable.

4. Text retrieval

The concordancing programs used to search for -(t)ion, -ness and -ity were Wordcruuncher in the case of HCE, and D’Accord in the case of ARCHER. In HCE particularly, each affix had a wide range of spelling variations. For -ness and -ity they are shown below:

ness/nesse/nys/nes/nis
ity/itye/etye/itie/ite/yte/ytie/itee/tie/ety

For -(t)ion, searching for the string -ion covered types with -(t)ion, -cion and -sion and the string -yon covered types in -tyon, -cyon, and -syon. There were some cases of -shon, as in commendashon. These results files could only be treated as an initial diagnostic. It was necessary to go through the texts manually, which served as a check to the figures, ensured that all the spelling variations were captured, and also ensured familiarity with the content of the texts, essential for a study of register differences. I present here the guidelines followed in the collection of data:

(i) Cases in which there is no etymological association with the affix in question were excluded, from the more obvious pity and city in the case of -ity, and lion in the case of -ion, to items that are more difficult to pick up such as companion, criterion, cushion, ganglion, legion, medallion, pavilion, scorpion, vermilion in the case of -ion, and lithotrity in the case of -ity.
(ii) Singular and plural forms of a lexeme are counted as one type, for example *kindnesses* and *kindness* are counted as a single type.²

(iii) Proper nouns are excluded, for example *Trinity College, Soviet Union*. There are however debatable instances, such as "the Trinity" in religious texts, which I have included.

(iv) Items which appear in French or Latin quotes are excluded. Such sections are clearly labelled in the corpora.

(v) Prefixed and compounded items are regarded as types distinct from their non-prefixed or non-compounded counterparts, for example, *biocompatibility* is regarded as a separate type from *compatibility*, with the assumption that

*biocompatibility* is a nominalization of *biocompatible* rather than the prefixation of *compatibility* with *bio-*. The same assumption is made for action nominalizations such as *degeneration* or *biodegradation*. This does not work however in the case of *inaction, non-amputation*, as negative affixes do not

usually to verbs. Compound nominalizations are usually compound adjectives with *-ness, shamefacedness, stiff-neckedness, warmheartedness, underhandedness*, but perhaps a question mark should be placed next to *soul-stillness* Examples of prefixed deadjectival nominalizations include *self-righteousness* and *inactivity*.

(vi) Derivations acting as a part of speech other than a noun have been excluded, for example *mention, occasion*, and *witness* when they are used as verbs.

² In chapter 6 I demonstrate that the appearance of a plural does not necessarily imply that an abstract noun has developed a concrete meaning.
I explained in chapter 1 that I have not be attempted to distinguish loanwords from English derivations, by ascertaining whether their bases are independent words in English. It could be argued that measurements of the productivity of an affix are obscured by the presence of numerous loanwords in that affix. There is no way of completely eliminating this danger without also inadvertently throwing out some Latinate coinings. However, in section 6 we will see that one of the procedures for measuring productivity adopted here involves identifying only the new types which appear in each time period. Loanwords, which are typically older words, tend to be eliminated in the early stages of this process.

5. Measurement of productivity over time

5.1. Hapax legomena

In chapter 2 I described how Baayen and Renouf (1996) rely on the numbers of hapax legomena in a word-formation process as the most reliable indicator of productivity, or lexical innovation in that process. In comparatively small historical corpora such as the ARCHER and HCE hapax legomena are less likely to be lexical innovations in the language. I have therefore not provided a count of the hapax legomena in this study. Furthermore, Baayen and Renouf disregard potential new words that have been used more than once by their creators. I have explained that, unlike Baayen and Renouf, I am interested in new words that are created deliberately, as well as the "ephemeral" instances that they are more concerned with.
5.2. Type frequency

Studies of productivity which make use of dictionaries are automatically concerned with the word types of a word-formation process rather than the tokens. Corpus studies of productivity, however, must distinguish between types and tokens. The total number of tokens and the total number of types in each suffix are both given for the subperiods of the Middle English section of the Helsinki Corpus by Dalton-Puffer (1996). Romaine (1985) only gives the number of types in -ness and -ity for the three different translations of Boethius that comprise her corpus.

It is types that are regarded as the indicators of productivity: “The existence of a correlation between productivity and type frequency ... is uncontested even in a pre-theoretical understanding of the notion of productivity: a productive morphological rule produces many different words (types), and it is therefore likely that in a given corpus a productive suffix will occur more often than an unproductive one” (Baayen and Renouf 1996:217). Token frequencies can be misleading as far as productivity is concerned, as the token count can be inflated by very common types, such as business or (your) highness. In the present study, the number of word types and word tokens in the three affixes are counted for each subperiod of HCE and ARCHER. The raw figures are normalised to obtain type and token frequency per 100 000 words. This process is described further in section 7. Here as well, types are regarded as being the most revealing of productivity. I hypothesize that if an affix is “productive” (i.e. used to coin new words, either with consistent intensity or increased intensity), we could expect an increase in type frequency over time. What we have is thus an aggregation: new types are
added to the total of types for the previous period each time. Depending on the rate of increase, the productive affix might show a straight or curved slope.

5.3. New type frequency

Although simple comparison of type frequency across subperiods should reveal changes in the productivity of an affix, changes in productivity can be better observed by comparing only the new types which occur in each subperiod. This is the method implemented by Baayen and Renouf (1996), who present new types in the affixes -ly, -ness, -ity, un- and in- as a function of sampling time. Ideally, newly-occurring words can be identified by checking each new period of text against a starting lexicon of established words, and eliminating word types that have occurred previously. If no "base" lexicon of words in time prior to the corpus is available, then it must be assumed that all the words in the first period are new, which is not true of course, but it provides a basis for saying that words are new in successive periods. There will only be relatively few new words in each new period, even though they may account for a good proportion of the types. It is important to bear in mind that one is not looking at the language as such, but only at tiny samples of it, and it is not possible to expect or claim to have found everything (Antoinette Renouf: personal communication).

When this procedure was applied to the present study, rather than treating the first period of HCE as if all the words in that period were new, and then counting new types in successive subperiods, I have used the first two subperiods of HCE as a base lexicon. New types are thus measured from 1650 for ARCHER only. It is unlikely that the second

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3 Assuming that there are no losses. It is not unlikely that certain derivations become obsolete over the time span of the corpora, and will therefore not appear in later periods. However, there is no satisfactory method of determining whether a word is obsolete.
period of HCE would have yielded a reliable result, but we can have more confidence in the new types from 1650 onwards. It is also possible to compare the number of new types in the third subperiod of HCE to the number of new types in the first subperiod of ARCHER using the same base lexicon. It has been necessary, as for types, to normalise the numbers of new types to obtain a frequency per 100 000 words. Ideally, if the rate at which new words are coined in a suffix remains constant, then a graph will show a straight line. If the productivity is increasing, this would be reflected by a slope.

6. Errors due to sample size

It is hard to know exactly when a corpus is big enough to capture a sufficient number of the entire population of types for a study of word-formation processes. We do know that historical corpora such as ARCHER and the Helsinki Corpus are substantially smaller than the modern corpora available. I maintain nevertheless that it is important to develop a methodology for the diachronic study of word-formation. In doing so, it is necessary to remain aware of the effects of small size on the results of the study.

I have already mentioned the effect of size on hapax legomena. In a small corpus many types which appear as hapax legomena are less likely to be rare or newly coined words in the language. There are some important effects on type frequency which must be taken into account. For an individual subperiod, not all the types which have occurred prior to that period in the corpus will re-occur in that period, and so it is unlikely that the type frequency of a productive affix will show a perfect aggregation over time. For example, *cheapness* occurs in ARCHER for the first time in 1700-1750. *Cheapness* recurs in 1750-1800 but not in 1800-1850. It occurs again in 1850-1900, but not at all in
the twentieth century. And *cheapness* is a relatively common type. Rarer types are less likely to recur, even though they may still be used in an ongoing fashion.

The effects on the new type frequency are as follows: types that appear as new in a subperiod (i.e. they have not occurred before in the corpus) might not be new in the language, but because of the small sample, they only appear at that time. A starting lexicon goes some way toward addressing this problem, but the starting lexicon in the present study is not capable of representing most of the existing items before 1650. The effect on the results is a complex one: the first subperiod, and possibly some subperiods after that, will seem to have an artificially high number of new types. These items may well be much older, but they have not appeared in the starting lexicon. The new types for each subperiod will become less and less inflated as the existing population of types comes to be represented in the corpus, and later time periods are more likely to represent only the “normal” amount of new types in that affix. I pointed out this “decreasing effect” in Baayen and Renouf’s results in chapter 2. In the present study it could be at work for -(t)ion and -ness, but not for -ity, judging by the comparison of new types in Table 5:

<table>
<thead>
<tr>
<th>Affix</th>
<th>1650-1700</th>
<th>1700-1750</th>
<th>1750-1800</th>
<th>1800-1850</th>
<th>1850-1900</th>
<th>1900-1950</th>
<th>1950-</th>
</tr>
</thead>
<tbody>
<tr>
<td>-(t)ion</td>
<td>80.2</td>
<td>54</td>
<td>48</td>
<td>42.9</td>
<td>31.6</td>
<td>38.6</td>
<td>39.3</td>
</tr>
<tr>
<td>-ness</td>
<td>33.9</td>
<td>16.7</td>
<td>18.4</td>
<td>14.6</td>
<td>13.7</td>
<td>22.7</td>
<td>10.3</td>
</tr>
<tr>
<td>-ity</td>
<td>14.8</td>
<td>19</td>
<td>18.7</td>
<td>19</td>
<td>12.2</td>
<td>12.4</td>
<td>16.3</td>
</tr>
</tbody>
</table>

Whether these results are distorted or whether the seventeenth century does in fact have high numbers of new types in -(t)ion and -ness will be debated further in chapters 4 and 5.
7. Normalisation

The type frequency and new type frequency were normalised to a frequency per 100 000 words to accommodate the irregular sizes of the different subperiods of the corpora. Normalisation is not carried out by Dalton-Puffer (1996), despite the discrepancies in the size of the ME subperiods⁴, but she does make accommodations for this in her discussion of the performance of individual affixes (1996:20). It would too complicated in the present study, which is concerned with 9 different subperiods altogether, to make accommodations for different sizes in the analysis of the results.

Baayen and Renouf (1996) too, must normalise their data because the number of tokens for each of the 40 months of their study is not the same for each month. They therefore present the resulting curve of the increase in number of new types “as a function of sampling time (in tokens) rather than in real time (in months)” (1996:72). They focus mainly on the distribution of affixes in sampling time, “since the irregularities in the numbers of tokens sampled per month are irrelevant for the analysis of productivity” (ibid.). This kind of averaging is not problematic when subperiods are so close together. It is not as if Baayen and Renouf are interested in comparing adjacent months. It would not be possible to do this in a historical study.

Biber has normalised the frequency counts of the linguistic features used in his multi-dimensional analysis of different registers to a text length of 1000 words (Biber 1988:75-78). It is important to note that Biber’s counts of linguistic features are of

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⁴The word counts of the first three subperiods of the ME section of the Helsinki Corpus are:
ME1 113 010
ME2 97480
ME3 184 230
tokens, rather than types. Most of these features are grammatical, for example relative pronouns, personal pronouns, but some are lexical, such as derived nominalizations. Biber, who is not concerned with productivity, has counted the tokens of derived nominalizations rather than the types, or different combinations formed by this feature. By normalising these to a frequency per 1000 tokens, Biber is counting like out of like.

Variationist sociolinguistic studies are typically not concerned with normalisation because they present their results in the following form: x number of variant A and y number of variant B out of a total of x + y tokens of the varying feature. As long as the variants are elicited from the same sample, there is no need to normalise. These studies too, are counting like out of like. My point is that counting the number of types out of a number of tokens is not counting like out of like. This does not mean that the normalised type frequency and new type frequency are inaccurate. In a sense, the results have simply been made proportional, but it is nevertheless important to be able to present the results as like out of like. I have therefore included an additional measure of productivity: the percentage of new types, in which the number of new types in each subperiod is presented as a proportion of the total number of types that occur in that subperiod. One further difficulty remains. No form of normalisation will adequately be able to compensate for the fact that subperiods which have a higher number of tokens, have a greater statistical probability of picking up rarer types. I therefore monitor this effect by testing the correlation between sample size, and the percentage of new types, a procedure described in the next section.
8. Statistical tests

Finally, I will test whether the relationship between new type frequency or percentage of new types and time is statistically significant. What is really being tested is the probability of the same results arising through coincidence. The test of significance selected here is chi square ($\chi^2$).\(^5\) For chi square it is important to compare like with like, therefore the values used here are taken from the percentage of new types measure. However, it is also important to use the raw figures and not the percentage itself. With new types, old types, and time as three independent nominal variables, and a dependent frequency variable, $\chi^2$ is calculated for a significance level of $p \leq 0.05$. An alternative method of calculating chi square is to use new tokens and old tokens rather than new types and old types. There is little likelihood of common types inflating the number of new tokens, as new types tend to have a type to token ratio of 1:1, or at the most 1:2 or 1:3. This alternative calculation is based on an example used by Butler (1985:198).

It is important to remember that the chi square test does not provide much information other than an indication of whether or not there is a relationship between the distribution of new types and time. The test does not tell us anything about the nature of that relationship. Furthermore, the results may prove to be mathematically significant, but this does not mean they are significant in a broader sense, i.e. that such a relationship definitely exists in the general population, or, in this case, the language. The probability of a relationship arising out of chance, increases as the sample decreases. The results are therefore only as reliable as the size of the corpus.

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\(^5\) Other tests of significance are not appropriate because there are not enough cases for a frequency distribution. More cases could be created by subdividing the subperiods further, but there is a trade-off between number of cases and reliable values.
The other statistical test of relationships between variables applied to the data is correlation, “that area of statistics which is concerned with the study of systematic relationships between two (or more) variables” (Butler 1985:137). The test ascertains whether high values of variable X tend to go with high values of variable Y (positive correlation) or whether low values of variable X tend to go with high values of variable Y (negative correlation). A “correlation coefficient” is calculated to quantify the relationship. A value of +1 indicates a perfect positive correlation, and −1 a perfect negative correlation. Taking into account the number of cases, we can then look up the critical values for which the correlation coefficient is significant at the 5 percent level. I have used this test primarily to address the concern expressed in section 7 about the possibility of subperiods which are larger in size picking up a greater number of rare types. I therefore test for a correlation between percentage of new types and sample size. But it is also possible to use correlation to further test the significance of the relationship between between the percentage of new types and time.

9. Register

There are two possible ways of examining the effect of register on text type. The first is to treat the registers of ARCHER as individual corpora, and measure the type frequency, new type frequency and even the percentage of new types for each register. However, with this method, all the abovementioned problems associated with small corpus size are more exaggerated for individual registers. Dalton-Puffer makes the following comments about the Helsinki Corpus:

the HC is too small to yield reliable results from a process of breaking down the corpus by an increasing number of parameter categories. The number of incidences of a certain item will most likely be so low that they won’t reach significance level. If one was
interested in following up the above-mentioned parameters, results from a search in HC
could only be regarded as diagnostic and would have to be checked on a wider basis of
data. (1996:22)

The alternative method that I have used to investigate the effect of register on
productivity is to break down the new types for each subperiod into their component
registers. This tells us which registers are contributing the most new types. This does not
solve the problems described by Dalton-Puffer in that the registers are still small size
samples of text, but at least it means that the new types for each register are not arrived
at through very distorted means.

The second method would allow us to observe when derivations common
in other registers are imported into a specific register, sometimes with a new
meaning, for example, the use of affection in the scientific register to mean “the
action of affecting” in 1700-1750 and 1850-1900 (see chapter 5), or version in
medicine with an obstetric meaning in 1850-1900. Yet for the moment we are
quite crudely concerned with new types, rather than new senses.
4 The discourse motivations of neologising

New words are bandied about by all in sundry, as soon as they catch on, so it is only necessary to keep your ears open for this elementary stuff. Expert consultants do more than this: they invent their own jargon. They use words in a way which nobody has heard before, thus underlining once again separateness from their clients... The technique for inventing jargon is simple enough. The trick is to take a noun in common use, and turn it into a verb; or, to reverse the procedure. Loathsome, but impressive-sounding words emerge in this barbarous manner. Profit can spawn 'profitalise'; merchandising can develop 'merchandisation'. And so on. (Nigel Spivey, Bluff your way in Consultancy)

1. Introduction

This chapter addresses the neglect of the contextual or extralinguistic factors driving word-formation described in chapter 2. As indicated, the extralinguistic factor, or, put differently, the component of "context" targeted in this case study is register. In order to develop a detailed analysis of the effect of register on word-formation, I have focused on one affix out of the set of nominalizing affixes, namely, deverbal nominalizations in -(t)ion, often referred to as action nominalizations, which involve the derivation of a noun from a verb, and denote an action or process. I begin by examining the information provided about the history of nominalization in -(t)ion from by the corpora (section 2). Section 3 investigates the role played by different registers in the productivity of -(t)ion.

I assess the integrity and usefulness of the category of "register" for the explanation of what promotes the production of action nominalizations (sections 4 and 5). I suggest that register is not in itself a sufficiently meaningful category for this aim, and that it is necessary to "unpack" register by examining the ways in which the discourse apparatus of individual texts promote new action nominalizations. For this it is necessary to review the functions of action
nominalization (section 6) and compare these identified functions to the purposes for which action nominalizations are coined or used in the ARCHER texts (sections 7 and 8).

2. Deverbal nominalization in –(t)ion in HCE and ARCHER

Koptjevskaja-Tamm follows Comrie (1976) in defining action nominals as “nouns derived from verbs ... with the general meaning of an action or process” (Koptjevskaja-Tamm 1993:5). Part of this definition is that they should show “reasonable productivity”. Koptjevskaja-Tamm points out that there are no obvious criteria for whether or not action nominals show “reasonable productivity”. The categorial status of action nominals can vary greatly across languages. Koptjevskaja-Tamm identifies two broad language groups: “In some of them, action nominals are treated morphologically as regular verb forms, in others they constitute a group of derived nouns with a number of idiosyncratic features” (1993:6).

Whether action nominals are classified as inflectional or derivational depends on the criteria employed for making this distinction. Koptjevskaja-Tamm reviews Anderson and Bybee’s respective classifications of English gerundive -ing. For Anderson (1985), the suffix brings about a change in word class and is therefore derivational although fully productive. For Bybee (1985), the suffix has full lexical generality, and is therefore bordering on inflectional. Chomsky (1970) argues that gerundive nominals in English do not have to be listed in the lexicon, but derived nominals do. –(t)ion, unlike –ing, cannot be generalised to all verb bases, and no case has been made for its inflectionality. Action nominalization is
nevertheless perceived as a highly productive process (Bauer 1983:221). This raises the questions: how can this productivity be quantified, and has \(-(t)ion\) been consistently highly productive? Even a superficial examination of the corpora used here reveals that the productivity of \(-(t)ion\) is considerably higher than other deverbal nominalizing suffixes, such as \(-ment\), and adjectival suffixes such as \(-ness, or \(-ity\).  

Let us briefly explore the history of the suffix prior to 1500. Dalton-Puffer chronicles an explosion of types ending in \-(a)cioun\ in the last section of the Middle English part of the Helsinki Corpus (1350-1420). There are 138 types in this section as opposed to 20 in ME2 (1250-1350) and and 4 in ME1 (1150-1250) (Dalton-Puffer 1996:94). Dalton-Puffer categorises formations in \-acioun\ according to their morphological make-up:

(i) verb: the verb base occurs in the Middle English Dictionary (MED) e.g. *vex/vexion*.
(ii) stem: the string before the suffix can be found as a part of other derivatives but not as an independent word in the MED. The stem can exist in verbs, e.g. *revolven/revolucion* or an adjectives or nouns e.g. *abominable/abominacion*.
(iii) PP: only the past participle form of the verb appears in the MED e.g *discreet/discrecioun*.
(iv) simplex: the base doesn’t appear in the MED, but has been borrowed subsequently, or, there is no way of determining whether there was such a base which escaped record. e.g. *meditate/meditacion* (1996:94-95).

\-(t)ion\ anglicizes Latin \-atio\ (after dropping the Latin inflectional ending e.g.

accusative *constrictionem*) as well as (learned) French \-ation\, but is now largely

---

1 Comparisons between affixes which are not functionally or semantically similar have little meaning, but comparison with \-ness\ and \-ity\ can nevertheless serve to illustrate quite simply that \-(t)ion\ is a remarkably productive suffix.
an independent suffix with impersonal deverbal substantives (Marchand 1969:259, Nevalainen forthcoming 7.4.3.1). But it is hard to pinpoint when items in -(t)ion were analysed as English derivations on the basis of borrowed pairs such as justify/justification, and organize/organisation. Marchand identifies a different rate of progress for different verbal bases. For nominalizations on verbs in -ify, every entry has a Latin or French counterpart, but this does not detract from the “derivative character” of the English substantives, which Marchand attributes to examples from the fifteenth century. Marchand is more certain about verbs in -ize. These form independent substantives from 1600, for example familiarization, authorization and colonization. For verbs ending in -ate, Marchand treats items from 1500 as English, for example education and alternation. Nominalizations in non-derived verb bases from the mid-fifteenth century are accompanied by older verbal loans and can be apprehended as English derivations, for example adoration, expectation, visitation. -(t)ion attaches almost exclusively to Latinate bases. Nevalainen comments that this lack of native bases makes it impossible to tell whether a given form in -(t)ion is the result of borrowing or deverbal derivation in Early Modern English (forthcoming, 7.5.3.1.4.)

---

2 Kastovsky argues that this word-formation rule must be represented in synchronic grammars as -ation, as it necessary to distinguish between nouns which presuppose a Latin or French original such as construction, action, revolution and conversion, and nouns produced by the English word-formation rule such as permutation, qualification and specification (1986:589, 1992b:291). Two examples from ARCHER suggest that -ification and -ization may have formed independent units. Rustification occurs instead of rustication, in the Manchester Guardian in 1959 (news). Rustification is not in the OED. Privatization, which appears in The Times in 1989, is first cited in 1959 in the OED. The verb privatize, however, is first cited in 1969.
I have indicated that in the present study no attempt is made to disregard items that might be loanwords rather than English derivations. Given Marchand’s datings this is probably appropriate. This approach also allows for the inclusion of Latinate coinings, for example *fecundation*, which appears in ARCHER and according to the OED is a Latinate coining from the Latin verb *fecundare*.


We know from Dalton-Puffer’s study that there was an increase in items in -(t)ion in the period 1350-1420. Marchand’s account suggests that the affix is subsequently productive on a variety of non-native bases. The measurement of the productivity of the affix from 1500 may then reveal whether its productivity has remained constant or continued to increase.

Tables 1 and 2 show the token and type frequencies of -(t)ion per 100 000 words in the HCE and ARCHER and corpora, and Table 3 shows the frequency of new types in -(t)ion per 100 000 words, for ARCHER with the HCE starting lexicon. The results are graphically illustrated in Figures 1 and 2.

<table>
<thead>
<tr>
<th>Table 1 Types in -(t)ion per 100 000 words in HCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
</tr>
<tr>
<td>Types</td>
</tr>
<tr>
<td>Tokens</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2 Types in -(t)ion per 100 000 words in ARCHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types</td>
</tr>
<tr>
<td>Tokens</td>
</tr>
</tbody>
</table>

3 The raw figures are available in Appendix 1.
Figure 1: Types in -(t)ion per 100,000 words in ARCHER

Type frequency per 100,000 words for -(t)ion in ARCHER

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Table 3: New types in -(t)ion per 100,000 words in ARCHER with HCE starting lexicon

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-(t)ion</td>
<td>80.2</td>
<td>54</td>
<td>48</td>
<td>42.9</td>
<td>31.6</td>
<td>38.6</td>
<td>39.3</td>
</tr>
</tbody>
</table>

Figure 2: New types in -(t)ion per 100,000 words in ARCHER

Percentage of new types in -(t)ion for ARCHER
For the type frequency measure, we find the consistent aggregation that might be
expected from a productive process from 1500 until 1750 (viewing the two corpora
continuously). The type frequency per 100,000 words for ARCHER 1650-1700
corresponds fairly closely to the type frequency per 100,000 words for HCE 1640-1710,
further confirmation of this increase. After 1700 however, the subperiods of ARCHER
increase only alternately. A potential cause of this “half-century” effect may be that the
periods which consist of British and American texts (the last half-centuries of ARCHER
(1750-1800, 1850-1900 and 1950-1990) are less productive than the remaining periods
which have British texts only. I have checked this by obtaining separate measurements of
the British and American texts in these subperiods. The results are presented in Table 4:

<table>
<thead>
<tr>
<th>Year</th>
<th>British</th>
<th>American</th>
<th>British</th>
<th>American</th>
<th>British</th>
<th>American</th>
</tr>
</thead>
<tbody>
<tr>
<td>1750-1900</td>
<td>219.6</td>
<td>186.3</td>
<td>211.2</td>
<td>200.1</td>
<td>187.8</td>
<td>215.5</td>
</tr>
</tbody>
</table>

Biber records suggestions that there is a greater tendency to use nominalizations in
American English in a review of the literature on differences between British and
American writing (1987:100). On the basis of Table 4, this is true only of the twentieth
century. For the last half of the eighteenth century, British texts have the higher type
frequency.

The “half-century effect” is not however repeated for new types. There are some
further observations that can be made about new type frequency. First, new type
frequency seems to decrease, possibly levelling out to a constant rate. From 1750, for the
last 5 periods, each period does not differ from its neighbours by more than 10. Between
1900-1950 and 1950-1990, the difference is less than 1. The irregular period is 1850-1900, in which productivity dips. Otherwise productivity appears to be fairly constant. Notice, however, the 26.2 difference between 1650-1700 and 1700-1750. This may be due to the “decreasing effect” for small corpora described in the previous chapter, despite the use of a starting lexicon consisting of the first two periods of HCE. But the new type frequencies for HCE militate against a reading of this “decreasing effect”. The figure for 1640-1710 with the same starting lexicon is 73.1., and the 68.5 figure for 1570-1640 using just the first period of HCE (1500-1700) as a starting lexicon, suggests an increase in the late seventeenth century.

Let us turn to the new types data in its non-normalised form. Table 5 shows the percentage of new types out of the total number of types for ARCHER, using the HCE starting lexicon. The percentages are graphically represented in Figure 3, and the proportions yielding these percentages are graphically represented in Figure 4.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-(t)ion</td>
<td>42.4</td>
<td>26.7</td>
<td>31.3</td>
<td>19.4</td>
<td>19.4</td>
<td>15.8</td>
<td>23.1</td>
</tr>
</tbody>
</table>
Figure 3 Percentage of new types out of the total number of types in ARCHER with HCE starting lexicon

**Percentage of new types in -tion for ARCHER**

- percentage

Figure 4 Proportion of new types out of total types for ARCHER with HCE starting lexicon*

**Proportion of new types for -(t)ion in ARCHER**

- old types  ■ new types

* A chi square test shows that these proportions are not evenly distributed across the periods, for a significance level of $p \leq 0.05$. Pearson correlations show a negative correlation between period and percentage of new types, but this is not statistically significant.

The shape of the graph for the percentage of new types appears similar to the shape of the graph for the new types per 100 000 words, in that the most prominent difference
(15.7%) is between the first two periods of ARCHER. However, the difference between 1750-1800 and 1800-1850, 11.9%, is not that much less. There is no way of knowing whether one or both are a significant difference, as the chi square test will only tell us that the new types are not evenly distributed across periods. In Figure 3 the percentage of new types for 1750-1800 is higher than that for 1700-1750, disrupting what might otherwise be a consistent decrease. The percentage differences become smaller and the two halves of the nineteenth century are identical. The result for 1750-1800 may be attributed (as for the type frequency measure) either to regional differences (the combined texts being more productive this time) or to the probability of a greater sample size picking up more rare types. The same explanation might be offered for the 1950-1990 result, which differs from 1900-1950 by 7.3%. Yet 1850-1900 does not show this effect at all, and it happens to be the largest sample by approximately 50,000 words, which makes at least the sample size theory questionable. Finally, I will note that on the basis of this proportional measure, the periods 1650-1700, 1750-1800 and 1950-1990 are the highly productive ones for action nominalization.

3. Deverbal nominalizations in -(t)ion across registers

In the previous chapter I described two possible ways of measuring the productivity of individual registers. I argued that an approach that identifies which registers contribute the types that are new in each period of the entire corpus, is preferable to an approach which treats each register as an individual corpus. I also noted that the only corpus used for the comparison of registers is ARCHER, in order to avoid debates about the extent to which registers/text types in the two

---

4 There is however no statistical correlation between percentage of new types and sample size.
corpora are compatible. The breakdown according to register for the new types in each period is given in Table 7 below:

Table 7 Distribution of new types in -(*it)ion across registers in ARCHER*

<table>
<thead>
<tr>
<th>Period</th>
<th>Total</th>
<th>Dram</th>
<th>Fict</th>
<th>Journ</th>
<th>Legal²</th>
<th>Letter</th>
<th>News</th>
<th>Scienc</th>
<th>Medic</th>
<th>Serm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>130</td>
<td>5</td>
<td>12</td>
<td>5</td>
<td>-</td>
<td>4</td>
<td>11</td>
<td>28</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>1700-</td>
<td>94</td>
<td>3</td>
<td>11</td>
<td>4</td>
<td>-</td>
<td>5</td>
<td>0</td>
<td>18</td>
<td>28</td>
<td>8</td>
</tr>
<tr>
<td>1750-</td>
<td>167</td>
<td>9</td>
<td>29</td>
<td>5</td>
<td>17</td>
<td>11</td>
<td>15</td>
<td>13</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>1800-</td>
<td>97</td>
<td>2</td>
<td>12</td>
<td>3</td>
<td>7</td>
<td>6</td>
<td>13</td>
<td>15</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>1850-</td>
<td>127</td>
<td>1</td>
<td>10</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>10</td>
<td>16</td>
<td>42</td>
<td>5</td>
</tr>
<tr>
<td>1900-</td>
<td>75</td>
<td>3</td>
<td>9</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>19</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>1950-</td>
<td>137</td>
<td>7</td>
<td>15</td>
<td>0</td>
<td>11</td>
<td>6</td>
<td>27</td>
<td>22</td>
<td>13</td>
<td>7</td>
</tr>
</tbody>
</table>

* raw figures

The figures given for individual registers in each period do not add up to the total number of new types for each period, as I have excluded those items which appear in more than one register. These items are in any case unlikely to be new in the language, since use in more than one register suggests sufficient time to spread, which would mean that the item is less likely to be new outside the corpus. But this is not necessarily so. First, some of the many combinations, for example science and medicine, still suggest quite a specialised use. I have not been able to represent all the different combinations of registers here as these are too various, and there do not appear to be dominant combinations. Second, it is not really possible to establish how quickly an item can spread. This may be almost immediate with one writer reading another writer’s text. In Table 8 below,

---

5 The legal register is excluded because legal documents are not included in the first two periods of ARCHER.
I show the numbers of new types which occur in more than one register, and what percentage they constitute of the total number of new types for that period:

Table 8 New types in -(it)ion appearing in more than one register

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New types</td>
<td>52</td>
<td>17</td>
<td>55</td>
<td>13</td>
<td>27</td>
<td>6</td>
<td>29</td>
</tr>
<tr>
<td>% of total</td>
<td>40%</td>
<td>18.1%</td>
<td>32.9%</td>
<td>13.4%</td>
<td>21.3%</td>
<td>8%</td>
<td>21.2%</td>
</tr>
</tbody>
</table>

We can note from Table 8 that the highly productive periods seem to have higher percentages of these items, especially the first period. This includes the 1850-1900 period, suggesting that the larger samples captured a lot of older types which were not eliminated by the new types measure, and the starting lexicon. This serves as a caution to any conclusions about high productivity for certain periods in the overall measures. But let us press on with the contributions of individual registers, which are not skewed by new types that appear in more than one register. If the new types belonging to a single register are normalised to 100 000 words, as in Table 9, we can rank them in order of the most contributions to new types for the corpus, in Table 10, below:

Table 9 Distribution of new types in -(it)ion per 100 000 words across registers in ARCHER

<table>
<thead>
<tr>
<th>Period</th>
<th>New types across registers</th>
<th>Dram</th>
<th>Fict</th>
<th>Journ</th>
<th>Legal</th>
<th>Letter</th>
<th>News</th>
<th>Science</th>
<th>Medic</th>
<th>Serm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>15</td>
<td>9.6</td>
<td>22.8</td>
<td>-</td>
<td>29.6</td>
<td>44.6</td>
<td>147.9</td>
<td>110.3</td>
<td>35.3</td>
<td></td>
</tr>
<tr>
<td>1700-</td>
<td>20.8</td>
<td>24.9</td>
<td>18.3</td>
<td>-</td>
<td>35.4</td>
<td>0</td>
<td>83.4</td>
<td>163.7</td>
<td>74.4</td>
<td></td>
</tr>
<tr>
<td>1750-</td>
<td>20.8</td>
<td>32.1</td>
<td>11.2</td>
<td>39</td>
<td>44.4</td>
<td>30.7</td>
<td>61.6</td>
<td>100.3</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>1800-</td>
<td>6</td>
<td>20.5</td>
<td>13</td>
<td>20.5</td>
<td>41.1</td>
<td>55.8</td>
<td>69.7</td>
<td>90.7</td>
<td>17.8</td>
<td></td>
</tr>
<tr>
<td>1850-</td>
<td>1.4</td>
<td>11.2</td>
<td>14.3</td>
<td>3.4</td>
<td>38.2</td>
<td>21.8</td>
<td>70.7</td>
<td>85.2</td>
<td>22.5</td>
<td></td>
</tr>
<tr>
<td>1900-</td>
<td>11.5</td>
<td>18.3</td>
<td>0</td>
<td>22.8</td>
<td>14.9</td>
<td>44.6</td>
<td>83.8</td>
<td>91.1</td>
<td>18.4</td>
<td></td>
</tr>
<tr>
<td>1950-</td>
<td>10.4</td>
<td>14</td>
<td>0</td>
<td>42</td>
<td>21.9</td>
<td>52.9</td>
<td>94.7</td>
<td>135</td>
<td>33.2</td>
<td></td>
</tr>
</tbody>
</table>
From the ranking in Table 10, it is evident that medicine and science consistently produce more new types in -(t)ion than the other registers. At the other end of the scale, drama and journals tend to produce the least. The remaining registers variably occupy ranks 3 to 7, making generalisation difficult. Letters, legal and news seem to be higher on the whole than sermons and fiction. These results will receive further consideration in the remainder of this chapter, as I seek explanations for the performance of different registers with regard to action nominalization.

4. Nominalization and dimensions of register variation

ARCHER is constructed to allow for the exploration of a written/spoken, or oral/literate dichotomy between registers, as well as a formal/informal dichotomy.

The registers fall along these spectra as follows:

ARCHER contains texts of ten registers, three of them speech-based. Among the written registers, both formal and informal writing are represented. At the more informal end are Journals-Diaries and Letters, while the more formal end is represented by Legal opinions, Medical research articles and Science. Between these poles are Fiction and News. Likewise, speech-based registers are represented by Sermons-Homilies at the more formal end and by Fictional conversation and Drama at the less formal end. (Biber, Finegan and Atkinson 1994:3)
Research on ARCHER (Biber et al 1994, Biber and Finegan 1997) has, through multidimensional analyses of co-occurring linguistic features demonstrated that the registers of the corpus have changed over time. Dimensions of variation consist of groups of linguistic features which tend to co-occur. Five of the dimensions obtained through factor analysis (see Biber 1988, 1995 for a detailed account of this methodology) are: involved versus informational production, narrative versus non-narrative concerns, situation-dependent versus elaborated reference, overt expression of persuasion, and non-personal versus personal style.

Each dimension has positive features and negative features. A preponderance of features in either set results in a tendency towards one end of a scale. I will not reproduce the list of features associated with each dimension, as these are extensive. The linguistic features I would like to highlight are the frequency of nouns and the frequency of nominalizations. A high frequency of nouns is associated with informational rather than involved production, and a high frequency of nominalizations is associated with elaborated rather than situation-dependent reference.

Biber, Finegan and Atkinson (1994), in their preliminary findings, demonstrate that drama, letters and journals become increasingly “involved” from the seventeenth century to the twentieth century. Medical writing, on the other hand, becomes increasingly “informational”. These patterns, say the authors, “suggest the existence of a fundamental split between specialist professional registers and more popular written (as well as speech-based registers)” (1994:8).
Biber and Finegan (1997) report that the expository written registers (medical research writing, science research writing, legal prose and news reportage) shift towards more informational production and elaborated reference. The speech-based and non-expository written registers (drama, sermons, diaries, letters and fiction) show a general trend towards more involved production and situated reference, except for sermons\(^6\). The changes undergone by news reportage and fiction are however somewhat more complex:

Over the four centuries represented in ARCHER, fiction and news reportage became increasingly different from medical, science and legal prose in their intended audience. That is, fiction and news reportage become popular registers, appealing to an increasingly wider readership across the centuries. In contrast, medical, science and legal prose developed to become highly specialized registers, accessible to a progressively narrow audience and requiring extensive specialist background knowledge for comprehension. (Biber and Finegan 1997:269)

Biber and Finegan conclude that these specialist expository registers have consistently followed a tendency to ever more “literate” styles. These specialist registers “have come to exploit the resources of the written mode in innovative ways, resulting in style of discourse not previously attested” (1997:273).

From these results it can be inferred that in medical research writing, science research writing, legal prose and news reportage, there is an increase in the frequency of nominalizations and in the frequency of nouns, along with increases in the frequency of the other linguistic features associated with involved production and elaborated reference.

Frequency counts for individual linguistic features are not given in Biber and Finegan (1997), but Biber (1988) provides details about how the frequencies

\(^6\) There is unfortunately no discussion of sermons as an exception to this tendency.
of individual linguistic features are obtained. For nominalizations, tokens of
nominalizations in -(t)ion -ness, -ity and -ment are counted and and the figure is
normalized. The fact that tokens are counted rather than types means that these
data cannot be viewed as a direct indicator of productivity. Although Biber and
Finegan are not measuring the productivity of nominalizations, it is perhaps not so
surprising in the light of their results that new action nominalizations in the
present study tend to occur chiefly in scientific and medical writing - the written,
expository, specialised registers.

No systematic changes in the ranking of registers over time are observable
in Table 10. From this table it is clear that in terms of action nominalization,
medical and scientific writing were already, from the seventeenth century,
considerably more nominalizing than other registers.

The ARCHER studies provide some idea of what linguistic features co-
occur with nominalizations, and of changes in the registers that produce the most
nominalizations in -(t)ion. My question is: how much can these tendencies and
shifts tell us about motivations for using an action nominalization? My first step
will be to explore the notion of “nominal style”. Texts which have a high
frequency of nouns, and exhibit other features of “informational” production are
described as having a “nominal style” (Biber 1988:108; Atkinson 1996:351).
Biber views nominal versus verbal style as one of the dimensions which anticipate
the informational versus involved production dimension. Both Biber and Atkinson

\footnote{It is not possible to compare the figures for an individual register over time in Table 9. The number of
new types contributed by different registers within a period can be compared, but the total number of new
types for each period is based on different sample sizes.}
refer to an article by Wells, who defines nominal (or nominalizing) style as "the
tendency to use nouns in preference to verbs" (1970:298).

Wells does not specifically state that derived nominalizations contribute to
a nominal style. I assume that he includes derived nominalizations, given that the
only question he raises about noun status is with regard to non-finite forms such
as gerunds and infinitives. Wells makes some brief suggestions about
quantification, positing a noun-word quotient, as opposed to a verb-word quotient.
He suggests that the existence of an inverse relationship between these two
quotients is a topic for future research.

The quantification of nominal style raises some interesting questions.
Biber excludes nominalizations from the total noun count, in order for the
measures to be statistically independent. In a study which just counts
nominalizations, such as the present one, the results obtained for the frequency of
nominalizations are vulnerable to suggestions that the measure is not statistically
independent of the number of nouns in the text. In other words, it could be
suggested that a text has a high number of nominalizations because it has a high
number of nouns. Even if this was the case, it is not clear that the findings with
regard to nominalizations would be invalidated. But it is important to
acknowledge that here we are describing one part of a broader stylistic inventory.
Furthermore, we are concerned here with the frequency of nominalization types,
not the frequency of nominalization tokens, which may be more dependent on the
frequency of noun tokens than nominalization types.
Biber has not commented explicitly on the relationship between nouns and nominalizations, and his interpretation of the co-occurrence of nouns with features of informational production, and the co-occurrence of nominalizations with features of elaborated reference is not detailed. We are told that a high frequency of nouns indicates “great density of information” because nouns are the primary bearers of referential meaning in a text (Biber 1988:104). The co-occurrence of nominalizations and phrasal co-ordination “indicates that referentially explicit discourse also tends to be integrated and informational” (1988:110). Nominalizations, like nouns, are therefore informational, but they also reflect integration, which is perhaps the same as cohesion, discussed in section 6. The function of nominal style, according to Wells (1970), is to create impersonality, as does the use of the passive voice. Wells’ suggestion is useful, as the association between nominalizations and the passive voice is not always made in the multi-dimensional analysis if these two features do not co-occur in a factor.

The question of whether it is possible to find nominal style without nominalizations (or, can a text be informational without elaborated reference and integration?) is partially answered in an essay by Halliday (1970), where Halliday demonstrates that verbs in Yeats’ poem, *Leda and the Swan*, are “rankshifted” to other parts of speech. The verbs appear predominantly in the form of participles in the nominal group, for example, “the staggering girl”, but there are no derived nominalizations in the poem. A study of one poem does not answer our question, of course, but it is interesting that Halliday mentions that this kind of writing is typical of scientific texts, and unusually exploited in the poem.
Wells claims that nominal style "sets off the writing as esoteric, specialized, technical. Nominal style in English can be used to play the role (although much less conspicuously and effectively) that Latin played several hundred years ago" (1970:303). Recognising that nominal style might be consciously used to create a desired effect is different to assuming that specialised discourse is naturally or inadvertently esoteric and specialised. Wells’ comments imply that the nominalization process can render that which is ordinary and familiar, esoteric and technical in a particular context.

5. The composition of registers and the need for textual analysis

The exploratory studies of ARCHER discussed in section 4 present evidence that the registers of ARCHER change over time. Indeed, the corpus was constructed in order to allow for such a study. This does mean, though, that there is a danger of assuming that the texts of a register for a single time period will be homogeneous in terms of style. There is no reason to assume this, as texts are classified into registers in ARCHER purely on the basis of situational features such as content, audience, publication, or even their listing in a database (see Biber, Finegan and Atkinson 1994).

There are some facts that can be obtained at the outset about the homogeneity of texts in the ARCHER registers by looking at the composition of corpus. For example, we might speculate that scientific writing is likely to be a more homogenous register because the texts, for all periods, are taken from the same journal. Yet this journal, the Philosophical Transactions of the Royal
Society, has become more homogeneous over time, and the early texts are diverse. The seventeenth century volumes feature a very wide range of topics, from records of the weather to descriptions of naturalists’ walks (Atkinson 1996). The medical writing is taken from a variety of journals. Many of these medical texts are case studies, which are essentially narrative, and others are theoretical research articles.

In a study of an individual linguistic feature, such as the present one, it is necessary to investigate the homogeneity of texts in a cell, at least in terms of that particular feature, in order to have some sense that “register” is a useful generalised category for analysing the feature, here, nominalisation. In other words, we must check that the level of nominalizations measured for a register for a period is evenly distributed among the texts of that cell.

It is impossible to show breakdowns for all the texts in the corpus, but I will demonstrate this problem by taking three cells from the 1750-1800 period (arbitrarily chosen), namely the drama, sermons and medical registers (all of which perform quite differently for action nominalizations in -(t)ion), and breaking them down into their component texts. The exercise is complicated by the fact that it is possible to obtain only a type frequency measure of individual texts, as a new type frequency for a cell would be fairly meaningless. It is also not possible to compare the type frequency of a text to the type frequency of that cell, as the type frequency of the cell reflects the number of types in all of the texts combined. Individual texts may have much higher type frequencies than the type frequency for the cell, if the types for individual texts tend to be repeated in other
texts in that cell. Even though type frequency is not an optimal measure of productivity, some useful information about the homogeneity of texts in a cell in terms of nominalization can be gained from a comparison of the type frequencies of texts in a cell, shown in Table 11, below. I have also provided an indication of the number of new types contributed by each text to the overall new types given in Table 7.

Table 11 Type frequency for individual texts in ARCHER

**Drama 1750-1800: type f per 1000 words for cell = 3.1**

<table>
<thead>
<tr>
<th>Text</th>
<th>Types per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1753 Foote, The Englishman in Paris</td>
<td>4</td>
</tr>
<tr>
<td>1766 Garrick, The country girl</td>
<td>2</td>
</tr>
<tr>
<td>1770 Munford, The Candidates</td>
<td>3.9</td>
</tr>
<tr>
<td>1775 Kelly, The School for Wives</td>
<td>8.6</td>
</tr>
<tr>
<td>1776 Franklin, The Contract</td>
<td>2.5</td>
</tr>
<tr>
<td>1776 Leacock, The Fall of British Tyranny</td>
<td>7.8</td>
</tr>
<tr>
<td>1780 Pilon, The deaf lover</td>
<td>0.8, new types: 1</td>
</tr>
<tr>
<td>1785 MacNally, Fashionable Levities</td>
<td>7.5, new types: 1</td>
</tr>
<tr>
<td>1786 Cowley, A School for Greybeards</td>
<td>3.1</td>
</tr>
<tr>
<td>1787 Tyler, The contrast</td>
<td>5.4, new types: 1</td>
</tr>
<tr>
<td>1789 Low, The Politician Outwitted</td>
<td>9.7, new types: 2</td>
</tr>
<tr>
<td>1792 Holcroft, The road to ruin</td>
<td>2.6, new types: 1</td>
</tr>
<tr>
<td>1792 Macklin, The man of the world</td>
<td>8.7</td>
</tr>
<tr>
<td>1799 Dunlap, False Shame</td>
<td>4.8, new types: 2</td>
</tr>
</tbody>
</table>

**Sermons 1750-1800: type f per 1000 words for cell = 9.3**

<table>
<thead>
<tr>
<th>Text</th>
<th>Types per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1750(?), Whitefield, The Method of Grace</td>
<td>5.3</td>
</tr>
<tr>
<td>1750. ff. Wesley, God's Love to Fallen Man</td>
<td>9.3</td>
</tr>
<tr>
<td>After 1750 Sterne, The Prodigal Soff</td>
<td>10.1</td>
</tr>
<tr>
<td>1750 Edwards, A Farewell Sermon</td>
<td>11</td>
</tr>
<tr>
<td>1762 Bellamy, An Election Sermon</td>
<td>4.7, new types: 1</td>
</tr>
<tr>
<td>1779 Armstrong, Righteousness Exalteth a Nation</td>
<td>15.1, new types: 1</td>
</tr>
<tr>
<td>1780-9 Archer, On the Effects Produced by a worthy Participation of the Sacred Mysteries</td>
<td>10.1</td>
</tr>
<tr>
<td>1781 Blair, The Hour and Event of All Time</td>
<td>14.7, new types: 2</td>
</tr>
<tr>
<td>1789 Hopkins, The Decrees of Good the Foundation of Piety</td>
<td>7, new types: 1</td>
</tr>
<tr>
<td>1789 Emmons, The Gospel a Scheme of Grace</td>
<td>9.6, new types: 1</td>
</tr>
</tbody>
</table>
texts in that cell. Even though type frequency is not an optimal measure of productivity, some useful information about the homogeneity of texts in a cell in terms of nominalization can be gained from a comparison of the type frequencies of texts in a cell, shown in Table 11, below. I have also provided an indication of the number of new types contributed by each text to the overall new types given in Table 7.

Table 11 Type frequency for individual texts in ARCHER

**Drama 1750-1800:** type f per 1000 words for cell = 3.1

<table>
<thead>
<tr>
<th>Text</th>
<th>Types per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1753 Foote, The Englishman in Paris</td>
<td>4</td>
</tr>
<tr>
<td>1766 Garrick, The country girl</td>
<td>2</td>
</tr>
<tr>
<td>1770 Munford, The Candidates</td>
<td>3.9</td>
</tr>
<tr>
<td>1775 Kelly, The School for Wives</td>
<td>8.6</td>
</tr>
<tr>
<td>1776 Franklin, The Contract</td>
<td>2.5</td>
</tr>
<tr>
<td>1776 Leacock, The Fall of British Tyranny</td>
<td>7.8</td>
</tr>
<tr>
<td>1780 Pilon, The deaf lover</td>
<td>0.8, new types: 1</td>
</tr>
<tr>
<td>1785 MacNally, Fashionable Levities</td>
<td>7.5, new types: 1</td>
</tr>
<tr>
<td>1786 Cowley, A School for Greybeards</td>
<td>3.1</td>
</tr>
<tr>
<td>1787 Tyler, The contrast</td>
<td>5.4, new types: 1</td>
</tr>
<tr>
<td>1789 Low, The Politician Outwitted</td>
<td>9.7, new types: 2</td>
</tr>
<tr>
<td>1792 Holcroft, The road to ruin</td>
<td>2.6, new types: 1</td>
</tr>
<tr>
<td>1792 Macklin, The man of the world</td>
<td>8.7</td>
</tr>
<tr>
<td>1799 Dunlap, False Shame</td>
<td>4.8, new types: 2</td>
</tr>
</tbody>
</table>

**Sermons 1750-1800:** type f per 1000 words for cell = 9.3

<table>
<thead>
<tr>
<th>Text</th>
<th>Types per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1750(?) Whitefield, The Method of Grace</td>
<td>5.3</td>
</tr>
<tr>
<td>1750. ff. Wesley, God’s Love to Fallen Man</td>
<td>9.3</td>
</tr>
<tr>
<td>After 1750 Sterne, The Prodigal Son</td>
<td>10.1</td>
</tr>
<tr>
<td>1750 Edwards, A Farewell Sermon</td>
<td>11</td>
</tr>
<tr>
<td>1762 Bellamy, An Election Sermon</td>
<td>4.7, new types: 1</td>
</tr>
<tr>
<td>1779 Armstrong, Righteousness Exalteth a Nation</td>
<td>15.1, new types:1</td>
</tr>
<tr>
<td>1780-9 Archer, On the Effects Produced by a worthy Participation of the Sacred Mysteries</td>
<td>10.1</td>
</tr>
<tr>
<td>1781 Blair, The Hour and Event of All Time</td>
<td>14.7, new types:2</td>
</tr>
<tr>
<td>1789 Hopkins, The Decrees of Good the Foundation of Piety</td>
<td>7, new types: 1</td>
</tr>
<tr>
<td>1789 Emmons, The Gospel a Scheme of Grace</td>
<td>9.6, new types: 1</td>
</tr>
</tbody>
</table>
Medical 1750-1800: type f per 1000 words for cell = 5.5

<table>
<thead>
<tr>
<th>Text</th>
<th>Types per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1775 Bothwick, The history of a fractured sternum</td>
<td>9.1</td>
</tr>
<tr>
<td>1775 Carmichael, The history of a case in which the left arm of a</td>
<td>17.9, new types:2</td>
</tr>
<tr>
<td>child was torn off by a mill …</td>
<td></td>
</tr>
<tr>
<td>1775 Clarke, The history of a case of an obstructed secretion of</td>
<td>18.9, new types: 3</td>
</tr>
<tr>
<td>urine</td>
<td></td>
</tr>
<tr>
<td>1775 Hall, .. a letter … giving an account of a new species of</td>
<td>7</td>
</tr>
<tr>
<td>palsy</td>
<td></td>
</tr>
<tr>
<td>1775 Houlton, Observations on mineral poisons</td>
<td>7.5</td>
</tr>
<tr>
<td>1775 Johnson, … the internal use of the vitriolum Album</td>
<td>13.6, new types: 1</td>
</tr>
<tr>
<td>1775 Leith, The history of an uncommon cough</td>
<td>3.1</td>
</tr>
<tr>
<td>1775 Mills, An account of the dissection of an extraordinary</td>
<td>11.2, new types: 1</td>
</tr>
<tr>
<td>tumour</td>
<td></td>
</tr>
<tr>
<td>1775 Scott, History of a case in which obstinate affections of the</td>
<td>8.5</td>
</tr>
<tr>
<td>intestines were radically cured …</td>
<td></td>
</tr>
<tr>
<td>1775 Scott, The history of an uncommon case in midwifery</td>
<td>11.4</td>
</tr>
</tbody>
</table>

Of the 14 texts for drama, 8 fall into a 0-5 interval and 6 into a 5-10 interval. Of the 10 texts for sermons, 1 falls into a 0-5 interval, 4 fall into a 5-10 interval, and 5 fall into a 10-15 interval. Of the 10 texts for medical, 1 falls into a 0-5 interval, 4 fall into a 5-10 interval, 3 fall into a 10-15 interval, and 2 fall into a 15-20 interval. Drama is spread over a 5-10 range, and medical and sermons would both be spread over a 5-15 range, were it not for two higher scoring texts in medical.

These are also the texts in which the concentration of new types for that cell can be found.

It is interesting that the most productive register in terms of new types (medical) contains texts which are widely divergent in terms of type frequency. Particular medical texts have comparatively very high type frequencies. The type frequencies of texts for sermons and drama are also divergent, but on the basis of the range of type frequencies, texts in drama, sermons and medicine for 1750-1800 seem to be more divergent in that order. New types seem to be evenly spread across the texts of the registers, in other
words, in none of the registers do we have a situation where one text is producing all the new types.

A breakdown of three cells cannot conclusively show that register is a meaningful independent variable for nominalizations, but it does highlight the need for an examination of the individual texts which comprise a register. We know that even a single text can contain different styles or modes. For instance, a text might begin with a narrative, and end with a theoretical explication, or a moral lesson. I propose therefore to investigate these “nominalizing” registers, which may demonstrate considerable variation, through a discourse analysis of nominalizations in their contexts of occurrence. My goal is a better understanding of how the apparatus of a text promotes neologising. In this way we can see how the conditions of the production of action nominalizations in -(t)ion in ARCHER correspond to concepts emerging from the discussion in section 4, such as “informational”, “integrated”, “esoteric”, “technical”.

Corpus linguistics has tended to omit such textual analysis. The Helsinki Corpus has primarily been used for quantificational studies of grammatical variants, which are conditioned by social factors. There is little need for close analysis of the texts in which those grammatical constructions occur, as a few selected examples are sufficient to illustrate the grammatical function of the construction in question.8

Multidimensional analyses of register variation are concerned with the co-occurrence of a wide range of linguistic features (lexical and grammatical), yet

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8 See for instance Rissanen, Kyö and Pallander-Collin (1993) for studies based on the Helsinki Corpus, and Nevalainen and Räme lin-Brunberg (1996) for studies based on the Corpus of Early English Correspondence.
textual analyses are scarce. Biber’s analysis has been described as “across representative samples of genres and sub-genres, with no analysis of the discourse structure of individual instances of the genres.” (Stubbs 1996:34). Stubbs argues strongly for an integration of textual analysis and corpus linguistics. “The most powerful interpretation emerges,” he says, “if comparisons of texts across corpora are combined with the analysis of the organization of individual texts” (ibid.). Jucker’s (1992) study of the complexity of noun phrases in British newspapers comes in for similar criticism:

Jucker provides no semantic information on the NPs ... second, the corpus is not in fact a sample of texts, but the list of NPs, extracted and studied independently of their co-text ... Jucker studies the NPs in the context of type of publication (up- and down- market) and text type (e.g. sports versus arts section), but he ignores the data needed to interpret the isolated grammatical constructions. Since he ignores the intervening layers of sentence and text, he cannot explain how such NPs are used to construct arguments. (Stubbs 1996:16-17)

This raises the question of whether it counts as explanation to identify the frequency of certain syntactic constructions in different text types, without really assessing their function in those text types. Jucker does provide some analysis of the semantic functions of these NPs, but it is difficult to gain a sense of why certain text types produce certain constructions. These points are particularly relevant to the present study, where there is also a danger of treating the instances of the construction, in this case derived nominalizations, as the corpus. In the same way that the stylistic analysis of individual texts is much more powerful when based on comparisons with other texts and corpus data (Stubbs 1996:5), the

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9 Although subsequently Biber and Finegan (1997) have contrasted paired texts from earlier and later drama, medical prose and news reportage to illustrate the changes that take place within these registers.
findings of corpus surveys are weakened in the absence of textual analysis. The next section will be devoted to developing a model for the analysis of nominalizations in discourse.

6. A model of nominalization in discourse

6.1. Lexis and textual analysis

Studies of lexis in context present a likely model for the textual analysis of derivations, if derivations are regarded as lexical items rather than grammatical constructions. I refer to studies such as Williams (1976) which documents the histories of culturally salient lexical items, many of them abstract nouns (some derived nominalizations) denoting concepts the meaning of which tends to be contested and re-negotiated in society. Then there are numerous studies of lexical items in semantic fields, for example Hughes (1988), which explores fields such as “conquest” and “capitalism”. As far as the first kind of study is concerned, it is crucial to have a sense of the social and cultural significance of an individual derivation, when analysing it in a text. However, here I am more interested in a model which will allow me to make some useful generalisations about the discourse functions and stylistic associations of action nominalization as a process. As I have suggested, the study of derivation tends to be avoided by sociolinguists because

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10 Stubbs also argues that textual analysis should not be based on text fragments that are too short (1996:5), although he doesn’t offer any specific guidelines about length. The excerpts in ARCHER vary in length considerably but many of them are dramatically shorter than texts in HCE. Length often seems to depend on the text however. Letters, often short, are incorporated in their entirety, likewise some of the early medical and scientific journal articles.

11 Certain nominalizations which appear in these corpora could easily be the subject of book length studies, for example nationalization in 1960s Britain and privatization in 1980s Britain, also, colonialism and racism, pejorative products of the -ism suffix.
derivations are perceived as too idiosyncratic to be studied as a stylistic, social or cultural practice.

The first level at which deverbal nominalization in -(t)ion can be said to have stylistic and social associations is its membership of the non-native stratum of English word-formation. Even Modern English is described as having a institutionalized split in vocabulary: “speakers in different social class groups have differential access to the non-core vocabulary. This is due to the way in which Graeco-Latin loan words have been used to build up the vocabularies of institutions such as religion, medicine and the law.” (Stubbs 1996:70-71). Of these institutions, we have found medicine to be productive for action nominalizations in -(t)ion, law moderately so, and sermons not. Yet sermons have high type frequencies. If we compare the text in drama with the highest type frequency (Low) to that with the lowest type frequency (Pilon), we see that there are clear class differences among the characters. Low’s characters are learned gentlemen, and classical references and Latinate vocabulary abound. Pilon’s characters are soldiers, servants and a “flower-girl”. The type frequency of action nominalizations may well be related to class, and this is an aspect I have not been able to explore in this study. But this high type frequency does not necessarily imply productivity. There is generally a difference between using Latinate vocabulary as a marker of social status, and coining new words as part of a knowledge-building and conceptual process. The first practice is related to word-formation as a marker of register, which I discuss in section 7.

The explanatory framework for the creation of derivations in discourse that I will draw on primarily is that of “lexicogrammar”, which emphasizes the interrelationship of lexis and grammar (Halliday 1994). I am particularly
interested in the notion of "grammatical metaphor": "in grammatical metaphor, instead of a lexical transformation (of one word to another) the transformation is in the grammar – from one class to another, with the word ... remaining the same" (Halliday and Martin 1993:13). For example, the derivation of *happiness* from *happy* involves a transition from a "quality" (adjective) to an abstract thing (nominalization). States are typically encoded as adjectives but can be "re-coded" as nouns: "a state can be grammaticalized as a thing" (Stubbs 1996:86-87). Nominalization plays a central role in Halliday and Martin’s style of textual analysis, and is the most prominent exemplar of grammatical metaphor. The framework as it is presented here has been developed with regard to scientific discourse, but could potentially be generalised to other discourses in which nominalization is a productive process.

6.2. The Halliday and Martin model

Halliday and Martin use the following passage from Newton’s Opticks to illustrate the practice of nominalization in early scientific texts:

> If the Humours of the Eye by old Age decay, so as by shrinking to make the *Cornea* and Coat of the *Crystalline Humour* grow flatter than before, the light will not be refracted enough, and for want of a sufficient *Refraction* will not converge to the bottom, of the Eye but to some place beyond it, and by consequence paint in the bottom of the Eye a *confused* Picture, and according to the *Indistinctness* of this Picture the Object will appear confused. This is the reason of the decay in the sight of old Men. And shews why their Sight is mended by Spectacles. For those *Convex* glasses supply the *defect of Plumpness* in the Eye, and by increasing the *Refraction* make the Rays converge sooner, so as to convene distinctly at the bottom of the Eye if the glass have a due degree of *convexity*. And the contrary happens in short-sighted Men whose Eyes are too *plump*. (Newton *Treatise on Opticks* 1704)
In the following pairs, some verb or adjective in the first expression (underlined) has been reworded in the second as a noun (bolded):

will not be refracted enough ... for want of a sufficient Refraction
paint ... a confused picture ... according to the Indistinctness of this Picture
make the Cornea ... grow flatter ... supply the defect of Plumpness in the Eye
those Convex glasses ... if the Glass have a due degree of convexity
(Halliday and Martin 1993:7)

These nominalizations enable a chunk of discourse that was previously presented as new information to be re-used as a given in the course of the succeeding argument.\textsuperscript{12}
The authors remark: “Creating a technical term is in itself a grammatical process; and when the argument is constructed by grammar in this way, the words that are turned into nouns tend thereby to become technicalized” (1993:7-8). This statement is perhaps too strong, in that there must be subsequent processes that are instrumental for an item to become “technicalized” i.e. its use by other writers contributes to its becoming a technical term, but the above formulation may well point to the beginning of such a process of technicalization. Elsewhere, Halliday uses another passage from Newton’s Opticks to deepen this analysis:

I found moreover, that when Light goes out of Air through several contiguous refracting Mediums as through Water and Glass, and thence goes out again into Air, whether the refracting Superficies be parallel or inclin’d to one another, that Light as often by contrary Refractions ‘tis so corrected, that it emerges in Lines parallel to those in which it was incident, continues ever after to be white. But if the emergent Rays be inclined to the incident, the Whiteness of the emerging Light will by degrees in passing on from the Place of Emergence, become tinged in its Edges with Colours. This I try’d by refracting Light with Prisms of Glass placed within a Prismatick Vessel of Water. Now those Colours argue a diverging and separation of the heterogenous Rays from one another by means of their unequal Refractions, as in what follows will more fully appear. And, on the contrary, the permanent whiteness argues, that in like Incidences of the Rays there is no such separation of the emerging Rays, and by consequence of no inequality of their

\textsuperscript{12} In Halliday and Martin’s demonstration this applies to deadjectival as well as deverbal nominalizations (in -\textit{ion} and -\textit{ing} gerunds). This analysis can therefore be extended to deadjectival nominalizations which I will examine in chapter 5.
whole Refractions. Whence I seem to gather the two following Theorems … (Newton’s Treatise on Opticks, 1704)

Of interest to Halliday in this passage are the nouns emergence, whiteness and inequality. These are not “technical” words, he notes, but the names of processes or attributes, “agnate to emerge, white, unequal” (1993: 60). Halliday questions why Newton writes “Now those Colours argue a diverging and separation of the heterogenous Rays from one another by means of their unequal Refractions …” rather than “those Colours argue that the heterogenous Rays diverge and separate from one another”, which is, after all, not a longer version. Halliday suggests that Newton is using nominalization to achieve two important discourse effects:

1) the packaging of a complex phenomenon into a single semiotic entity, by making it one element of a clause structure, so that
2) its rhetorical function – its place in the unfolding argument - is rendered fully explicit. (Halliday 1993:60)

There are two possible rhetorical functions. One is the presentation of previously given information. In this situation, the nominalization (the Theme) occupies the first position in the clause. The other is the presentation of new information, or foregrounding. In this situation the nominalization will appear in the unmarked position at the end of the clause. “Thus the device of nominalizing”, Halliday claims, “far from being an arbitrary or ritualistic feature, is an essential resource for constructing scientific discourse. We see it emerging in the language of this period, when the foundations of an effective register for codifying, transmitting and extending the ‘new learning’ are rapidly being laid down” (1993:61). This

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13 Halliday does not consider whether this might be choice between a that noun clause and two lexical nominalizations. Viewed this way, Newton’s textual manoeuvre is significant in that that noun clauses are common throughout the excerpt.
conclusion ties in well with the corpus data which suggest that action nominalization in \(-(t)ion\) is boosted in the seventeenth century. I will use an excerpt from a scientific text (Huygens and Papin) from the 1650-1700 period of ARCHER, to illustrate the processes described by Halliday.

1675 Huygens, Cristiaan and M. Papin. Some Experiments made in the Air Pump upon Plants, *Philosophical Transactions* 10, p120

This Experiment drew another after it, to know, whether the water purged of Air were less fit than common water to make plants *vegetate*. For this end I took two Vials full, the one of water purged, the other of common water, and having put a twigg of Baulme in each, I left them both in the Air. I found, that the twigg in the common waterer <sic> shot at the end of six daies, and in water purged shot this time neither but ten daies after it had been put in.

I repeated this Experiment once more, and I was much surprized to see, that the twigg in the water freed of Air begun this time to shoot the third day, and the other in the common water, still the sixth day. But this was remarkable herein, that the twigg in the water purged shot not more but one root which grew very long, and on the ninth day only it began a little to shoot another, which lengthen'd but one line in two daies, whereas the twigg in the common water had then nine or ten roots, which were all very long, having alwaies lengthen'd five lines or more in a day.

Although this Experiment appeared at first contrary to the precedent, yet it still confirmed the first thought, to wit, that the Air which is mixed in common water serves for *vegetation*, considering the little root which the twigg shot in the water cleansed of Air. Meantime I do not believe, it will be easie to know the particular reason, which made the first root shoot so soon.

The items I have highlighted are the verb *vegetate* in line 3 and its nominalization *vegetation* in line 20. *Vegetation* here is a transparent derivation and appears with the original meaning of “growth”, as an action or process, and not with the modern lexicalized meaning, “plant matter”.

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14 The first citation of *vegetation* in the OED is 1564. The selection of *vegetate* rather than *grow* relates to the earlier discussion of Latinate vocabulary: an everyday process receives a different appellation when under scientific investigation.
The verb *vegetate* is set out in the beginning in the experimental question. The experimental question is followed by the narrative of the experiment, and then the nominalization occurs in the summing up and discussion of the experiment’s results (notably without its subject, *plants*) referring to a previously described process. Evidently these cohesion relations can occur over lengthier stretches of texts than the examples that we have looked at would lead us to believe, but on the whole, this example (and there are many similar to it) confirms Halliday’s theory regarding the function of nominalizations.

Accounts such as Halliday’s of the role of derivation in discourse are rare, and even this one is fairly limited in scope. This has much to do with the way that derivation is traditionally treated acontextually in word-formation or morphological theory.\(^{15}\) Kastovsky and Kryk-Kastovsky (1997) should be mentioned (cf. Kastovsky 1982, 1986). Taking their cue from Halliday and Hasan (1976), they explore the concept of cohesion in discourse, which occurs where “the interpretation of some element in the discourse is dependent on that of another. The one presupposes the other …” (Halliday and Hasan 1976:3-4, Kastovsky and Kryk-Kastovsky’s emphasis). Kastovsky and Kryk-Kastovsky are particularly interested in lexical cohesion, of which they regard word-formation as a subtype, as it involves the partial recurrence of lexical material. Despite word-formation being a relatively frequently used cohesive device, Kastovsky and Kryk-Kastovsky note that: “as far we know, no large-scale systematic investigation of this function of word-

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\(^{15}\) Although see Hopper and Thompson (1980) on how nominalizations, by their nature, are discourse dependent and backgrounded; they also suggest that nominalization enables events to be treated as concrete rather than abstract, as human cognition is better able to deal with concrete entities. Merlan (1976) and Mithun (1984) discuss noun incorporation in discourse. Fincke (1997) examines the discourse motivations for verbalization in Bikol. Productive verbalization can present new and contrastive information because the stem of the verb is morphosyntactically rich (i.e. a non-verb) and not predictable from the other sentence constituents, for example: *dai mo pig-ki-Kimbies ‘You don’t (put her in) Kimbies (nappies/diapers)?* Lit. “You don’t Kimbies (her)?"
formation has been attempted either for a single language or, what would be even more interesting, contrastively” (1997: 463). I reproduce one of Kastovsky and Kryk-Kastovsky’s examples, which involves a deverbal nominalization:

“Once they hear Settlers are involved, that will only make it worse.” – Our involvement!” Tonya Walton exclaimed. “We had nothing to do with the attack” (Isaac Asimov and Roger MacBride Allan 1993, Caliban, in Kastovsky and Kryk-Kastovsky 1997:464).

Other examples of word-formation processes used for cohesion include: gerunds (killing) agentive compounds (order-giver, history-changer), reversatives (unlose). In the following example from Lipka (1972), the verb-particle combination is used anaphorically as what Kastovsky and Kryk-Kastovsky refer to as a sentence-proform:

... whelping occurs just as spring thaws begin to break up the winter ice in the Gulf of St Lawrence. Taking advantage of the break-up, pregnant cows among the 800 000 harps make their way south. (Time 21/3/69:30 in Lipka 1972)

In the same way, when action nominals are chosen from a range of competing expressions, it is frequently for their “text-compressing” function (Koptjevskaja-Tamm 1993:266). Because this function is dependent on communication needs, nominalizations are unevenly distributed among different styles of speech. More specifically, notes Koptjevskaja-Tamm: “the complexity of scientific discourse, reflecting the complexity of interrelated factors in scientific thought, favours nominalizations and other means of maximizing the amount of information in texts of comparable length” (1993:266).

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16 Koptjevskaja-Tamm also refers to an opposing function of “text elaboration”, but this appears to refer only to constructions consisting of an “empty” verb and a verbal noun, for example, to do damage (1993:269).
Another important observation made by Koptjevskaja-Tamm regarding the function of action nominals is the possibility of argument reduction that they represent. Action nominals allow subjects and objects to be deleted in situations where these are generic or indefinite (1993:270). I will conclude this section with a set of research questions posed by Kastovsky and Kryk-Kastovsky with regard to word-formation as lexical cohesion. Those relevant to this discussion are:

1. What is the quantitative distribution of these processes?
2. Is there a relationship between text type and the quantitative distribution of these processes?
3. What kind of referential relationship holds between the “referring item” and the “target item”?
4. What are the syntactic positions of the two cohesive items?
5. What is the directionality of the referring item and the target?
6. What are the factors that determine the force of the cohesive relationship?
(Kastovsky and Kryk-Kastovsky 1997:466)

I have attempted to answer questions 1 and 2 in this chapter on action nominalization in -(t)ion. For 2, it is worth noting that Kastovsky and Kryk-Kastovsky claim that word-formation as a cohesive device is used much less frequently in novels than in newspaper articles. Questions 3 and 4 have arisen in the discussion of Halliday (1993) above. Questions 5 and 6 are two further questions that must be investigated through textual analysis. Kastovsky and Kryk-Kastovsky find that anaphoric cohesion (the target is in the rhematic position, preceding the referring item) is more common than cataphoric. Some examples of the latter can be found in newspaper headlines. Kastovsky and Kryk-Kastovsky also find that nominal forms are more likely to function as referring items, and verbs and adjectives are more likely to function as target items (1997:468).
7. Textual analysis of nominalizations in \-(t)ion\ in ARCHER

The first part of this section extends and develops Halliday and Martin’s analysis of nominalization in scientific discourse. I compare two scientific texts from the seventeenth century. I then examine a nineteenth century medical text and a twentieth century medical text, observing the continuity of nominalizing practices in this register. In the second part, I examine new types produced by other registers, in order to contrast the conditions of this production of those nominalizations.

7.1. \-(t)ion\ in scientific and medical writing

The text below, “Anonymous”, is of interest for its high type frequency compared to the other texts for this cell: 18 nominalizations in \-tion\ per 1000 words (22 types in 992 words.) Huygens and Papin, from the same cell, has only 2 types (one of which was vegetation) in 1866 words, a type frequency of 1.1 per 1000 words.

1675 Anonymous. Some Observations and Experiments about Vitriol. Philosophical Transactions 9, p103

Vitriol is by the Spagyrical Tribe reputed one of the chief Pillars of Medicine and Alchimy; and is indeed endowed with many excellent and truly admirable properties; being employed by nature in her most Curious Mineral operations. Tis it self one of the most noble and useful productions, and therefore deserves our especial Consideration. I do not pretend to render a Mechanical account of its generation, or a history of all that may be performed by its mediation in Medicine or Chymistry; my design is only to furnish Inquisitive persons with some Observations and Experiments, which will probably enable them more easily to investigate the Nature of this Protean substance, as also afford some further light unto them in their Inquiry after the Principles and Properties of other Minerals. Vitriol is of several kinds, being, for colour, White, Yellow, Green, or Blew; usually, of the two last mentioned. And is made either of Mineral Waters, boyled up to a convenient consistence; then set to Chrystallize: Or extracted by Common Water out of Earths impregnated therewith. Tis also afforded by many sorts of Stones, commonly called Pyrites and marcasites, which exposed some Months unto Aerial influences, are resolved into powder, and the Saline part dissolved in Rain or other Water; then
boyled and set to shoot, yields store of Vitriol, especially with
the addition of Copper or Iron. It is often associated with Earth
and Stone, wherein Metals are contained; and with many natural
recrements of metals, such as Misy, Sory, Chalciitis; from which
'tis usually separable by the common method with Water, sometimes
not to be extricated until the Mineral be first calcined or burnt.
It is also frequently found pure and perfect in the Caverns of the
Earth being an Efflorescence of several Minerals; and this is
accounted by all Naturalists the best, both for medicinal and
Spagyrical uses. Last, it is copiously contained in common Mineral
Sulphur, as I shall anon fully evince. Vitriol usually accompanying
most Metals and Minerals, many do apprehend, it is alwaies one of
their component principles, at least, a necessary Cause of, or
Agent in, their Production; which if meant of the Acidity or Saline
part of Vitriol, seems highly probable; as I shall manifest at
large in the ensuing discourse. But first I think it expedient to
examine, what are the constituent parts of Vitriol, whereby we
shall be better enabled to judge of its nature and properties.

Vitriol consists of Inipid phlegme, Earth or Oker, some
Mettal, Mineral Sulphur, an acid Salt or Spirit, together with some
small portion of the Volatil Aerial Salt.

That it contains Water, needs no great proof, since no Saline
substance can crystallize without it; and distillation will
convince any person, that it exceeds in quantity any of the other
Principles.

The Earth or Oker may be thus separated: Dissolve Vitriol in
fair water, immediately a yellow powder will separate, and in a
short time subside: The greater the quantity of water imposed, the
more Oker precipitates: The weaker the lixivium, the less able to
support Bodies more ponderous than common water: And the lighter
the Water (as if distilled rain-water, or phlegme of vinous
Spirits,) the more Earthy parts subside, upon the same
Hydrostatical principle I just now mentioned. I have above twenty
times repeated this dissolution, seconded by filtration and
coagulation, and each time separated some quantity of this Earth;
and am Perswaded, had I long continued the operation, the success
would have been the same; only I observed the quantity separated
each time sensibly to diminish: And Basilius Valentinus assures,
that at length the Vitriol will let fall no more sediment; and that
then it is the subject of most noble operations by him
particularized; which they who have leisure, and confidence in his
specious promises, may do well to try. I have found a more easie
and expedite way of effecting this separation, which may be of
great use to them who work on Vitriol, much abbreviate their
labour, and considerably lessen their expence.

Take a good quantity of the common, Dantzick, or Hungarian,
Vitriol; having powdered it, put it into a slender Cucurbite, place
it in Water, keep under it an equal constant fire three or four
days: The Vitriol without additament will become fluid, as if
dissolved in water, and the Oker with most of the Metalline parts,
with the gross Sulphur, will subside, and become a hard Cake at the
bottom, the Vitriol being fluid above it, which in the cold again
Crystallizeth; excepting a final quantity of liquorament of the same
nature with that we shall hereafter mention: This repeated once or
twice, the Vitriol attains unto a high degree of purity, and is
easily capable of many alterations, whereunto it was not subject

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before this purification. This operation will not succeed in a dry
digestion: I mean, Ashes, Sand, Filings of Iron, Steel, open Fire,
or even flame of Lamps, whether fed with Oil or Spirit of Wine.
This Earth may also be obtained in a great proportion, though in
another form, if after a long and intense Calcination the Vitriol
is freed from its remaining Salt by frequent ablutions with warm
Water: The far greatest part of this dulcified Colcothar is insipid
Earth with some small proportion of Mettal. The Same may be
precipitated by Salt of Tartar, or any other Alcalies, or filings
of Zink, or other immature Minerals, out of a solution of Vitriol
in Common water: It being also separated from Metalline and Saline
parts, by a method I shall hereafter mention, there remains a great
quantity of an insipid substance nearly resembling burnt Allom:
Besides, whereas Salt, Nitre, &c. require in distillation a larg
quantity of Earthy substance to disjoin the Saline parts, and
prevent fusion; Vitriol and Allom need it not; and unquestionable
proof, that Earthy parts abound therein.

A predilection for action nominalizations emerges from the first paragraph, with its
sequence of operations, productions, consideration, mediation and generation (lines 4-8).

All of these come in the last position in the clause, and do not have a base form in the
text, yet their function is not to introduce new information. Apart from creating an
internal rhyme, their role in the introductory paragraph is to sum up that which is already
known about the substance Vitriol, and why is it important, in other words, why this
article deserves the reader’s attention.

In line 25 two methods of obtaining vitriol from a mineral are identified:
separating the Vitriol using water, or burning the mineral. The separation process is
described from line 26, the first stage of which is a dissolution. The stages of the
separation (dissolution, filtration and coagulation) are listed in line 54. All arguments of
the underlying verbs in those nominalizations are suppressed. The formulation allows for
the economic statement of lengthy process with several stages. The listing of action
nominalizations in this way serves (on most occasions) a text-compressing function, part
of which is argument reduction. Of these three, only dissolution has a base in the passage
(dissolve). The author assumes prior knowledge of the processes of filtration and
coagulation i.e. the information is given at some earlier stage. I am primarily concerned with cases in which both the referring item and the target item appear in the text, as this is the typical pattern of a new nominalization, but the kind of assumptions made by the author here are revealing as to how existing nominalizations are deployed, which I have suggested is part of an item becoming technicalized.

The separation process is referred to as the operation in line 56 and the nominalization separation is actually used for the first time only in line 63, referring back to the verb in line 46. The alternative process, in which the mineral is “burnt or calcined”, is presented as calcination in line 81. Potentially the only nominalization in the passage which introduces new information is digestion in line 78, occurring in the last position in the clause. It is followed by a colon, and a list of items that might qualify as a “dry digestion”. However, the meaning of digestion here may be quite concrete, and once an item has lost its transparency its cohesive powers are lost. Finally let me point out the interesting relationship between fusion in line 91, and the verb disjoin. It is necessary to disjoin the saline parts, an action which is prolonged by preventing fusion. The pair show the same antonymic relation between the bases as Newton’s nominalization of grow flatter by defect of plumpness.

It is interesting that a passage so rich in action nominalizations has few noun clauses, a wh-clause in line 37 and that noun clauses in lines 43, 59 and 94. Wh-clauses are identified by Biber and Finegan as characteristic of involved production, but that noun clauses are not featured in their studies of ARCHER. We find participial phrases and a dominant use of passive voice in this passage, features of informational production and elaborated reference.
The next text, "A.I.", is more restrained in its use of action nominalization.

There are 8 types in 759 words, yielding a type frequency of 10.5, which, although not low compared to, for instance, Huygens and Papin, is low compared to Anonymous' 18. In any case, the type frequency does not provide a true indication of the productivity of action nominalization in this passage.

1675 A.I. A Conjecture concerning the Bladders of Air that are found in Fishes. *Philosophical Transactions* 10, p114.

Reflecting on that Question, Whether Liquids gravitate upon Bodies immersed or not? I came to a Resolution in my own thoughts, that they do gravitate; and one of the greatest instances that did occur to me was, that a bubble of Air, rising from the bottom, does dilate it self all the way to the top; which is caused by the lessening of the weight or pressure of the incumbent water, the nearer it is to the top. Upon consideration of that instance, the following conjecture presented it self to my thoughts; That fishes by reason of the bladder of Air that is within them can sustain or keep themselves in any depth of water. For the Air in that bladder is like the bubble, more or less compressed, according to the depth the fish swims at, and takes up more or less space; and consequently the body of the fish, part of whose bulk this bladder is, is greater or less according to the several depths, and yet retains the same weight. The Rule <de infidentibus humidio>, is, that a Body that is heavier than so much water as is equal in quantity to the bulk of it, will sink; a Body that is light, will swim; a Body of equal weight, will rest in any part of the water.

Now by this Rule, if the fish in the middle Region of the water be of equal weight to the water that is commensurate to the bulk of it, the fish will rest here without any tendency upwards or downwards: And if the fish be deeper in the water, the bulk of the fish becoming less by the compression of the bladder, and yet retaining the same weight, it will sink and rest at the bottom: And on the other side, if the fish be higher than that middle Region, the Air dilating its self, and the bulk of the fish consequently increasing, but not the weight, the fish will rise upwards, and rest at the top of the water …

So far this Conjecture: In reference to which, when it was propounded to the Honourable Robert Boyle, he, reflecting upon the manner how a Fish comes to rise or sink in water, soon bethought himself of an Experiment probably to determine, Whether a Fish makes those motions by constricting or expanding himself? The Experiment by him suggested was; To take a Bolthead with a wide neck, and having fill'd it almost full with water, to put into it some live fish of a convenient size, that is, the biggest that can be got in, as a Roch, Perch, or the like; and then to draw out the neck of the Bolthead as slender as you can; and to fill that also almost with water: Whereupon the fish lying at a certain depth in
the water of the Glass, if upon his sinking you perceive the water at the slender top does subside, you may infer, he contracts himself, and if, upon his rising, the water be also raised, you may conclude, he dilates himself.

*Compression* is the only nominalization for which there is a base in the text (line 12). The nominalization (line 23) appears in the last position in the clause, allowing for an economic restatement of the process as the object of the preposition *by*. Note that the nominalization maintains its argument, *the bladder*, the patient of the verb *compress*. I have underlined other verbs in this passage that are likely candidates for nominalization, yet they are not nominalized, despite appearing in the passage several times in various guises, for instance *dilate*, which appears as a non-finite verb (line 5), a present participle (line 26) and finite verb (line 42). The same is true of *gravitate*, *constrict*, and *expand*. These last two verbs appear as gerunds however, in line 33, also as objects of the preposition *by*. This choice of the gerundive over action nominalization may have to do with the anthropomorphism of the fish. In the gerundive construction, the reflexive *himself* can still appear as the object. Third person pronouns are associated by Biber and Finegan with narrative discourse. Other features of this passage are: relative pronouns, and participial clauses, wh-noun clauses, *that* noun clauses, and appositives. But I counted only five passive verbs in the whole excerpt, and what further differentiates this passage from A.I., is the causal co-ordination, extensive use of modal adverbs such as *perhaps* (not shown above) and, in the last paragraph, *to* infinitives (a feature of persuasion or argumentation), and second person pronouns (a feature of involved production).

This comparison of Anonymous and A.I. gives us some sense of how texts which which exploit nominalization as a cohesive device can differ, and also some idea of the
nature of the texts which are likely to exploit it more. My next text, “Sinclair” is from the medical register of the 1850-1900 period of ARCHER.


Case IV. <Accidental Haemorrhage; Death> -- On May 17th, 1866, Mrs. ---, aet. 40, eight months advanced in her ninth pregnancy, while about her domestic duties, was seized with a moderate flow of blood from the vagina, preceded by a sensation as if something had snapped within her. The haemorrhage soon increased, and she sent for her physician, who found her much exhausted, with a cold skin, clammy perspiration, and feeble, rapid pulse. He administered restoratives, and after a while she rallied and became tolerably comfortable. He ruptured the membranes and gave ergot, but failed to check the flow entirely. The case was fast becoming so critical that there remained but one means to give the slightest chance of life to the mother, and that was to deliver by turning, the cervix being too undeveloped and rigid to use forceps. At this stage, I was asked to assist. I found her with a pulse of 120, small and feeble, great physical depression, and blood oozing from the vagina. The foetal head presented. I concurred with the attending physician that death threatened, and that it might be advisable not to allow her to die undelivered. After etherization, the hand was passed into the uterus with considerable resistance. Version was easily accomplished, but the extraction of the foetus was effected with unusual difficulty. An enormous quantity of clots was removed with the placenta from the cavity of the uterus. Uterine contractions did not come on for some time after delivery, although the uterus was stimulated by the presence of one hand internally and the other manipulating the abdomen. Ergot was also repeated. She came out of the ether quietly, and took stimulants freely; but she was extremely exhausted, and died in about thirty minutes after delivery.

Etherization in line 19 occurs in the first position of the clause, a referring item, which assumes previously given information. The nominalization appears without any of the arguments of the verb - it is impossible to determine whether these involve the physician as active subject, or the patient as passive subject.17 We have seen several nominalizations of which the arguments have been suppressed, but up to this point I have

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17 The OED identifies etherization as an English derivation (from 1851) meaning “the administration of ether as an anaesthetic or narcotic” or “the process of becoming, or condition of being, etherized”.
suggested that this is primarily for reasons of economy. In scientific discourse there are further motives of impersonality when the argument is the scientist as agent.\textsuperscript{18}

The nominalizations in this passage occur at an interesting moment. Up to line 14, the passage consists of a narrative of events that take place before the speaker arrives on the scene. Lines 14-19 are also narrated events, which take place after the arrival of the speaker. Verbs in this section are mostly active, past tense, until line 19, although there are some interesting constructions, such as the use of \textit{present} intransitively, as in “the foetal head presented”. Then, from line 19, there is a sequence of action nominalizations, beginning with \textit{etherization}, followed by \textit{version} and \textit{extraction}, in two subsequent clauses (both are in the first position of the matrix clause). The only argument is “the foetus”, for \textit{extraction} but these nominalizations militate against the use of personal pronouns unlike the earlier text, and whereas the passive voice has been in limited use up to this point, at least for clinical action, we now get “the uterus was stimulated” and “ergot was also repeated”. In line 27 the personal pronouns return as well as the active voice. The nominalizations here have a distancing effect, along with other devices, such as the articles \textit{one} and \textit{the} with \textit{hand}. It is tempting to conclude that the discourse shifts in this way in order for \textit{a physician} to distance himself from what others experience as a human trauma, but as Don Chapman\textsuperscript{19} points out this may simply be an attempt to make the discourse generic. However, the two explanations may not be mutually exclusive.

\textsuperscript{18} Argument suppression in nominalization in scientific discourse can be motivated by the same factors as the suppression of agency in passive constructions described in Atkinson (1996). Nominalization is also one of a set of grammatical features “which tend to be significant for expressing power relations and for expressing what is taken for granted” (Fairclough in Stubbs 1996:97) I have not discussed cases where agency has been deliberately suppressed through nominalization in order to avoid accountability for actions.

\textsuperscript{19} Personal communication.
This passage also demonstrates the ways in which a medical text can switch between typical narrative discourse and more specialised patterns.

Finally, let me point out the rephrasing of *turning* (line 13) as *version*, which, according to the OED, has an obstetric meaning from 1853 (although the variation with turning in this passage suggests that the term may not have been universally adopted). The other nominalizations in -(t)ion seem to have brought forth the Latinate term.

*Contractions* in line 24 should be considered lexicalized, given the use of the qualifying adjective *uterine*. The last learned text I will examine, “Bockman”, is from the medical register of the 1950-1990 period of ARCHER. I reproduce a small section below.


Case 3  A 19 year-old white woman had focal and generalized seizures that were poorly controlled by drugs. Persistent generalized seizures and *obtundation* necessitated multiple *hospitalizations*. Electroencephalography showed generalized right-sided spike-wave discharges Five months after her initial seizure, the patient died of severe bronchopneumonia. Her rapid demise suggested the possibility of a degenerative process like that of Creutzfeldt-Jakob disease.

The nominalization in line 3, *obtundation*, appears as a new type for the corpus, and does not appear in the OED. The OED does have an entry for *obtund*, a verb base which is a seventeenth century borrowing from Latin *obtundare* “to beat against, blunt, dull” (1400, 1471) but also to “deafen” (1694) or, “deadening, weakening” (1645). *Obtundation* forms part of a compounded subject with “generalized seizures”. The nominalization of *obtund* thus allows for an injury or event to be read as a symptom which can be listed with other symptoms. The same clause has an action nominalization as its object, namely *hospitalizations*, which takes no argument such as “of the patient”. In the next section, I
will briefly illustrate the textual environments of new types in other registers, by way of contrast to the cases above.

7.2. Other registers

The first two examples both occur in texts from fiction (Elkin and Fraser) for the 1950-1990 period of ARCHER.


Dick's guests that night were Dr. Jack Patterson, Associate Professor of English at Hartford Community College; Bernard Perk, a pharmacist, probably the ablest proponent of *fluoridation* in all New England; Pepper Steep of the Pepper Steep Charm School; and rounding out the panel, Mel Son, the Amherst disc jockey whose experiences with the powerful Democratic machine when he'd tried to run for state office had once earned him Special Guest status.

1977. Fraser, Antonia. *Quiet As a Nun*

Even in the convent Rosa had still needed strength. 'There wouldn't have been that ghastly upset,' Beatrice went on, 'that nervous breakdown -- that's what it was of course, but the nuns would never admit it. Even her terrible plan to shut herself up in the tower. That would never have happened if they hadn't sent me away, using the excuse of a particular friendship. It was deliberate *victimisation.*' Another phrase from the modern world. 'Mother Ancilla told me Rosa had been very ill,' I put in mildly. 'Oh she told you that. Too late. And wrapped you round her little finger, I'll be bound. The charm of that woman when she wants to use it. But she didn't fool little Ronnie, my sister Veronica, she knew the truth about Mother Ancilla.' Beatrice O'Dowd's tone changed abruptly. 'There was another will, you know.'

*Fluoridation* (Elkin, line 3), the practice adding fluoride to drinking water, is first cited in 1949 in the OED. The term is an extraneous detail to this narrative, the concept is not central to the story. It is not being used to build knowledge, or even list an action or process that is a part of the events related. This is frequently the case with nominalizations in fiction, and for that reason, those that occur in the fiction register of a
corpus are seldom new according to a dictionary. *Victimisation* (Fraser, line 7) is used quite self-consciously. It is followed by the comment “another phrase from the modern world”, even though the earliest citation is 1840. This creates the impression that the item may have been coined in a learned register and filtered into popular use, frequently the case with action nominalizations which occur in popular registers.

*Strangulation*, which appears as a new type in news 1750-1800 (although cited in 1542 in the OED) occurs in a passage that sounds very much like a contemporary medical text. The article, shown below, is directed towards persuading its readers to take themselves to a reputed surgeon should they be suffering from a particular problem, displays a wealth of medical detail and terminology:

1773. New York Journal or General Advertiser. 1/7/1773, #1566, p. 3.

HUNTINGTON, November 28.

This Day, a Man died in this Town, of a Rupture, of many Years standing, which he had too much neglected, contenting himself with only now and then putting it up. It was what Surgeons call a complete Enteroccele: The intestines descending in a large Volume quite to the Bottom of the Scrotum. On Thursday the 26th about 9 o’Clock, A. M. while at Work, he found himself in great Pain, succeeded by violent Reachings, Hiccoughs, &c. the usual Symptoms of a *Strangulation*. After many fruitless Endeavours to relieve himself, he sent for a Surgeon, who about <???> o’Clock, P. M. found the Part enormously large and tense, and for one Quarter of an Hour attempted to reduce the Rupture, but without Success, as might reasonably be expected. …

Yesterday the Part affected became edematous; in the Evening emphysematous, with a small quick Pulse; cold Sweats, and a large black mortified Spot, as big as a Dollar, on the Bottom of the Scrotum;—and this Morning he died. This Information (tho’ a Month later than was intended) is given, not so much for a Piece of medical News to Gentlemen of the Faculty, as for a Warning to Patients who unfortunately have Ruptures or Bursts, as they are vulgarly called.
7.3. -(t)ion as a stylistic convention

The last text is a personal letter from William Blake to his brother in 1803:

To James Blake 30 January 1803
Felpham,

Dear Brother,
Your letter mentioning Mr Butts’ account of my
Ague surprized me because I have no Ague, but have had
a Cold this Winter. You know that it is my way to make
the best of everything. I never make myself nor my
friends uneasy if I can help it. … Pray remember
us both to Mr Hall when you see him.
I write in great haste & with a head full of botheration
about various projected works & particularly a work
now Proposed to the Public at the End of Cowper's Life,
which will very likely be of great consequence; it is
Cowper's Milton, the same that Fuseli's Milton …
These are works to be boasted of, & therefore
I cannot feel depress’d, tho’ I know that as far as Designing
& Poetry are concern’d I am Envied in many
Quarters, but I will cram the dogs, for I know that the
Public are my friends & love my works & will embrace
them whenever they see them. My only Difficulty is to
produce fast enough …
my wife joins me in Love to you both.
I am, Sincerely yours,
W. Blake

Botheration (line 8) is described by Marchand as a “mock-learned” formation
(1969:261), and appears in the OED from 1797, defined as an “act of bothering”
or “petty vexation or annoyance”. The formation is clearly rule-governed, and the
reasons for its lack of seriousness have to do with intention and context.

Botheration, judging by Marchand’s remarks, can be classified as playful word-
formation, rather than word-formation as naming a new concept or material
object. It does not perform any of the functions of action nominalization described
in section 7.1. either.

I have argued that action nominalization is not a productive process in oral
registers such as letters, journals, drama, and fiction. However, these registers are
the likeliest to produce playful word-formations like *botheration*. Rather than a
dichotomy between word-formation as naming and word-formation as play, we
can posit a range of motivations. Some involve the kind of functions we have
looked at in 7.1, but beyond that, word-formation can become a stylistic
convention, or a marker of register.

The learned associations developed by -(t)ion are variously alluded to, for
instance by satirists such as Shadwell, whose 1676 play, *The Virtuoso*, contains
the following lines, uttered by Sir Nicholas Gimcrack, representing the scientist
Robert Hooke:

> It comes first to fluidity, then to orbiculation, then fixation, so to angulization, then
crystallization, from thence to germination or ebullition, then vegetation, then
plantamination, perfect animation, sensation, local motion, and the like. (Shadwell, *The
Virtuoso*, 1676)

This passage is supposed to be a parody of a description in Hooke’s *Micrographia* (1665)
of how a plum turns blue. The original version of the *Observation of Blue Mold* hardly
differs, and we find the same hyperbolic listing of action nominalizations:

> Nor do I imagine that the skips from one to the another will be found very great, if
beginning from fluidity, or body without any form, we descend gradually till we arrive at
the highest form of a brute Animal’s Soul, making the steps or foundations of our
Enquiry Fluidity, Orbiculation, Fixation, Angulization or Crystallization, Germination or
Ebullition, Vegetation, Plantamination, Animation, Sensation, Imagination ... (Hooke,
*Micrographia, Observation of Blue Mold* 1665)

Hooke seems to describing various stages in a natural order, which suggests that these
processes, really states here, have more than just a practical descriptive significance.
Marchand offers further evidence of “ridiculing criticism of the growing use of the
learned suffix” in the form of this seventeenth century quote from the OED entry on
-(t)ion: “But what languages do they speak, servant? Several languages, as Cawation,
Chirpation, Hootation, Whistleation, Crowation, Cackleation, Shriekation, Hissation.”

This kind of evidence suggests that –tion was a conspicuous marker of the learned registers by the seventeenth century. Beyond the seventeenth century, Marchand lists further examples of “mock-learned” coinages in –(t)ion which he describes as “colloquial, jocular or vulgar”: darnation, flinderation, flusteration, fudgetation, furiation, murderation, quiration, splatteration, thunderation, twistification, twitteration and worryation (1969:261).

But a learned register is not always feigned for humorous purposes. Halliday observes the more modern exploitation of the markers of the scientific register in bureaucratic discourse:

A newly evolving register is always functional in its context ... the language may become ritualized, but it cannot start that way, because to become ritualized, a feature must first acquire value, and it can acquire value only by being functional. Thus despite the extent to which scientific English comes to be ritualized, and carried over as a language of prestige and power into other contexts where its special features make no sense except as ritual (for example in bureaucratic discourse) (1993:68).

The same development, probably, that leads Nigel Spivey to proffer the advice in the epigraph to this chapter.

8. Implications: ephemeral neologisms versus technical terms

The analysis of nominalizations in their surrounding discourse is the practical realisation of the theoretical claims that were made in chapter 1: neologisms are created in context and are not agreed upon in an abstract speech community.

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20 Randolph, Amyntas (1638) in OED.
21 Certain nominalizations in this list, also have jocular verb bases for example twistification, but for most of them, it is the nominalization that has a jocular aspect.
These findings are highlighted if considered in relation to a distinction made by Baayen and Renouf:

our central concern in this study is the spontaneous, unintentional and ephemeral use of productive word-formation, not with conscious and deliberate lexical creativity in which a novel expression is carefully constructed to express a new concept intended for repeated use within an – often specialized – domain. The hapax legomena in our corpus tend to be the prototypical instantiations of ephemeral word-formation that is most similar to the productivity of syntactic constructions … Although a neologism can be created to fill a lexical gap (as when a new technical term is introduced to describe a novel concept, in which case it is likely to be used more than once), this appears to be a rare phenomenon in our corpus. (Baayen and Renouf 1996: 78-79)

The “ephemeral” new words produced spontaneously are regarded as typical of highly productive processes, whereas the deliberately coined words tend to be associated with semi-productive processes. As the productivity of a pattern decreases, “the likelihood increases that speakers are aware of the fact that they are coining a new word”. They may even “exploit the salience of semi-productive neologisms for foregrounding purposes” (1996: 81). Furthermore, these two categories of neologising are characteristic of different registers. Technical terms are deliberately created in “specialised domains”.

Baayen and Renouf have made important assumptions about the motivations for neologising. They present only two kinds of motivation: the naming of a new concept/object on the one hand, and on the other, a productivity akin to syntactic productivity. This syntactic productivity is not incompatible with the functions we have observed for action nominalizations, yet we would hardly term these uses “ephemeral”.

Kastovksy and Kryk-Kastovsky place word-formation processes on a functional scale,

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22 Baayen and Renouf are more concerned with the ephemeral terms, yet their corpus consists of news reportage, a register more likely than “oral” registers to deliberately coin words for foregrounding purposes.
one pole of which is purely lexical. The output, lexical items, “provide a designation, a
name for a ‘nameworthy’ segment of extralinguistic reality” (1997:465). The “quasi-
pronominal” function shown by word-formation processes in cohesion, can be placed on
the other, syntactic pole.

Much depends on the function(s) of the individual word-formation process, if it is
even appropriate to consistently assign a process to the same point on such a scale. For
instance, one process studied by Baayen and Renouf is adverbial –ly, which is productive
to the extent that it is regarded as inflectional. To what extent can –ly be said to serve a
discourse function? If it does not, it might be correctly labelled “ephemeral”. Kastovčky
and Kryk-Kastovsky suggest that only nominalizations, verbalisations, adjectivalisations
and compounds are used for textual cohesion. The adverbial suffix is native rather
than Latinate, it is not learned, and therefore may occur more in oral registers. But these
claims require empirical verification.

Action nominalization is a highly productive process, but in English,
typically only in more specialised registers. Deciding whether its creations are
deliberate or conscious is problematic. In many cases a derivation that is not
coincd deliberately as a technical term will be taken up and used as such, and,
vice versa, a derivation deliberately coined as a technical term (which is seldom
possible to evaluate) might never catch on. This distinction cannot be made in a
study of productivity through types, as opposed to a study of the history of
individual types, two enterprises which should ideally complement each other.
5 Competition and Variation

1. Introduction

The procedures and analyses developed for action nominalization in -(t)ion in the previous chapter are duplicated here with respect to deadjectival nominalization in -ness and -ity. These two deadjectival nominalizing suffixes have been the subject of some attention because of the competitive relationship which is held to exist between them. The history of the suffixes and accounts of this competition are reviewed in section 2.

The concurrent treatment of two suffixes with the same morphosyntactic function (deadjectival nominalization) or the same “semantics” (QUALITY or ATTRIBUTE) means that the analysis of the productivity of these affixes takes on a dimension of competition, or, if the relationship can be so described, variation. As I have cautioned, the restriction of the productivity of an affix cannot be fully accounted for by reference to its morphological rival(s). In chapter 2 I criticised word-formation theories such as Aronoff (1976) which base a theory of productivity on competition between derivational morphemes. I argued that such an approach cannot claim to “explain” productivity, as it does not first consider the productivity of the category-changing process (in the case of -ness and -ity, deadjectival nominalization). A study of the rivalry of -ness and -ity such as Aronoff (1976) simply identifies structural factors which may determine the differential productivity of the rival affixes. I will therefore treat the productivity of deadjectival nominalization (subsuming -ness and -ity) in addition to comparing the productivity of the suffixes, and the extent to which they may affect each other’s productivity. The discussion of the pragmatic motivations for the use of these suffixes will refer to the discourse processes or contextual factors which promote their use first as
deadjectival nominalizing affixes, and then those which promote the use of -ness over -ity or vice versa.

Information about -ness and -ity is available from corpus surveys, for Middle English (Dalton-Puffer 1996) and for Modern English (Baayen and Renouf 1996). Studies based on dictionaries are concerned with Modern English (Aronoff 1976) or outline the behaviour of the suffixes over a long time span from Old English to Modern English (Anshen and Aronoff 1989, Aronoff and Anshen 1998, Riddle 1985). Romaine (1985) compares translations of a single text from Old English to Early Modern English, which, as a diachronic corpus study, fills necessary gaps, but the sample is very small. The present account of the occurrence of the suffixes in HCE and ARCHER thus fills a considerable gap in our knowledge of suffixes and the relationship between them.

On the basis of the evidence from the corpora, I consider whether the pair of suffixes can really be said to compete. If the answer is yes, or even if the answer is "sometimes", the model of sociolinguistic variation must be adjusted to cater for this case of variation and potentially all cases of variation in derivational morphology. On the other hand, the model may have to be so distorted that it could no longer be considered an approach to sociolinguistic variation. It appears that monomorphemic lexemes and other derivations which compete with derivations in -ness and -ity cannot be excluded from the account of variation.

Section 3 reviews the concept of the sociolinguistic variable, and whether it can theoretically be applied to derivational morphology. In section 4 measurements of the productivity of -ness and -ity over time based on HCE and ARCHER are presented. Section 5 assesses the evidence of competition and variation for the corpora, and suggests
that this should consist of more than the simple identification of doublets or minimal pairs in the suffixes. In section 6, I examine the effect of register on deadjectival nominalization, as well as the role played by register in the differential distribution of -ness and -ity. The findings of this investigation are complemented by analyses of texts (section 7) which appear to promote nominalizing in either one or both of the suffixes.

2. The story of -ness and -ity

Before analysing the distribution of -ness and -ity in ARCHER and HCE, I shall briefly summarise the findings of existing studies of the two suffixes. This should provide some insight as to why it is that the two suffixes have been regarded as morphological “rivals”, and allow us to formulate a hypothesis about their performance in the corpora. The primary observation made by Marchand (1969) and others is that -ness and -ity both form abstract substantives with the meaning “state, quality, condition of”. The native suffix, -ness, appears in derivations on native bases in Old English (brightness, darkness) and Middle English (acuteness, deadness, humanness). Derivations in -ness with borrowed French adjectival bases are, according to Marchand, common from 1300 (tenderness c1300, curiousness 1386). On the whole, the majority of the adjectival bases which occur with -ness are native, followed by “everyday” French words. -ness also forms derivatives from composite adjectives (wrongheadedness), participial adjectives (devotedness), and phrases such as matter-of-factness (c1800) (1969:334-336).

The earliest words in -ity in English are fourteenth and fifteenth century French loans (ability, captivity). These French words are “mots savants” and are formed on a Latin basis of coining. Some French loans contain the variant -te such as chastete (1225)
and curiousst which were “latinizingly refashioned” into chastity and curiosity in the sixteenth century (Marchand 1969:312-314). Many substantives and adjectives are separate loans, for example, superfluit (ME) and superfluous (ME). Sensuality (1340) is older than sensual (1450). If the English substantive in –ity is not a separate loan, Marchand claims, it is “a word coined as the actual or potential Latin substantive in -itas”. He identifies the following patterns of derivation:

(i) -ability: originally appeared in Latin word pairs such as implacable (1552) vs. implacability (1531). These gave rise to, among others, capability (1587), respectability (1785) and adaptability (c1800). Today –ability is restricted to deverbal adjectives with a passive meaning. Other adjectives in –able tend to take –ness e.g. charitableness and agreeableness, although some pairs are “equally common”, for example suitableness vs. suitability. The derivative in –ness is usually older.

(ii) -icity: the loan rusticity (1531) gave rise to formatives such as eccentricity (1551), electricity (1646), elasticity (1664), and historicity (c1900), all of which Marchand claims are earlier than their French counterparts.

(iii) –ality: loans such as bestiality (1374) gave rise to items such as virtuality (1483), rascality (1577), and technicality (c1800).

(iv) –arity: singularity (1340) gave rise to items such as peculiarity (1610) and similarity (1664).

Other coinings on a Latinate pattern mentioned by Marchand include inferiority (1559) and torpidity (1614). –ity does not therefore exclusively appear on the above bases.
There are almost no derivations on native bases except for *oddity* (1711), but –*ity* can occur with derived native adjectives in –*able*, for example, *believability* (1865) and *workability* (1874). The fact that –*ness* can occur with non-native bases means that “the suffixes often compete and we have sense or other variants such as *accurateness/accuracy, entireness/entirety, fatalness/fatality, inextricableness/inextricability, inflexibleness/inflexibility, oddness/oddiy, sincereness/sincerity, singularness/singularity*” (Marchand 1969:335). This kind of list is particularly suggestive to the historical linguist: if these pairs exist in Modern English, how much more historical evidence is there of this kind of variation?

Dalton-Puffer’s 1996 study quantifies the developments described by Marchand for Middle English. –*ness*, she observes, has been a high frequency item in English for a long time: the number of types in –*ness* in the Middle English part of the Helsinki Corpus reduces from ME1 (1150-1250) to ME2 (1250-1350) and then remains steady for ME3 (1350-1420). The number of types common to all periods is small, which, according to Dalton-Puffer, shows high productivity. In contrast, the number of types in –*ity* increases in Middle English, with 84% of the total types appearing in ME3. Of the 67 –*ity* types in ME3, 20 have a base which either does not occur as an independent word but as a stem in another formative, or which does not appear in any other formative. “On the whole,” Dalton-Puffer remarks, “a surprisingly high number of these items is perfectly transparent” (1996:107). In the entire Middle English section of the corpus, –*ity* forms only one hybrid type (Germanic base + Romance affix), 1.4% of the total types for –*ity*, and –*ness* forms 32 hybrid types (Romance base plus Germanic affix), 14.5% of the total types for –*ness*. 
Romaine (1985) explains that the “extension” in the productivity of \(-ness\) and the successful spread of the suffix is “partially accounted for by the fact that it managed to attach itself to native as well as native roots and was able to compete with certain French suffixes, especially \(-(i)ty\)” (1985:43). She cites the pairs \(delicacy/delicateness\) and \(frailty/frailness\) as an illustration of that competition. Romaine does not mention Latinate coinings, simply noting that \(-ity\) makes its appearance in fourteenth and fifteenth century loanwords from French, and later in loanwords from Latin. Romaine’s empirical study showed that the use of \(-ness\) decreased and the use of \(-ity\) increased across three different translations (Alfred, Chaucer and Elizabeth I) of Boethius’ \(De\ Consolatione\ Philosophiae\). Romaine has also compared two translations of the Polychronicon which fall between the dates of Chaucer and Elizabeth’s texts. Here the variation is considerable: Trevisa uses a total of 50 nouns ending in \(-ness\), compared to the unknown translator’s 13, and only 7 forms in \(-ity\) compared to the unknown translator’s 44 (1985:461).

For Early Modern English, \(-ness\) and \(-ity\) “have partly overlapping input ranges” (Nevalainen forthcoming 7.5.3.1.5). Some of Nevalainen’s examples of Early Modern English derivations in \(-ness\) include: \(disingenuousness, self-consciousness\) and \(wittiness\). According to Nevalainen, the suffix also “readily appears” with participles, as in \(invitiness, premeditatedness\), an interesting observation in the light of Dalton-Puffer’s recording of the decline of deverbal \(-ness\) (including present participle bases) in Middle English. The only derivations in \(-ity\) from this period described by Nevalainen are Latinate coinages on \(-ic, -al\), and \(-able/-ible\) adjectival bases.
-ness in modern English is regarded as fully productive (Romaine 1985, Aronoff 1976, Baayen and Renouf 1996). Romaine counts a total of 5902 words in -ness and -ity in Lehnert’s reverse dictionary (1971), 33% of which are -ity, and 67% -ness. (1985:453). Romaine points to the appearance of -ness on minor categories and phrases in modern English as an indicator of the productivity of -ness. As we saw in chapter 2, Aronoff (1976) argues that the high productivity of -ness means that derivations in the affix do not have to be stored in the mental lexicon, unlike derivations in -ity.

Anshen and Aronoff (1988) attempt to quantify the preferences of -ness and -ity for adjectival bases in -ive or -ible. They found that subjects preferred “possible” words on the pattern -iveness rather than -ivity, and on the pattern -ibility rather than -ibleness. These preferences correspond, the authors find, to the ratios of “real” words (as attested in Walker’s rhyming dictionary). When the “real” words are dated according to their first citations in the OED, it appears that both -iveness and -ivity increase over three centuries (1600-1900), but there are consistently more types in -iveness than -ivity. Increases are not consistent as the eighteenth century is actually lower than the seventeenth for both -ness and -ity derivations on -ible and -ive bases. Anshen and Aronoff ascribe this to some “external force” (1988:201). This pattern is repeated for -ness and -ity in the results of the present study, lending weight to an “external force” theory, but sampling discrepancies in Walker’s or the OED cannot be ruled out. -ibility increases over the three centuries, but -ibleness appears to be decreasing, reaching its lowest point in the nineteenth century. For -ible bases, at least, the authors say they must revise their assumption that -ity and -ness are competing choices for modern speakers. However, the
authors have not taken into account the danger of assuming that a dictionary such as Walker’s will adequately represent all forms in -ness (here -ibleness).

Baayen and Renouf’s (1996) study of modern British newspaper English establishes the productive status of both -ness and -ity in this register. After processing roughly 80 million word tokens (equivalent to 40 months of sampling), they observe that there are 11 new types for -ity per month and 29 per month for -ness. Although -ity cannot be said to be unproductive, -ness is considerably more productive. Baayen and Renouf also point to the high degree of affix generalisation shown by -ness (although they ascribe this to semantics rather than productivity) in forms such as: cowness, duckness, redneckness, verbness (denominal), inness and thereness (minor categories) and over-the-top-ness (phrase) (1996:84). Baayen and Renouf observe that -ness is only weakly attested for present participle bases (as in demandingness), confirming that this is no longer a productive pattern in Present Day English. -ity also shows some affix generalisation with forms such as assurity, terrority. The most common base for -ity in the study is -able, then monomorphemic base words, as in anality, loyalty, concavity. This category includes “base words with bound stems” in items such as avuncularity, spectacularity, deviosity.

Putting all these accounts together then, what kind of picture emerges of -ness and -ity over the time period that we are concerned with? There is little dispute that -ness decreased somewhat in productivity after the arrival of -ity in Middle English, but from that point, particularly with the affixation of -ness to foreign bases, -ness is assumed to be consistently highly productive, and more so than -ity because it is less restricted. We also know that -ness is capable of occurring on bases on which -ity appears to be
preferred, for example \textit{able}. There is less agreement about the history of \textit{ity}. There is little dispute that \textit{ity} entered the language in late Middle English, initially through loanwords, and there is also agreement, and evidence, that \textit{ity} does not occur upon native bases. Yet the extent of English derivations in \textit{ity}, and also of Latinate coining in \textit{ity}, is variously reported. The identification of individual items, as in Marchand (1969), provides little idea of how productive these practices were, and for how long. Brian Vickers points out that although the high point of neologizing was supposedly the Elizabethan period, “a glance at the \textit{Chronological English Dictionary} will confirm the impression gained from ordinary reading, that a vast number of Latinate words continue to be coined throughout the seventeenth century” (1987: 19). The productivity of \textit{ity} could thus range from appearing only in early loans and on a restricted set of bases (\textit{-ible, -al, -ar, -ic}), to competing with \textit{ness} on all except native bases. Determining which level of variation between these extremes is true of the corpora is one of the aims of section 5. First, in section 3, I review models of competition in linguistic theory and consider how they might influence the way that we regard \textit{ness} and \textit{ity}. The discussion will also raise some important methodological issues.

\section*{3. Derivational morphology and sociolinguistic variables}

The terms “rivalry” or “competition” are freely applied to derivational morphemes with similar morphosyntactic functions, such as \textit{ness} and \textit{ity} which both form nominalizations from (predominantly) adjectival bases, or similar semantics, such as the negative prefixes \textit{-un} and \textit{-in} (Baayen and Renouf 1996). These relationships are not only restricted to pairs consisting of a foreign and native affix. Competition has been
observed, for example, among the earlier nominalizing native suffixes -hood, -dom and -ship (Riddle 1985, Romaine 1985).

No-one has actually claimed that a particular set of rival derivational affixes is entirely interchangeable, yet the extent of their overlap is hard to state clearly (without copious empirical observation). There is a danger of treating such affixes, especially if they have stylistic or social associations, as sociolinguistic variants in a model of sociolinguistic variation (Labov 1972, Chambers 1995:12-25). This is not to dispute that word-formation patterns can be social and stylistic markers, a possibility suggested by Romaine (1985:457) and a position which I have argued strongly for, but to question whether competing word formation processes can be treated similarly to Labovian sociolinguistic variants, which are the archetypal social and stylistic markers.

The basic requirement for recognising stylistic variants is “referential sameness” (Labov 1972; Traugott and Romaine 1985). For this reason, the ideal variables for the studies pioneered by Labov in the 1960’s were phonological (Lavandera 1996). This made it possible to establish that for speakers in different contexts, the choice of one pronunciation rather than another, is not “promoted by the need to mean one thing instead of another, rather it is affected by the speaker’s place in the linguistic market” (1996:22).

However, Lavandera (1996), as well as Traugott and Romaine (1985), raise concerns with the extension of the sociolinguistic variable from the level of phonology to other levels of structure, particularly syntax. At higher levels of the grammar, it becomes more difficult to establish referential sameness. Units beyond phonology, such as morphemes, lexical items, or syntactic constructions, by definition have a meaning. Since it is impossible to do away with referential meaning, it has been agreed that “for the
definition of a non-phonological linguistic variable the referential meaning of all the variants must necessarily be the same” (Lavandera 1996:22, my emphasis). The problem is illustrated with reference to the variation between the active and the agentless passive, and between get and be passives, constructions for which it is difficult to establish sameness of meaning (Labov and Weiner 1983, Lavandera 1996, Traugott and Romaine 1985). Some examples of syntactic variation can be found in Romaine (1982) which describes variation among different types of relative clause, and Jucker (1992) and Rámó -lin-Brunberg (1991) which describe variation in the complexity of noun phrases. Lavandera also produces an example of “lexical variation”: the expression wiped out is supposedly synonymous with exhausted, only the distribution is different, the latter expression being more frequent in formal contexts. But the situation is not so simple:

It is not the case that ... differences in scores alone are significant, rather, the forms in themselves carry differences in meaning ... It is important therefore to distinguish between frequency relationships which are devices of the language to convey non-referential information, and frequency relationships which are the consequence of the compatibility between the referential, social, or stylistic meanings of some forms and the different contexts in which they may occur. (Lavandera 1996:21)

Lavandera attributes the reluctance to study forms differing in referential meaning which are at the same time socially and stylistically stratified to a fear that this research could be used irresponsibly to support ethnic, racial and class-based prejudices. “This kind of evidence,” she says, “would show that different social groups exchange different types of messages for which they make use of forms with different meaningful structures” (1996:27). Lavandera argues that these prejudices must simply be exposed and dismissed, and that the potential of this “dangerous hypothesis” should not prevent prevent the investigation of variables which may not be referentially identical. She proposes to relax the condition that referential meaning must be the same for all the alternants, preferring
to substitute a "condition of functional comparability". Unfortunately Lavandera does not elaborate on the nature of this condition.

If *-ness* and *-ity* are taken to be referentially the same, and the suffixes can then be shown to have stylistic associations, the pair would appear to qualify as sociolinguistic variants in the Labovian tradition. We must consider, though, that this is derivation, and that each suffix together with a base forms a lexical item, which is then in paradigmatic relationships with other lexical items. Further, nominalization is a word-formation process, but it is also in a relationship of syntactic variation with other constructions, such as finite clauses (in the case of deverbal nominalizations) or adjectives in noun phrases (in the case of deadjectival nominalizations). Is the variable therefore the derivational morpheme or the grammatical construction? It is relatively simple to establish referential sameness for derivational morphemes. But while there is, to use Lavandera's terms, "functional comparability" between derivations and other lexical items, and between nominalizations and certain syntactic constructions, there is also "compatibility" between the referential meaning of a lexical item or a nominalization and the context in which it occurs.

Discussion of the morpheme as sociolinguistic variable is limited. Those studies in which morphological variation is unproblematically assumed are more likely to involve inflectional morphology, for which it is easier to assume referential sameness. Chesire (1978) for example compares the use of the *-s* suffix on the present tense verb stem with the third person subject in standard English, and for the first, second and third person subjects in vernacular Reading English. More historically, take Stein's 1988 account of the gradual substitution of *-s* for *-th* in the third person singular in
Shakespeare’s plays in the late sixteenth century and early seventeenth century. The choice is already available in Middle English dialects, but Stein’s thesis is that the rise of the \(-s\) suffix is fuelled by the emergence of a standard English. Nevalainen and Ramo, Lin-Brunberg (1997) demonstrate for the Corpus of Early English Correspondence the use of \(-th\) or \(-s\) third person singular can vary according to social class and gender.

One of the defining criteria of inflectional morphology is full productivity. What this means in effect, is that the grammatical category represented by a competing pair of inflectional affixes, e.g. present tense for \(-th\) and \(-s\), must be indicated on every instance of a particular grammatical construction. Thus either \(-th\) or \(-s\) must occur with every verb which has a third person singular subject. In the case of derivational morphemes, a rival pair may be the only morphological exponents of a particular category, but the construction (base + affix) can invariably be substituted by a monomorphemic lexical item, or a syntactic construction. For instance, a competing pair of items with negative prefixes such as unremovable or non-removable could be substituted by the lexeme permanent, or conveyed through the use of a sentence negative “cannot be removed”.

It is thus problematic to treat derivational morphemes which “compete” as identical to a situation of inflectional morphemes competing. Of course given that there is no absolute distinction to be made between inflectional and derivational morphology, it is possible that rival derivational morphemes that are practically inflectional, such as adverbial \(-ly\), could have rivals. But it is more likely that typical rival derivational morphemes will behave like \(-ness\) and \(-ity\), which we will see have relatively few common bases. Romaine (1985) does not suggest that \(-ness\) and \(-ity\) should be regarded
as typical sociolinguistic variables. She points out how derivations in these suffixes can
be substituted by lexemes. Yet she illustrates the increased use of \(-ity\) over \(-ness\) in the
Boethius texts by expressing the number of types in \(-ness\) and \(-ity\) as proportions of the
total number types in \(-ness\) and \(-ity\), shown in Table 1. The first figure in each cell
represents the raw number of types in the suffix.

Table 1 –\(ness\) and \(-ity\) formations in Alfred’s, Chaucer’s and Queen Elizabeth’s translations of Boethius

<table>
<thead>
<tr>
<th>ALFRED</th>
<th>CHAUCER</th>
<th>ELIZABETH 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>87-ness</td>
<td>59 –ness 53%</td>
<td>38-ness 50%</td>
</tr>
<tr>
<td>-</td>
<td>52 -ity 47%</td>
<td>38-ity 50%</td>
</tr>
</tbody>
</table>
Romaine 1985:459

This is a fairly standard representation of variation in a corpus, and is used by Stein
(1988) and Nevalainen and Raumolin-Brunberg (1997), but for these derivational affixes,
the combined total of the types of the two suffixes does not represent a set of possible
functional slots, which could be filled by either suffix, and only one of those two suffixes.
Quantificational methods such as this can foster an illusion of “replacement”: where \(-ness\)
appears to decrease in use, the suffix will have been replaced by \(-ity\) on the same base.
The differences shown between \(-ness\) and \(-ity\) might be taken to reflect a straightforward
substitution of one suffix for another, as in \(stability\) for \(stableness\). This may only be the
case for a small number of bases. It must be acknowledged however that Romaine’s
corpus is small and controlled (three translations of the same text), and the likelihood of
the same bases appearing in each of the three texts is high.

In the investigation of the “variation” between \(-ness\) and \(-ity\) in HCE and
ARCHER in section 4, the frequencies of types in \(-ness\) and \(-ity\) are compared, but
occurrences of \(-ness\) and \(-ity\) are not expressed as proportions of the total number of types
of the two suffixes. In section 5, I ascertain how many common bases there are for \(-ness\) and \(-ity\) derivations in ARCHER.

4. \(-ness\) and \(-ity\) in HCE and ARCHER

As for the previous chapter, I will first show the basic type and token frequency for each suffix. Then, as a more accurate measure of productivity, I give the frequency of new types for each suffix, that is, the number of types which are new in each period. Finally, I represent the number of new types as a proportion of the total types for each period.

Tables 2 and 3 below show the token and type frequency for \(-ness\) and \(-ity\) in HCE and ARCHER:

| Table 2 Types and tokens per 100 000 words in HCE |
|-----------------|-----------------|-----------------|
| Period          | 1500-1570       | 1570-1640       | 1640-1710       |
| \(-ness\) tokens| 220.3           | 174.4           | 181.2           |
| \(-ness\) types | 46.3            | 60.6            | 60.8            |
| \(-ity\) tokens | 193.5           | 232.9           | 326.8           |
| \(-ity\) types  | 47.9            | 63.2            | 74.8            |

| Table 3 Types and tokens per 100 000 words in ARCHER |
|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| \(-ness\) tokens| 177.7           | 165.5           | 196.3           | 193.5           | 168.4           | 143.6           | 117.8           |
| \(-ness\) types | 62.3            | 57.5            | 45.4            | 49.1            | 50.5            | 61.8            | 40.7            |
| \(-ity\) tokens | 198.6           | 247.2           | 275             | 289.5           | 200.9           | 216.7           | 282.1           |
| \(-ity\) types  | 66              | 68.4            | 55.5            | 74.8            | 52.5            | 66.4            | 59.4            |

The type frequency for \(-ness\) and \(-ity\) in ARCHER is graphically depicted in Figure 1:

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1 The raw figures are available in Appendix II.
Neither suffix shows a clear aggregation (the gradual increase which results from the types in each period consisting of the types from the previous period plus new types).

From 1500, -ity shows a higher number of types per 100,000 words than -ness.

Interestingly, the two suffixes show roughly similar progress over time. There are three periods in which they appear to diverge. In the 1640-1710 period of HCE, the difference between the type frequency of -ness and -ity is greater than it is in the same time period for ARCHER. In ARCHER 1800-1850 and 1950-1990, the differences are more than 20 types per 100,000 words and just under 20 respectively, whereas the for the other periods the difference is never more than 10. The type frequency can be viewed continuously from Middle English if Dalton-Puffer’s results from the Middle English part of the Helsinki Corpus are added in a normalised form, as in Table 4:

<table>
<thead>
<tr>
<th>Period</th>
<th>1150-1250</th>
<th>1250-1350</th>
<th>1350-1420</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ness</td>
<td>111.4</td>
<td>61.6</td>
<td>58.6</td>
</tr>
<tr>
<td>-ity</td>
<td>6.2</td>
<td>20.5</td>
<td>38.5</td>
</tr>
</tbody>
</table>

(Dalton-Puffer 1996)
In Middle English, the situation is obviously very different. Dalton-Puffer’s results show that *ness* decreases in ME2 (1250-1350) with the advent of *-ity*. After this the performance of *ness* steadies, the results of the present study show that *ness* remains fairly constant until 1750, when it decreases. It remains constant at this new lower level, apart from a rise in 1900-1950. *-ity* increases until 1750, and then decreases in the last half of the eighteenth century. It then reaches a high point in the first half of the nineteenth century, and is high also for the first half of the twentieth century.\(^2\) Table 5 and Figure 2 below show the frequency of new types for *ness* and *-ity* in ARCHER, obtained, as explained earlier, with the use of the first two periods of HCE as a starting lexicon:

<table>
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</thead>
<tbody>
<tr>
<td><em>ness</em></td>
<td>33.9</td>
<td>16.7</td>
<td>18.4</td>
<td>14.6</td>
<td>20.9</td>
<td>22.7</td>
<td>10.3</td>
</tr>
<tr>
<td><em>-ity</em></td>
<td>14.8</td>
<td>19</td>
<td>18.7</td>
<td>19</td>
<td>12.2</td>
<td>12.4</td>
<td>16.3</td>
</tr>
</tbody>
</table>

\(^2\) The peaks for *-ity* the first half-centuries of ARCHER suggest that British only periods have more *-ity* words than the British and American combined periods. A breakdown of the results for British and American texts however shows that *-ity* is actually consistently higher in the American texts. The discrepancies in their half centuries for *-ity* types cannot be due to regional differences.
The first thing that is noticeable from the new types measure is that \( -ity \) is not uniformly more frequent than \( -ness \). While the type frequency of \( -ity \) may be higher than \( -ness \), innovation in \( -ity \) is not always greater than innovation in \( -ness \). The first period of ARCHER (1650-1700) shows the greatest difference in the frequency of new types between \( -ness \) and \( -ity \). The low score for \( -ity \) in that period suggests that not many of the \( -ity \) types in that period are new, but have been borrowed or coined previously. In an attempt to verify whether new types in \( -ity \) are low for that time period or only for ARCHER, I have applied the starting lexicon (the first two periods of HCE) to the last period of HCE (1640-1710), to obtain the number of new types for the last period of HCE for \( -ness \) and \( -ity \). The new type frequency for \( -ity \) is 23.3 new types per 100 000 words, and 35.1 types per 100 000 words for \( -ness \). The gap between the two suffixes is thus smaller for HCE in the last half of the seventeenth century, but the figures for HCE also suggests that \( -ness \) produces more new types than \( -ity \) over this period.
The frequency of new types in –ity remains within a fairly narrow range from 1700 to 1850 (18.7-19 new types per 100 000 words), but drops to 12.2 and 12.4 before increasing to 16.3 in the late twentieth century. The 1650-1700 period of ARCHER is clearly more productive for –ness than for –ity. –ness in ARCHER also remains within a fairly narrow range from 1700 to 1850 (14.6 to 18.4), but then, as –ity decreases, –ness increases from 1850 (20.9 in 1850-1900 and 22.7 in 1900-1950), before dropping to a low of 10.3 in 1950-1990. The result for 1950-1990 is not very reflective of an affix that is productive in Present Day English, as suggested by Baayen and Renouf (1996) among others. The data is presented in a non-normalised form in Table 6 and Figures 3 to 5 below:

Table 6 Percentage of new types out of the total number of types in ARCHER with HCE starting lexicon

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>–ness</td>
<td>54.5</td>
<td>29</td>
<td>40.5</td>
<td>29.7</td>
<td>41.4</td>
<td>36.7</td>
<td>25.4</td>
</tr>
<tr>
<td>–ity</td>
<td>34.6</td>
<td>27.1</td>
<td>33.7</td>
<td>25.4</td>
<td>23.2</td>
<td>17.8</td>
<td>27.4</td>
</tr>
</tbody>
</table>

Figure 3 Percentage of new types out of the total number of types in ARCHER with HCE starting lexicon
Figure 4 Proportion of new types in -ness out of total types for ARCHER with HCE starting lexicon*

Proportion of new types for -ness

old types  new types

* A chi square test shows that new types are not evenly distributed across the periods, for a significance level of p ≤ .05. There was a negative correlation between period and percentage of new types, but this was not statistically significant.

Figure 5 proportion of new types in -ity out of total types for ARCHER with HCE starting lexicon*

Proportion of new types in -ity

old types  new types

* A chi square test shows that new types are not evenly distributed across the periods, for a significance level of p ≤ .05. There was a negative correlation between period and percentage of new types, but this was not statistically significant.
Figure 3 does not present a very different picture from Figure 2. The greatest differences between the suffixes are still in 1650-1700, 1850-1900 and 1900-1950. The somewhat smaller gap for the last period has closed, and the scores are roughly the same. The 1750-1800 period looks different: the percentages of new types for both \(-ness\) and \(-ity\) are higher than the previous period and the following period, and \(-ness\) is now noticeably higher than \(-ity\) for this period. For 1700-1750 and 1800-1850, \(-ity\) is no longer higher than \(-ness\); it is \(-ness\) that is slightly higher than \(-ity\).

Let me present a very crude summary of these results: there is no continuous increase or decrease for either suffix; there is no point at which both suffixes show high scores (relative to their performance in other periods), except perhaps 1750-1800, and no point at which both suffixes show low scores. \(-ness\) is more productive than \(-ity\) in the late seventeenth century, the suffixes correspond fairly closely in the eighteenth century (with \(-ness\) slightly ahead), \(-ness\) is more productive than \(-ity\) in the nineteenth century and the first half of the twentieth, and the suffixes are equal once more in the late twentieth century.

Much of the explanation of these historical developments is reserved for section 6 when distinctions can be made between registers, but I will make some comments here, chiefly on contemporary prescription regarding \(-ness\) and \(-ity\) which can provides some clues about the accuracy of this record of change. Take, for example, Volume II of Bailey's *Universal Etymological Dictionary* (1727), described in Osselton (1958). Bailey brands words which he regards as appropriate only for a formal or "serious" style, and not suited to "plain diction". Out of the 950 branded words, 400 are Latinate. Osselton comments that it is hard to tell whether the compiler felt them to be "foreign or merely
learned" (1958:73). Osselton classifies the branded words in –ity as “hard words” (angolosity, calidity, naturality, ventosity “windiness” and versimility); words that have since become obsolete (curvity and suavity), and words that have remained in currency from Bailey’s time (congeniality, continuity, cupidity, dicacity, fecundity, festivity, fragility, fidity, fusibility, garrulity, gracility, longevity, longinquity, medicity, novity, nudity, numerosity, opacity, paternity, pucidity, secularity, sodality, venality, verbality, and verbosity).

Comparatively few abstract nouns in –ness are branded: denseness, disquietness, restrictiveness, cunningness, ableness, diligentness, directness, salutariness, and beholdingness. Density, disquietude, restrigency, and cunning are recommended as alternatives for the first four. It is difficult to detect any patterns to these preferences. According to Osselton “the compiler merely disliked certain forms of derivation for certain words, sometimes he preferred the Latin and sometimes the native affix” (1958:74). But Osselton does conclude that most of the branded words are words which were going out rather than coming in. Cordialness, preferred to cordiality, was “at that time already obsolescent”. Bailey’s dictionary tells us that around the beginning of the eighteenth century there were large numbers of –ity words which were regarded as strictly learned, and certain –ness words which were regarded as old-fashioned.

Tucker finds stronger condemnation of Latinate vocabulary in eighteenth century reviews. The following words in –ity are objectionable: rivalry, connexity, tranquillity, legerity, nudity, indiscernibility, inanity, senility, eventuality, rigidity, exility; and one Latinate word in –ness: anfractuousness. Tucker comments that often such words were incorrectly perceived as new. Certain –ness words are dismissed as archaic
(mischievousness, plenteousness, grievousness) and two other formations on an older pattern, enlargedness and preparedness, are rejected as Americanisms. It is this period that precedes the decrease in -ity visible in the nineteenth century.

There is some interesting American censure of -ness in the 1960's, notably an article in Time magazine which complains about the attachment of -ness to pronouns, verbs and phrases. Williams (1965) reports complaints from 1961 about the use of -ness forms in place of monomorphemic lexemes, such as proudness for pride, or -ness forms in place of -ity, such as sterileness for sterility. This is perhaps indicative of lay perceptions of the high productivity of -ness at the time, and a precursor to the decreased use of -ness the last half of the twentieth century. In ARCHER, -ness is not twice as productive as -ity in Present Day English, as Baayen and Renouf (1996) suggest on the basis of their corpus.

5. Evidence of variation

In section 2, I cautioned that perceived competition between -ness and -ity does not imply that the suffixes occur interchangeably on a common set of bases. A large proportion of the bases of the types in -ness and -ity, quantified above, are not common to the set of types in -ness and the set of types in -ity. This means that there are relatively few minimal pairs in -ness and -ity in the results of the corpus survey. By way of demonstration, in section 5.1. I identify the minimal pairs for ARCHER. In section 5.2., I perform a more detailed analysis of the data, checking whether the types in ARCHER correspond to the identified structural restrictions for -ness and -ity. In section 5.3. I question whether minimal pairs represent all of the variation that can be said to occur
between the suffixes, and suggest ways in which the analysis of variation should be broadened.

5.1. Minimal pairs

The 8 minimal pairs in –ness and –ity for ARCHER are: densedness/density, falseness/falsity, gentleness/gentility, nobleness/nobility, oddness/oddity, passiveness/passivity, perverseness/perversity, and sensitiveness/sensitivity. These pairs represent 8 –ness types and 8 –ity types out of a total of 426 –ness and 393 –ity types for ARCHER. Some might be quick to point out that even these items are not synonymous and should therefore not be considered minimal pairs, because of semantic divergence, or, as is argued in Riddle (1985), the distinct semantic identities of –ness and –ity. The issue of semantic divergence has to be considered very carefully for minimal pairs in historical texts. Derivations (especially ones in –ity) can demonstrate many different kinds of specialisation, or lexicalization, as we will see. Fortunately, the context supplied by a historical corpus provides clues as to earlier meanings. For the present discussion of minimal pairs, I shall simply attempt to determine on a case-by-case basis whether a semantic distinction is operating. The pairs are given below in their contexts of occurrence:

oddity/oddness:

(1) by this time Peregrine, much confused by the oddness of this adventure, had departed. Thomas Flatman, Don Juan Lamberto. (1661)

(2) I think the remark I heard you make was something about the oddity of an individual going about London in deadly fear of a young man with spectacles? George Eliot, Silas Marner. (1861)
sensitivity/sensitiveness:

(3) The extreme sensitiveness of the Japanese in regard to the respect due to the Throne has converted an essentially trivial incident into one which has seriously diminished the Government's prestige. Pall Mall Gazette. (1905)

(4) The Prime Minister's sensitivity to the pay and prices issue is indicated by an unpublicised intervention to stop further increases in gas and electricity prices this autumn. Manchester Guardian. (1959)

passiveness/passivity:

(5) Kingcote we know pretty well by this time - his amiability, his dangerous passiveness, his diffidence, his emotional excess. George Gissing, Isabel Clarendon. (1886)

(6) It died away, and left her with a bounding heart and a reddened cheek, and a sense of intense participation in the events of the moment, instead of the lifeless passivity of five minutes before. Edith Somerville and Martin Ross. The Silver Fox (1897)

perverseness/perversity:

(7) It shewed me one thing, however, which I have long suspected but which female perverseness has contrived to keep concealed ... Edward Fox, The Journal of the Hon. Henry Edward Fox, The Earl of Ilchester. (1824)

(8) and so dowie was I with the thoughts of what I had witnessed of the selfishness, the sinfulness, and perversity of man, that I grew more and more home-sick David Macbeth Moir, The Life of Mansie Wauch, Tailor in Dalkeith. (1828)

falseness/falsity:

(9) But the humility which you laud in a character such as that of Macready has always to me a certain falseness about it. The letters of Anthony Trollope. (1876)

(10) Those News-writers who have asserted the contrary, and even mentioned the conditions of the accommodation, unluckily discovered the Falsity of their Assertion by an extreme Ignorance, in saying, amongst other, that the King of Denmark would give up, at the Expiration of six Years, all the Duchy of Holstein. The Public Advertiser. (1762)
gentleness/gentility:

(11) Mrs. Bennet was in her fit, concluded with saying, she believed the serjeant would make the best husband in the world: for that he had great tenderness of heart, and a gentleness of manners, not often to be found in any man; and much seldomer in persons of his rank. Henry Fielding, Amelia. (1751)

(12) If, with all the Charms I am Mistress of; with Gentility, Wit, Ease of Conversation, and my Remains of Beauty ... I can but make a Conquest of that Great Man. Anonymous, A Letter from Mrs. Jane Jones. (1737)

nobleness/nobility:

(13) The company laughed at his civility to a slave, and Caesar only applauded the nobleness of his passion and nature. Aphra Behm, Oroonoko, or, the Royal Slave. (1688)

(14) The Nobility, Gentry, and Public in general are respectfully informed that on Monday next will be presented, with entirely new Scenery and Decorations, Shakespere’s Tragedy of Hamlet, Prince of Denmark. James Robinson Planche, The Garrick Fever. (1839)

density/denseness:

(15) Babbie should have been grateful to his denseness, but it merely set her mind at (1 rest. J.M.Barrie, The Little Minister. (1891)

(16) as if the incident and Refracted Angles were on the Surface of a Sphere of Air of the same uniform Density close adjoyning to the Eye. Edmund Halley. Some Remarks on the Allowances to be made in Astronomical Observations... Philosophical Transactions. (1721)

The pairs in 1 to 12 refer to the same quality or attribute. This is particularly interesting in the case of oddity in 2, which is usually cited with its early nineteenth century lexicalized meaning of a concrete entity (Romaine 1985). An item in the above set which does have a lexicalized meaning is nobility in 14, classified by Romaine as a “collectivity”. The difference in meaning between denseness (15) and density (16) arises from the metaphorical use of denseness.
When derivations not in minimal pairs in ARCHER were checked against the OED, 207 of these types were found to have a counterpart in the alternate suffix in the OED. Types in ARCHER with a variant form in the OED were predominantly \(-ity\) derivations, their variant forms in the OED being derivations in \(-ness\). Only 12 of the types in the corpus with a counterpart in the OED were in \(-ness\), the OED counterpart being in \(-ity\). Of the remaining types which did not have a counterpart in the OED, 189 of these types were in \(-ity\), and 405 of these were in \(-ness\). The high number of types in \(-ness\) in ARCHER which do not show any interchangeability with \(-ity\), not even with the OED data, is an indicator of the number of \(-ness\) types in ARCHER on native bases. The reported tendency of \(-ness\) to occur on foreign bases has only emerged from the items which appear in the OED, which are rarer and less likely to appear in a corpus. In section 5.2, the composition of the types in \(-ness\) and \(-ity\) is examined more closely and compared to the identified tendencies of \(-ness\) and \(-ity\) to occur on bases of a particular morphological shape.
5.2. Structural restrictions

There are 8 types in –ness on adjectival bases in –able/-ible (agreeableness, changeableness, unchangeableness, deplorableness, reasonableness, teachableness, unreasonableness, uncharitableness, inevitableness), compared to 55 items in –ity on adjectival bases in –able/-ible. None of the minimal pairs are on an adjectival base in –able/-ible, although 42 of the 207 types with a variant in the OED are in –able. The –ableness types in ARCHER all first occur before 1900. They are fairly evenly distributed across time until 1900. The data confirms that –ity is preferred for –able bases, and that this is more the case in the twentieth century than any other time.

Anshen and Aronoff (1988) claim that the pattern –iveness is preferred to –ivity in modern English, as well as in earlier periods, although the gap has widened. In ARCHER there are 21 types of the pattern –iveness and 11 of the pattern –ivity, confirming this preference. The evidence that this proportion has changed over time in ARCHER comes from the two Modern English periods 1850-1900 and 1950-1990, which both show greater concentrations of –iveness.3

For adjectival bases in –al, ARCHER shows only 2 nominalizations in –ness (tragicalness, unusualness) occurring fairly late in 1850-1900 and 1950-1900 respectively, compared to 45 nominalizations in –ity, confirming that this adjectival base predominantly takes –ity. There are no –ness nominalizations on adjectival bases in –ic, but 7 such nominalizations in –ity: authenticity, catholicity, electricity, pathogenicity, periodicity, rhythmicity, seismicity. Similarly, there are no –ness derivations on adjectival

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3 The periods 1850-1900 and 1950-1990 have 7 and 5 types in –iveness respectively, compared to a maximum of 3 types in –iveness for all other periods, and compared to 1 and 3 types in –ivity.
bases in –ar, but 9 in –ity: capillarity, familiarity, similarity, molecularity, polarity, popularity, regularity, solidarity, and vulgarity.

The case of adjectival bases in –ous is somewhat more complex, and raises important questions for the historical study of variation between –ness and -ity. Returning briefly to the discussion in chapter 2, we saw that when Aronoff investigates the productivity of adjectival bases in –ous (with regard to the phonological factors promoting or discouraging derivation in –ity) he is, with the help of Walker’s rhyming dictionary, able to cite derivations with reference to their –ous adjectival bases. It is perhaps significant that the only pairs researched in Anshen and Aronoff’s more historical study are -ableness/-ability and -iveness/-ivity, which do not undergo truncation or change in vowel quality before –ity. To study derivations from –ous adjectival bases diachronically, it is necessary to anticipate truncation and trisyllabic shortening in order to correctly identify derivations from adjectival bases in –ous. If this process is followed for ARCHER we find 29 types in –ness on –ous bases (such as maliciousness, voluptuousness, officiousness) and 31 types in –ity with corresponding adjectives in –ous (such as hilarity, incredulity, voracity). This yields an additional minimal pair from ARCHER: disingenousness/disingenuity. If the data from the OED is included, there are 42 –ness counterparts to –ity derivations on –ous, showing for instance that enormousness exists in the OED as a counterpart to enormity, and magnanimousness as a counterpart to magnanimity, etc.

The problem with such an exercise, however, is that many of these –ity derivations may have been formed on a Latinate pattern, often before the adjective is even borrowed, for example hilarity is dated as 1500 and hilarious as 1823 (Marchand
As we have noted, in a historical study it is impossible to determine the knowledge or understanding with which speakers are using or coining a derivation, a point which emerges very clearly in a situation such as this one. I will therefore recommend that pairs such as curiousness/curiosity be treated as instances of lexical variation, rather than evidence of morphological variation between –ness and –ity.

Finally, with regard to change in the bases which may occur with –ness or –ity, ARCHER has 8 participial bases (all past) which occur with –ness: blessedness, drunkenness, doggedness, engagedness, fixedness, indebtedness, retiredness, and sunspottedness. These are evenly spread over time, the last, sunspottedness occurring in 1900-1950.

I will dwell no further on structural restrictions. They are useful for obtaining a picture of the limits of variation. Roughly, texts might be expected to fall somewhere between the following three points:

(i) only –ness on native and foreign bases, apart from some early -ity loans.
(ii) -ness on foreign and native bases; -ity on early loans but also restricted set of adjectival bases such as –able.
(iii) –ness on native bases only, -ity on all other bases.

Structural restrictions ultimately account for little of the variable distribution of –ness and –ity. Numerous types fall outside the set of types with restricted adjectival bases. But even for those items which do correspond to an identified structural restriction, the restriction does not tell us why we have a nominalization in, for instance, –ability in the
first place. Before moving on to that sort of explanation, I would like to develop my suggestion of variation on the basis of lexis rather than morphology.

5.3. Expanded analysis of variation

An analysis of the variation between –ness and –ity which takes the lexeme as the unit of variation instead of the morpheme opens up the possibility of including in the analysis a range of other choices that have to do with the relationship of competition between –ness and –ity, but would not be catered for by a conventional account of the relationship between –ness and –ity.4 I have, as far as possible, attempted to establish that the lexical items in 5.3.1. – 5.3.5. fulfil the criterion of sameness of meaning.

5.3.1. -ness and -ity with variant forms of the base

The set of minimal pairs in –ness and –ity in section 5.1. were, according to a model of morphological variation, identified strictly according to the structural identity of their bases. However, if, for the reasons given above, a model of lexical variation is preferable, with hypothetical historical speakers making choices at the level of the lexeme, then it is no longer necessary to apply this strict criterion of identity of the base. This would immediately admit as evidence of variation other pairs in which the –ity derivation shows trisyllabic shortening in the base, such as profaneness/profanity and humaneness/humanity. But these are fairly minor adjustments. If our model of variation targets choices between lexemes, then we might want to extend the evidence of variation

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4 The description of the loss and replacement of Old English and Middle English –ness derivations in Riddle (1985) (see chapter 6) actually employs a similar model of variation (–ness types are substituted by derivations in other affixes and monomorphemic lexical items), but Riddle does not explicitly identify this as variation.
to -ness and -ity pairs the bases of which are etymologically related, however distantly, for example: fierceness/ferocity, clearness/clarity, and humbleness/humility. An excellent illustration of this is Williams’ documentation of responsiveness for responsibility, where it is the derivational affix of the adjective base that varies (1965:284).

For a better representation of the full picture, we should take note of not only the -ity derivations/Latinate coinings/loanwords that compete with -ness types. The following items from ARCHER might be regarded as etymologically related variants of expertise, tragedy, inertia, and gratitude: expertnes (News 1750-1800), tragicalness (Letters 1850-1900); inertness (Letters 1900-1950); gratefulness (Fiction 1950-1990).

5.3.2. Derivations in other deadjectival nominalizing suffixes

The deadjectival nominalizing affixes, -acy and -ancy/-ency, have not been identified as morphological rivals, for each other or for -ness or -ity. This has much to do with the greater restrictions imposed on these affixes: -acy occurs only on adjectival bases ending in -ate and -ancy/-ency occurs only on adjectival bases in -ant/-ent. Fewer restrictions on -ness however mean that it is possible for -ness to occur on adjectival bases that typically nominalize in an adjectival suffix other than -ity. Marchand cites the accuracy/accurateness pair as an instance of variation between -ness and -acy (1969:335). ARCHER features 4 types in -ness on adjectival bases in -ate: inadequateness, accurateness, privateness and obdurate, given in 17 to 20 in their contexts of occurrence. These derivations appear to have the same meaning as inadequacy, accuracy, privacy and obduracy, with the possible exception of private which is used in the sense of a private matter rather than the quality or state of privacy.
(17) Perhaps, exclusive of other irregularities, we must announce the commencement of such an enterprise a great presumption in a female, on account of the *inadequateness* of her nature. Herman Mann, The Female Review. (1797)

(18) yet how lazy or unwilling the whole Tribe is to make proof, either of that force or kind of Subterraneal Steams, or of Celestial or Ethereal influences; no, not of the Moon, or any Planet or Constellation, to any considerable *accurateness*. Anonymous, An extract of a Letter... Philosophical Transactions 10. (1675)

(19) Only sometimes in a large room at a tavern, she would step to an odd corner with one of them, who pretending some *privateness* would then desire to know when he might wait on her at her lodging. Francis Kirkman, The Counterfeit Lady Unveiled. (1673)

(20) Lovers may talk of their sufferings by their Mistress frowns, or *obdurateness*, but let any one judge of mine by the blows I received. Richard Head and Francis Kirkman, The English Rogue: Described in the Life of Meriton Latroon. (1665)

These *-ness* derivations are a good indicator that *-ness* is dominant in that particular document. The derivations in 18, 19 and 20 are seventeenth century and *inadequateness* in 17 is eighteenth century. There are no *-ateness* derivations after 1797. The pattern does not appear to continue into the nineteenth century. Despite the apparent prevalence of modern *-ness*, modern English is characterised by following the learned classical patterns where they exist. ARCHER has no *-ness* derivations on adjectival bases in *-ant/-ent*.

Suffixes which do not typically form nominalizations on a deadjectival pattern may have formed derivations on a deadjectival pattern in the past and in this way presented competition for nominalizations in *-ness* and *-ity*. Dalton-Puffer explores competition among a subgroup of abstract noun suffixes in Middle English, namely *-ness, -hede, -ship, -dom, lac, reden* and *-th* (all Germanic) and *-ite* (Romance) (1996:126). A considerable number of bases (approximately 50 in the Middle English part of the Helsinki Corpus) occur with several of these suffixes, for example, *hethen* (*hetheness,*
hethenhood, hethenship). According to Dalton-Puffer, 18 of these bases (36%) occur with
two or more different derivational suffixes in one and the same text. All derivations
belong to the class Nomina Essendi (paraphrased as “quality of being A”). Doublets
occur “practically exclusively” with deadjectival formations. Dalton-Puffer comments
that two quite varied conclusions can be drawn from the existence of so many parallel
derivatives: “either the suffixes were semantically differentiated sufficiently to make
these apparent doublets ‘different words’, or the abstract noun suffixes involved could be
used interchangeably.”

5.3.3. Morphosyntactically different derivations in competition

It is unsurprising that derivations in -ness and -ity should compete with other deadjectival
nominalizations. But there also appears to be evidence that deadjectival nominalizations
are occasionally synonymous with deverbal or denominal nominalizations with
etymologically related bases. The most likely –ness candidates for competition with
deverbal or action nominalizations are those which are also deverbal, such as devotedness
in 21 which has a past participial base:

(21) During three weeks the fever raged in Mont-Saint-Jean with the greatest violence;
nothing could exceed the devotedness displayed by Madeleine, M. Detrimont, M.
Bignon, and his friend M. Morel. Julia Kavanagh, Madeleine: A Tale of
Auvergne. (1848)

Devotion (also in ARCHER) would also be appropriate in this context. Likewise,

addictedness (HCE 1661) is interchangeable with addiction. But there are also –ness

5 Of course there is a relationship of variation between deverbal nominalizations in -(0)ion and in –ment,
not to mention –ing, but the account of variation here has been restricted to variation between deadjectival
nominalizations and any other derivational processes they might compete with.
items with adjectival bases which appear to compete with action nominalizations. These
adjectival bases are often deverbal, in -ive, for example from ARCHER: competitiveness,
submissiveness, affectionateness, completeness, distinctiveness, preciseness,
attentiveness, adhesiveness, all of which could possibly vary with competition,
submission, affection, completion, distinction, precision, attention, adhesion. The last two
items are given in 22 and 23:

(22) lett me intreat you to do itt moderately, that you may not prejudice your health by
over-much or over-long attentiveness to any thing. Henry More, The Conway
letters: The correspondence of Anne, Viscountess Conway, Henry More, and their
friends. (1664)

(23) Of interest is the finding that the same stimuli that enhance the adhesiveness of
granulocytes also increase the expression of Mol on the surface of granulocytes
several-fold. M. Amin Arnaout, et al., Increased expression of an adhesion-
promoting surface glycoprotein in the granulocytopenia of hemodialysis. New

In both 22 and 23 however, the -ness derivation may involve greater emphasis on the
attribute or characteristic rather than an action. Bailey’s (1727) dictionary condemns
abjection and favours abjectness, but condemns deliberateness in favour of deliberation
(Osselton 1958:74). The difficulty with these pairs is that they are only likely to be
synonymous in certain contexts. There are contexts in which it is unnecessary to
distinguish between behaviour (prolonged or cumulative action) and an attribute or
quality, and in these contexts either the deverbal nominalization or the deadjectival
nominalization is appropriate. Deverbal nominalizations tend to lexicalize as qualities, a
phenomenon which will be examined in greater detail in chapter 6.

Deadjectival nominalizations in -ness and -ity vary also with nominal
nominalizations, chiefly in older native affixes such as -hood, -dom and -ship. Rascality
(ARCHER) has three alternative forms in the OED: rascalry, rascaldom and rascalship. This can be compared to the competing derivations shown in the OED for one item in -ism (denominal) from ARCHER, namely old-maidism: old-maidery, oldmaidishness, old-maidenhood, and old-maiddom span the eighteenth and nineteenth centuries. This last example suggests that the extent of the variation is always greater than supposed, and a full investigation of terms which appear in all or some of -hood, -dom, -ship, -ism and -ness is clearly called for. The number of nominalizations of old maid may be due to the fact that the term has unestablished, colloquial and pejorative status, yet is culturally highly salient. Samuels observes that “for each individual base, one affix is more acceptable than others, but that is merely the end result of a long period of competition. propensity (1530), propenseness (1568), propensity (1570) and propensitude (1607) were all used in the seventeenth century in the general sense of “inclination”, “disposition”, “tendency”. Only later did propensity become the preferred form (Samuels 1972: 62-3). A good deal of what is termed “malapropism” is simply variation with derivations in other affixes (morphosyntactically similar or not), for which the less established term is proscribed, for example, understandment for understanding, trivialism for triviality and rejectance for rejection (Williams 1965:283). On the whole the evidence of competition between morphosyntactically different nominalizations, and possibly derivations, is fairly thin, but further investigation may well alter our view of relationships between word-formation processes.

5.3.4. Synonyms in -ness and -ity with etymologically unrelated bases

Up to this point I have targeted only those competing derivations with etymologically related bases. Insisting on such a relationship between the bases provides one with a
certain amount of assurance that the derivations will fulfil the criterion of sameness of meaning. But the choice between, for instance, madness and insanity, derivations in -ness and -ity with etymologically unrelated bases, cannot simply be ignored, especially if we are proposing that this choice takes place on the level of lexis. These pairs have to be considered as part of the picture of variation between -ness and -ity. Besides madness and insanity, the following etymologically unrelated synonyms in -ness and -ity can be identified in ARCHER: hollowness/cavity, easiness/facility, faithfulness/fidelity, unfaithfulness/infidelity, happiness/felicity, fruitfulness/fertility, hopelessness/futility, likeness/similarity, nearness/proximity, veracity/truthfulness and fairness/impartiality. It appears that in Early Modern English such pairs are employed as a stylistic device, which can be demonstrated by the following pairs in 24 to 27 from HCE:

(24) I have laboured with as much perspicuity and plainnes, as possible I could, to deliver the truth of my honest and faithful good meaning. Clowes, Treatise for the artificiall cure of struma. (1602)

(25) The causes of the stone are continuall crudities or rawnesse, or undigested humors. Turner, A New Boke of the Natures and Properties of All Wines. (1568)

(26) Therefore for two causes it hath fewer dregges and lesse terrestritie or grosse earthynesse the the Clared wine hath. Turner, A New Boke of the Natures and Properties of All Wines. (1568)

(27) What of the friability or brittleness of some others, and the like? Hooke, Micrographia. (1665)

Pairs such as perspicuity and plainness are idiomatic, but these word pairs are more ubiquitous than a few stock phrases. Koskenniemi (1975) has studied these pairs in Middle English (The Book of Margery Kempe) but claims that the linguistic pattern is
favoured “by many different literary periods and styles” (1975:212). Rissanen (1975:255) confirms that repetitive word pairs were very popular in Renaissance prose. Koskenniemi produces examples of pairs which consist of verbs, non-derived nouns, and adjectives, but late Middle English mystical writers seem to have a predilection for nominal verb forms: “the abstract and elusive nature of the mystical revelations has given rise to special types of verb pair, some of which are modelled on Latin originals” (1975:216). Word pairs are predominantly synonymous⁶, although metonymic and antonymous pairs are also possible. In word pairs in which one member is often a Romance loan and the other a native word, Koskeniemi and Rissanen⁷ concur that this is partly a device to interpret loanwords, but it also has a decorative and emphatic purpose.

5.3.5. Competition between derivations in –ness and monomorphemic lexemes

Lexical competition which does not involve a choice between –ness and –ity, but between a derivation in –ness or –ity and a non-derived lexeme, is relevant to the relationship between –ness and –ity. It is relevant insofar as the interchangeability of –ness/–ity derivations with non-derived lexemes will reflect the availability of –ness/–ity derivations for competition with each other.⁸

Cases of variation between a base and the derivation of that same base for deadjectival nominalization⁸ include: fatness/fat, deceitfulness/deceit, futurity/future and

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⁶ Koskenniemi (1975) notes that in general it is extremely difficult to say anything definite about the degree of closeness of the two synonyms. In the case of the Romance and native pairs, the members can have different connotations.

⁷ See also Robinson (1972).

⁸ Williams (1965) records the use of initiativeness rather than initiative.
healthiness/health\(^9\). Although we are not concerned with deverbal nominalization in this chapter, there is an interesting case of apparent variation between the noun conversion of a verb and the nominalization of that verb, for example, \textit{transport} (n.) versus \textit{transportation}. According to the OED the action nominalization \textit{transportation} was not used in the sense of “the action or process of transporting, conveyance” past 1669, “probably to avoid association with penal transportation” and the conversion \textit{transport} was used instead. However, \textit{transportation} appears in later texts in ARCHER with the original sense. This is a US usage, and in 28, \textit{transportation} appears as part of an American label. The British word \textit{transport} appears in the same article:

(28) Mr Feinstein is incidentally a municipal official, being the head of \textit{transportation} for the borough of Manhattan. He was appointed some time ago by Mayor Wagner who, however, is against Mr Feinstein's ingenious attempt to “parlay” his control of city \textit{transport} with his stated intention to enlist some of it as a rebel army against the police. Manchester Guardian. (1959)

Similar variation between a conversion and a nominalization might be applied to \textit{export/exportation} and \textit{import/importation}, and possibly other noun conversions where there is also an action nominalization.

But once again, I will not restrict the discussion to cases which are etymologically related. I will focus on variation between a derivation in \textit{ness} and a monomorphemic lexeme through an intensive case study of the pair \textit{bigness} and \textit{size}. These items are no longer synonymous, and the case study therefore offers us the opportunity to examine this change. Tables 7 and 8 show the shift to \textit{size} rather than \textit{bigness} across the subperiods of HCE and ARCHER. The percentage

\(^9\) \textit{Health} itself was originally a derivation.
in each case is a percentage of the total number of tokens of *bigness* and *size* in that subperiod:

Table 7 *bigness* and *size* in HCE

<table>
<thead>
<tr>
<th>Period</th>
<th>1500-1570</th>
<th>1570-1640</th>
<th>1640-1710</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>bigness</em></td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td><em>size</em></td>
<td>0%</td>
<td>0%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Table 8 *bigness* and *size* in ARCHER

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>bigness</em></td>
<td>72.2%</td>
<td>33.3%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td><em>size</em></td>
<td>27.8%</td>
<td>66.6%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The lexical item *size* was not always employed to the extent it is today. The word *bigness* was used with regularity with the meaning of modern *size* until the middle of the eighteenth century, as in:

(29)  About seven years before, the very like case had befallen him, Voyding two stones after the same manner, and about equall *bigness*. Philosophical Transactions vol. XV, ARCHER. (1685)

(30)  and being born grows in *bigness* twenty years; then put upon your hook a small piece of Scarlet about this *bigness* (figure omitted). Walton, The Compleat Angler, HCE. (1676)

(31)  and sometimes they seized him more frequently, each paroxysm only going off after passing stones of *various bigness*. Medical Essays and Observations Vol. III, ARCHER. (1735)

(32)  a small black spot, about the *bigness* of a herring scale, appeared (not where the wound was, but) on the middle of the red part of the lip. Medical Essays and Observations Vol. III, ARCHER. (1735)

The use of the adjective *vast* preceding *bigness* is a possible indicator that the term *bigness* did not in fact independently imply large *size*:

(33)  the Liver we found very large and hard, of the Colour and substance of a boyled one. It adhered to the Peritoneum on the external part, and by its vast *bigness* had
so straitned the Thorax, that there was very little room for the Lungs.
Philosophical Transactions Vol. XV, ARCHER. (1687)

*Size* is used with its modern meaning from an early stage (at least the mid seventeenth century) and thus is for a long period concurrent with an identical use of *bigness*:

(34) the Glandula Pinealis firm and fair, well colour’d to look on, of the exact Figure, and ordinary *size*. Philosophical Transactions Vol XV, ARCHER. (1686)

(35) and the right ureter, about the middle, was totally obstructed by a stone of the *size* and shape of a horse-bean. Medical and Philosophical Commentaries Vol. III, ARCHER. (1775)

By the end of the eighteenth century *bigness* can no longer be used in the sense of *size*, and the only interpretation *bigness* could have in Modern English is “the property of being big or large”. The meaning of the term in *-ness* has thus become transparent and conformed to the typical sense of the word-formation process, that of denoting a quality or attribute. The ‘neutral’ concept *size* then became denoted exclusively by a non-transparent lexical item. In the following example, some of the uncertainty accompanying this gradual change is illustrated by the simultaneous use of *greatnes* and *smalnes* to convey the concept of the indefinite size of an as yet unencountered object:

(36) And he that is chosen to be the Operator of the said action, must prudently and wisely ... consider the *greatnes* and *smalnes* of the said Tumor, which must be incised and cut. Clowes, Treatise for the artificiall cure of struma, HCE. (1602)

There is however little reason for this account to be restricted to only 2 lexical items.

*Largeness* is also use to express the concept of *size*. *Largeness* and *bigness* can alternate, perhaps to avoid repetition:

(37) and distended to the *bigness* of a Child’s Head: and at the entrance of the Ureters on each side were two Protuberencies; of the *bigness* of a Hens Egg each, the
Ureters were of the largness of the small Guts in Children. Philosophical Transactions Vol. XV, ARCHER. (1687)

*Greatness* and *magnitude* can be added to the list, although these two are not exclusively used to denote physical dimensions:

(38) except the Liver; which I am now going to describe to you. Its *magnitude* was not extraordinary, but seemed rather less than usual. Philosophical Transactions Vol. XV, ARCHER. (1685)

These items form a lexical field, a concept which can usefully be incorporated into an account of variation involving derivations. Romaine (1985) identifies a lexical field in her description of the dynamic relationships between *steadfastness*, *steadiness*, *stableness*, and *stability*:

Another case concerns the equivalents used by Chaucer and Elizabeth for Alfred’s *faestnes/fastrædnes/unastrædnes*. Chaucer has three choices, *stedefastnesse*, *stableness*, and *stabile*. When Chaucer writes *unstableness*, Elizabeth has *unstabilitie*. In addition to the French form *stabilité*, which Chaucer and Elizabeth share, Elizabeth also has *constancy* which is sometimes the equivalent of Chaucer’s *stabile* or *stableness*. Elizabeth also uses the term *mutabilitie* where Chaucer writes *unstableness*, although in some cases Chaucer also uses *mutabilitie*, these are matched by the use of *mutabilitie* in Elizabeth; but Chaucer also uses *chaunge* or *chaungying*. (1985:460)

The lexical field of *size* which I examine above is one which is prominent in technical writing, as is evident from the citations. Unsurprisingly, lexical fields in this genre will often have to do with scale and measurement. Before examining further lexical fields of this kind however, the notion of lexical field employed here should be clarified. The broad definition of “lexical field” is “the set of lexemes in any one language-system which cover the conceptual area and by means of the relations of sense which hold between them, give structure to it” (Trier in Lyons 1977:254). These lexemes may be semantically related paradigmatically or syntagmatically. The relations we are concerned with here are paradigmatic. This definition refers to lexemes, and makes no specifications
concerning derivations. Kastovsky (1981) has considered the idea of the lexical field in relation to word-formation.

The relations which characterize lexical fields may be hierarchical, such as those between an archilexeme (ship) and its hyponyms (steamship, steamer, freighter, tanker, frigate schooner), or non-hierarchical, such as the relations between the hyponyms. He suggests that these non-hierarchical relations between hyponyms that describe word-formation: steamship is a compound and steamer and tanker are agent nouns. These formations are on a level with lexical items such as frigate. The further down the hierarchy of lexical organisation one moves, the more the hyponyms approximate synonymy, yet the structure always allows room for specialisation. Speakers may make use of this potential specialisation at any time, or they may use the hyponyms interchangeably.

The notion of a lexical field is an appropriate diachronic treatment of what synchronic morphologists refer to as “blocking”. Blocking is invoked when the prior existence of a lexeme or derivation prevents the formation of a derivation with the same meaning (Bauer 1983). Yet this process should be compared to others, such as the displacement of a previously existing derivation with a non-derived lexical item (most likely a borrowing) as in the case of the replacement of bigness by size in the eighteenth century. Whereas blocking is a synchronic concept, the notion of a lexical field is one that is fluid and constituted in diachrony: “not only do we find previously existing lexemes disappearing and new lexemes coming into being throughout the history of the language; the relations of sense which hold between a lexeme and neighbouring lexemes in the system are continually changing through time” (Lyons 1977:252).
The developments shown by bigness may not be unique to the size field, as there are instances of goodness being used in the "neutral" sense of quality.

(39) So that errors of the understanding are answerable to the two other, being defective both in the quantity and goodness of its knowledge. Hooke, Micrographia, HCE. (1665)

It is the borrowed term in -ity that comes to denote the "neutral" meaning, and the -ness derivation becomes more transparent. Note also in 40-43 the interchangeability of items in a lexical field subsuming humidity, moistness, moisture and wateryness:

(40) For by this warmth and humidity, the abdominal muscles, peritoneum and intestines, are greatly relieved from their tenseness. Medical Essays and Observations Vol. III, ARCHER. (1735)

(41) And why he is colde and moyst, is, that he shoulde, by his coldnes and moystnes, abate and temper the exceeding heate and drought that commeth from the harte. Vicary, The Anatomie of the Bodie of Man, HCE. (1548)

(42) Let all these lye infused & buryed in horse dung the space of a month, then Boyle altogether till the watrynes be consumed: then strayne it strongly. Clowes, Treatise on the artificiall cure of struma, HCE. (1602)

(43) For as in vegetable substances, I see no great reason to think that the moisture of the Aire ... should evaporate, or exhale away any faster than the moisture of other bodies. Hooke, Micrographia, HCE. (1665)

It appears that for some time, the words humidity, moisture and moistness were interchangeable in the early medical and scientific texts above, to an extent that is no longer possible in Modern English. In 40, humidity does not refer to the water vapour content of the air, but to a more general property of "wetness". The modern sense of humidity is realised above in 43 as "the moisture of the Aire". In Modern English, moistness and wateryness can denote attributes only, but watryness in 42 refers more concretely to fluid matter. Beyond this, one might ask: to what extent these latter two derivations likely to occur in modern scientific writing? Is there an association then,
between the specialisation in meaning of derivations and their restriction to certain contexts?

The analysis can be replicated with reference to fields such as *heaviness*, *lightness*, *gravity* and *weight*, or *rapidity*, *rapidity*, *celerity*, *velocity* and *speed*, prior to the specialisations of meaning that have occurred for selected members of these sets.

Aside from depictions of scale, in medical writing we find rivalries such as *illness*/*sickness* versus *disease*, *infirmitv*, and further contenders *malady* and *fever*.

*Disease* may have developed a specialised meaning of "a type of illness", but again there seems to be a period of interchangeability. These early developments prefigure the situation in medical writing in Late Modern English where words in *-ness* are used only to refer to generalised symptoms, for example *tenderness* and *uneasiness*. Further comments about the specialization of some terms rather than others are reserved for section 7. Before examining these items in their contexts of occurrence, let us first gain a sense of the overall distribution of *-ness* and *-ity* according to text type or register.

6. **Extralinguistic factors: register**

The association between the suffixes *-ness* and *-ity* and register which partly prompted the present investigation is made by Romaine (1985) and Riddle (1985). Romaine claims that developments in the suffixes in Middle English are connected to religious and philosophical discourse. These "literate genres" rely heavily on nouns denoting abstract qualities, and *-ity* and new hybrid *-ness* formations are introduced in Middle English translations (1985:464). Riddle, who arrives at a similar conclusion, argues further that this discourse was not restricted to the upper classes but made available to the common
people, citing the Wycliffe bible as an exemplar. Of the French and Latin loans in religious discourse, many are abstract nouns (1985:452).

These studies are primarily concerned with developments in Middle English, and so there is little information about whether \(-ness\) derivations on non-native bases and derivations, Latinate coinings or loanwords in \(-ity\) continued to be common to these literate genres, and even less about their use in other registers. Neither Riddle nor Romaine suggest that the individual suffixes might differentiate for registers. Indeed, if this development takes place it is likely to be later than Middle English. Vickers (1987) suggests that Early Modern Latinate coining takes place chiefly in scientific writing. There is every reason to suspect this will be true for \(-ity\) as it was for \(-(t)ion\). The existing empirical information about deadjectival nominalizations generally and for the individual suffixes is either for all registers (Dalton-Puffer 1996) or single registers (Romaine 1985, Baayen and Renouf 1996)\(^{10}\). In this study a range of registers are compared. I also identify registers which are productive in both suffixes, and registers which may have a concentration of one of the suffixes. Once again, ARCHER forms the basis for this study of register differences. Tables 9 and 10 show the number of new types in \(-ness\) contributed by each register to the total number of new types in \(-ness\) for that period. The figures are normalised for 100 000 words.

\(^{10}\) Baayen and Renouf’s study is conducted in a single register, namely news reportage, but the authors demonstrate that the productivity of \(-ness\) and \(-ity\) in that study does not differ substantially from the Celex/COBUILD database.
Table 9 Distribution of new types in \textit{ness} per 100 000 words across registers in ARCHEX

<table>
<thead>
<tr>
<th></th>
<th>Drama</th>
<th>Fict</th>
<th>Journ</th>
<th>Legal</th>
<th>Letter</th>
<th>News</th>
<th>Scienc</th>
<th>Medic</th>
<th>Serm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>15.4</td>
<td>44.9</td>
<td>9.1</td>
<td>-</td>
<td>22.2</td>
<td>12.2</td>
<td>42.3</td>
<td>24.5</td>
<td>70.7</td>
</tr>
<tr>
<td>1700-</td>
<td>4.1</td>
<td>15.8</td>
<td>13.7</td>
<td>-</td>
<td>35.4</td>
<td>9.1</td>
<td>9.3</td>
<td>23.4</td>
<td>18.6</td>
</tr>
<tr>
<td>1750-</td>
<td>13.9</td>
<td>24.4</td>
<td>17.9</td>
<td>2.3</td>
<td>12.1</td>
<td>10.2</td>
<td>33.2</td>
<td>4.3</td>
<td>13.4</td>
</tr>
<tr>
<td>1800-</td>
<td>6</td>
<td>22.2</td>
<td>17.5</td>
<td>0</td>
<td>16.9</td>
<td>12.9</td>
<td>4.6</td>
<td>3.8</td>
<td>44.6</td>
</tr>
<tr>
<td>1850-</td>
<td>5.6</td>
<td>32.4</td>
<td>7.2</td>
<td>6.9</td>
<td>21.2</td>
<td>15.3</td>
<td>4.4</td>
<td>28.8</td>
<td>61.7</td>
</tr>
<tr>
<td>1900-</td>
<td>2.8</td>
<td>50.8</td>
<td>0</td>
<td>9.1</td>
<td>37.4</td>
<td>4.5</td>
<td>17.6</td>
<td>9.6</td>
<td>9.2</td>
</tr>
<tr>
<td>1950-</td>
<td>3</td>
<td>11.2</td>
<td>21.6</td>
<td>3.8</td>
<td>11</td>
<td>2</td>
<td>13</td>
<td>10.4</td>
<td>28.5</td>
</tr>
</tbody>
</table>

Table 10 Distribution of new types in \textit{ity} per 100 000 words across registers in ARCHEX

<table>
<thead>
<tr>
<th></th>
<th>Drama</th>
<th>Fict</th>
<th>Journ</th>
<th>Legal</th>
<th>Letter</th>
<th>News</th>
<th>Scienc</th>
<th>Medic</th>
<th>Serm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>18.5</td>
<td>19.3</td>
<td>9.1</td>
<td>-</td>
<td>14.8</td>
<td>4.1</td>
<td>52.8</td>
<td>49</td>
<td>17.7</td>
</tr>
<tr>
<td>1700-</td>
<td>4.1</td>
<td>27.2</td>
<td>9.2</td>
<td>-</td>
<td>14.2</td>
<td>4.6</td>
<td>18.5</td>
<td>11.7</td>
<td>9.3</td>
</tr>
<tr>
<td>1750-</td>
<td>7.5</td>
<td>18.8</td>
<td>9</td>
<td>16.1</td>
<td>20.2</td>
<td>12.3</td>
<td>9.5</td>
<td>14.3</td>
<td>0</td>
</tr>
<tr>
<td>1800-</td>
<td>0</td>
<td>10.3</td>
<td>17.5</td>
<td>5.9</td>
<td>34.3</td>
<td>8.6</td>
<td>27.9</td>
<td>18.9</td>
<td>17.8</td>
</tr>
<tr>
<td>1850-</td>
<td>0</td>
<td>14.5</td>
<td>14.3</td>
<td>3.4</td>
<td>3.2</td>
<td>6.5</td>
<td>13.3</td>
<td>18.3</td>
<td>17.8</td>
</tr>
<tr>
<td>1900-</td>
<td>7.7</td>
<td>6.1</td>
<td>0</td>
<td>13.7</td>
<td>7.5</td>
<td>13.4</td>
<td>8.8</td>
<td>33.6</td>
<td>9.2</td>
</tr>
<tr>
<td>1950-</td>
<td>1.5</td>
<td>4.7</td>
<td>0</td>
<td>26.8</td>
<td>7.3</td>
<td>7.8</td>
<td>77.5</td>
<td>72.8</td>
<td>38</td>
</tr>
</tbody>
</table>

It is very difficult to extract information or observe patterns on the basis of Tables 9 and 10. In Table 12 and 13, therefore, I rank the registers according to the number of new types contributed by that register. Before moving on to this more useful form of comparison, we should briefly make a note of the numbers of new types which occur in more than one register, and are thus not reflected in Tables 9 and 10. Table 11 reflects the proportion of new types common to more than one register of the total new types for each period. These proportions have some bearing on the results obtained in section 4, in that new types common to more than one register are less likely to be new in the language.

Table 11 Percentage of the new types in \textit{ness} and \textit{ity} appearing in more than one register

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>\textit{ness}</td>
<td>18.2%</td>
<td>10.3%</td>
<td>10.9%</td>
<td>9.1%</td>
<td>16.2%</td>
<td>4.5%</td>
<td>11.1%</td>
</tr>
<tr>
<td>\textit{ity}</td>
<td>10.8%</td>
<td>21.2%</td>
<td>26.2%</td>
<td>27.9%</td>
<td>14.3%</td>
<td>4.3%</td>
<td>8.8%</td>
</tr>
</tbody>
</table>

The comparatively high percentage of 18.2 (almost twice the figure for the other periods) obtained for \textit{ness} in 1650-1700 somewhat lessens the impact of the difference observed between \textit{ness} and \textit{ity} for that period. It may be that the starting lexicon did not
adequately capture existing types in -ness. The 16.2% obtained for 1850-1900 also mitigates the increase in -ness observed for the last half of the nineteenth century. The three highest percentages for -ity occur in the three periods with the highest numbers of new types in -ity (see Table 5). The number of new types in -ity for these periods may in reality be even closer to the number of new types for -ness than is reflected in Figure 2.

In Tables 12 and 13 the registers are ranked for each period from highest to lowest according to the number of new types contributed by that register:

Table 12 Ranking of registers according to normalised new types in -ness for ARCHER

<table>
<thead>
<tr>
<th>Period</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>Sermon</td>
<td>Fiction</td>
<td>Science</td>
<td>Medical</td>
<td>Letters</td>
<td>Drama</td>
<td>News</td>
<td>Journals</td>
<td>-</td>
</tr>
<tr>
<td>1700-</td>
<td>Letters</td>
<td>Medical</td>
<td>Sermon</td>
<td>Fiction</td>
<td>Journal</td>
<td>Science</td>
<td>News</td>
<td>Drama</td>
<td>-</td>
</tr>
<tr>
<td>1750-</td>
<td>Science</td>
<td>Fiction</td>
<td>Journals</td>
<td>Drama</td>
<td>Sermon</td>
<td>Letters</td>
<td>News</td>
<td>Medical</td>
<td>Legal</td>
</tr>
<tr>
<td>1800-</td>
<td>Sermon</td>
<td>Fiction</td>
<td>Journals</td>
<td>Letters</td>
<td>News</td>
<td>Drama</td>
<td>Science</td>
<td>Medical</td>
<td>Legal</td>
</tr>
<tr>
<td>1850-</td>
<td>Sermon</td>
<td>Fiction</td>
<td>Medical</td>
<td>Letters</td>
<td>News</td>
<td>Journals</td>
<td>Legal</td>
<td>Drama</td>
<td>Science</td>
</tr>
<tr>
<td>1900-</td>
<td>Fiction</td>
<td>Letters</td>
<td>Science</td>
<td>Medical</td>
<td>Sermon</td>
<td>Legal</td>
<td>News</td>
<td>Drama</td>
<td>Journals</td>
</tr>
<tr>
<td>1950-</td>
<td>Sermon</td>
<td>Journals</td>
<td>Science</td>
<td>Fiction</td>
<td>Letters</td>
<td>Medical</td>
<td>Legal</td>
<td>Drama</td>
<td>News</td>
</tr>
</tbody>
</table>

Table 13 Ranking of registers in ARCHER according to number of new types in -ity

<table>
<thead>
<tr>
<th>Period</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-</td>
<td>Science</td>
<td>Medical</td>
<td>Fiction</td>
<td>Drama</td>
<td>Sermon</td>
<td>Letters</td>
<td>Journals</td>
<td>News</td>
<td>-</td>
</tr>
<tr>
<td>1700-</td>
<td>Fiction</td>
<td>Science</td>
<td>Letters</td>
<td>Medical</td>
<td>Sermon</td>
<td>Journals</td>
<td>News</td>
<td>Drama</td>
<td>-</td>
</tr>
<tr>
<td>1750-</td>
<td>Letters</td>
<td>Fiction</td>
<td>Legal</td>
<td>Medical</td>
<td>Sermon</td>
<td>Journals</td>
<td>Fiction</td>
<td>News</td>
<td>Legal</td>
</tr>
<tr>
<td>1800-</td>
<td>Letters</td>
<td>Science</td>
<td>Medical</td>
<td>Sermon</td>
<td>Journals</td>
<td>Science</td>
<td>News</td>
<td>Legal</td>
<td>Drama</td>
</tr>
<tr>
<td>1850-</td>
<td>Medical</td>
<td>Sermon</td>
<td>Fiction</td>
<td>Journals</td>
<td>Science</td>
<td>News</td>
<td>Legal</td>
<td>Letters</td>
<td>Drama</td>
</tr>
<tr>
<td>1900-</td>
<td>Medical</td>
<td>Legal</td>
<td>News</td>
<td>Sermon</td>
<td>Science</td>
<td>Drama</td>
<td>Letters</td>
<td>Fiction</td>
<td>Journals</td>
</tr>
<tr>
<td>1950-</td>
<td>Science</td>
<td>Medical</td>
<td>Sermon</td>
<td>Medical</td>
<td>News</td>
<td>Letters</td>
<td>Fiction</td>
<td>Drama</td>
<td>Journals</td>
</tr>
</tbody>
</table>
It is immediately obvious that it is not as clear in the case of \textit{ness} and \textit{ity} as it is for 
\textit{(t)ion} which registers are consistently the most productive and which are the least. The 
ranking can be crudely averaged over time by according a score for each rank, and 
summing the scores for each register. The register with the lowest score has the highest 
number of new types. The overall ranking for \textit{ness} is as follows: sermons (17) / fiction 
(17); letters (27), science (32); medical (35); journals (36); news (47); drama (48).

This measure is crude because it does not allow for the observation of changes in 
the positioning of the registers with regard to new types in \textit{ness} over time. The 
numerical values (the normalised new types) for table 9 can only be compared within a 
period. Ideally changes could be observed in the ranking in Table 12, but for \textit{ness} there 
are no obvious diachronic patterns in the ranking. In section 7 I comment more 
extensively on the changes in the performance of \textit{ness} over time for individual registers.

The crude overall scores for the ranking of \textit{ity} based on Table 13 are as follows: 
medical (17); science (22); fiction (27); sermons (32) / letters (32); news (41); journals 
(47); drama (52). Starting from the bottom, journals and drama again seem to have the 
lowest number of new types. We can thus conclude that these registers have little 
dejectival nominalization generally. Fiction, sermons and letters now occupy the 
middle ranks. These registers may make extensive use of dejectival nominalization 
generally, but with a preference for \textit{ness}. Scientific and medical writing show the 
highest number of new types in \textit{ity}. These registers may similarly make extensive use of 
dejectival nominalization generally, but with a preference for \textit{ity}. For \textit{ity} too, it is not 
possible to observe diachronic patterns in the ranking, although it may be worth pointing 
out the performance of Letters in the late eighteenth century and early nineteenth century,
when this register is ranked highest, and also that medicine and science are most dominant in the seventeenth century and again in the twentieth century.

The extensive use of -ity by the scientific and medical registers might be associated with the shift to the informational end of the informational/involved dimension identified for these registers in ARCHER by Biber and Finegan (1997). On the other hand, it may simply be that more informational registers have a greater Latinate element, given the extensive use of -(t)ion in scientific and medical prose. The extensive use of -ness in fiction and letters might be associated with the shift to the involved end of the dimension by these registers. However, sermons, which demonstrate the greatest numbers of new types in -ness, have not been identified as becoming more involved.

7. Textual analysis: deadjectival nominalization in discourse

One of the major discourse functions of nominalization which emerged in the discussion of the discourse functions of action nominalization in chapter 4 was cohesion. This process allows previously given information to be referred to later in the text in the form of a nominalization. The practical advantages of cohesion are primarily economical, but in the process of creating a noun, that newly named concept is frequently reified and accorded a status in the theory, or place in the schema that is the subject of the text. Finally, it was noted that action nominalization could lose functionality and become a marker of style.

The discourse functions of deadjectival nominalization to a large extent overlap with those of deverbal nominalization. The illustration of the Halliday and Martin model of nominalization in discourse presented in chapter 4 included the deadjectival
nominalizations *indistinctness* and *convexity*, which corresponded to adjectives in the NPs “confused picture” and “convex glasses”, and *plumpness*, which corresponded to the adjectival complement in “grow flatter”. Deadjectival nominalizations can thus also be used for cohesion, to re-present information previously given (usually) as an adjective in an NP. In this way they can act as an economizing strategy for the writer. However, the semantic implications of these derivations differ slightly from their deverbal counterparts. Deadjectival nominalizations belong to the set of “abstract nouns” in English insofar as they denote qualities, either attributed to individuals or described independently. Used attributively, deadjectival nominalizations are typically descriptive, and therefore unlikely to occur in narrative discourse. In this mode, they may be purely cohesive or they may perform the role of identifying the essential and timeless qualities or properties of the subject. When deadjectival nominalizations are used independently of a subject, they are more likely to occur in ideologically motivated discourse, i.e. persuasive or rhetorical texts. As support for these suggestions I offer the textual analyses below.

I will discuss deadjectival nominalization in the following registers of ARCHER: scientific and medical writing, sermons and fiction, the four highest-performing registers for –ness and –ity. There are some registers that have been set aside on the basis of their low performance for –ness and –ity. These are drama, news, journals and legal documents. Letters have been excluded from textual analysis for reasons of space, although ideally this register should be included given its strong performance for both affixes. The approach taken here will be to target texts from those cells which were ranked highest in Tables 12 and 13 for –ness and/or –ity. I discuss scientific and medical
writing first in order to establish important points about the relationship between deadjectival nominalizations and Early Modern style.

7.1. Scientific and medical writing

For this register, the number of new deadjectival nominalizations contributed by \(-ness\) and \(-ity\) together, is greater in the first and last periods, and possibly also 1750-1800. This provides some, although it must again be emphasized not wholly accurate, idea of the extent of the use of abstract nouns more generally. Second to medical writing, scientific writing showed the highest numbers of new types in \(-ity\) averaged over the entire corpus. The new types for 1650-1700, 1950-1990 (ranked highest for \(-ity\)) and 1750-1800 (ranked highest scores for \(-ness\)) are shown in Table 14:

<table>
<thead>
<tr>
<th>Period</th>
<th>(-ness)</th>
<th>(-ity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-1700</td>
<td>accurateness, badness, closeness, hilliness,</td>
<td>acidity, credibility, disparity, impetuosity,</td>
</tr>
<tr>
<td></td>
<td>keenness, muddiness, narrowness, usefulness</td>
<td>inequality, propensity, proximity, velocity,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>veracity, volatility, vulgarities</td>
</tr>
<tr>
<td>1750-1800</td>
<td>fitness, grasiness, healthiness, laxness,</td>
<td>fixity, torpidity</td>
</tr>
<tr>
<td></td>
<td>minuteness, offensiveness, ruggedness</td>
<td></td>
</tr>
<tr>
<td>1950-1990</td>
<td>brittleness, discreteness, relatedness</td>
<td>capillarity, compatibility, compressability,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>crossability, discontinuities, incompatibility,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>insusceptibility, linearity, molecularity,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>orthogonality, permeability, porosity,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proportionality, rhythmicity, seismicity,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specificity, toxicity, vorticity</td>
</tr>
</tbody>
</table>

The following analyses will investigate the nature of the textual environments which prompted these derivations. Some of the basic functions of deadjectival nominalizations in scientific writing can easily be demonstrated from a short excerpt as early as 1675:

1675 B.R. Of the Incalence of Quicksilver with Gold. Philosophical Transactions 10, p122

For notwithstanding the vulgarly supposed
Similar nature of Quicksilver, which I willingly confess to be
great enough to be admirable, it was yet congruous to my Principles, that a Liquor, which in weight, colour, total volatility, &c. was answerable to all the essential Properties for which a body is called mercury, might yet have an internal constitution of parts, that might make it in some unobserved things considerably differing from common Mercury. And among these differing Qualities I did not know but one might well be, that of growing hot with Gold.

What is immediately apparent is the way that deadjectival nominalizations are used in scientific writing to name the properties of substances. Volatility (line 5) is a member of a list of (mostly) measurable properties by which one substance can be distinguished from or compared to another (quicksilver and mercury in this case). The as yet under-researched property in this article is still expressed periphrastically: “that of growing hot with gold” (line 10).

The prevalence of abstract nouns in scientific writing can be established from the early seventeenth century. Despite Francis Bacon’s emphasis on “things”, few of his words refer to solid physical objects (Adolph 1968:72). The following passage is typical of Bacon’s abstract vocabulary:

To enquire the Form of a lion, of an oak, of gold, nay of water, of air, is a vain pursuit: but to enquire the Forms of sense, of voluntary motion, of vegetation, of colours, of gravity and levity, of density, of tenuity, of heat, of cold, and all other natures and qualities, which like an alphabet are not many, and of which the essences (upheld by matter) of all creatures do consist; to enquire I say the true forms of these, is that part of Metaphysic which we now define of. (Advancement of Learning, pp. 220-221, quoted in Adolph 1968:52)

Thus Bacon’s concern is not only to identify the properties of substances under observation, but these qualities or properties can actually form the research question. There is considerable debate about the continuity of seventeenth century prose, but it seems that, despite the precise argumentation of Restoration prose, and its more systematic arrangements of abstract nouns, abstract nouns were still treated in the
Restoration as though they were the only kind (Adolph 1968:222). Definitions are crucial in the new plain style of the Restoration, but these definitions tend to depend on other, undefined abstract nouns. The method of definitions makes abstract nouns seem like things, and readers are flattered by the assumption that they know the “things” which fashionable words stand for, whereas nothing is in fact very clearly shown (Adolph 1968:223-224).

Abstract nouns feature prominently in debates about style in the seventeenth century, when natural philosophy was beginning to develop into the natural science, or sciences which we know today. Their use forms part of a broader concern with the introduction of new terminology. This discussion must be restricted however to the implications of these debates for the borrowing and coining of deadjectival nominalizations in –ness and –ity. It is interesting that the list of terms given in the Bacon excerpt above include several items in –ity and none in –ness. In the B.R. passage, volatility was chosen over volatileness. The data suggests that this period favours –ity, but not overwhelmingly. Individual expressions of the variability appear to have been quite diverse.

Boyle’s Experiments with the air-pump (1660) uses fluidness and fluidity in the same text: “colours, odours, tastes, fluidness and solidity, and those other qualities that diversify and denominate bodies”, and later, “even such obvious and more familiar phaenomena as fluidity and firmness, the colours and figures of stones, minerals, and other compound bodies”. It is interesting to compare representative texts from the period (Vickers 1987) in terms of their use of –ness and –ity. The ratio of types in -ness to types in -ity in Henry Power’s Microscopical Observations (1664) is 5:29, whereas Boyle’s
The Sceptical Chymist (1661) is 19:25, and Robert Hooke’s Micrographia (1665) is 35:37. Some of Power’s excesses include rugosities and asperities (glossed by Vickers respectively as “roughness” and “uneveness”), used in his observations on the common fly: “The other four legs are cloven and arm’d with little clea’s or tallons (like a Catamount) by which she lays hold on the rugosities and asperities of all bodies she walks over”.

Returning to Boyle’s Experiments with the air-pump, it is additionally interesting that fluidness and fluidity are paired with antonymous deadjectival nominalizations in the alternate affix: solidity with fluidness and firmness with fluidity. Hooke’s Micrographia, with its even numbers of –ness and –ity types shows many word pairs, the members of which are bolded in the passage below:

And could we so easily and certainly discover the Schematism and Texture even of these films, and of several other bodies as we can those of Cork; there seems to be no probable reason to the contrary but that we might as readily render the true reason of all their Phaenomena; as namely, what were the cause of the springiness and toughness of some, both as to their flexibility and restitution, What of the friability or brittleness of some others, and the like. But till such time as our Microscope or some other means enable us to discover the true Schematism and Texture of all kinds of bodies, we must grope, as it were, in the dark, and onely guess at the true reasons of things by similitudes and comparisons. (Hooke, Micrographia 1665)

Most of these pairs are synonymous or metonymic rather than antonymous. One pair, springiness and toughness, contains two items in –ness, and another, friability or brittleness, is a minimal pair with bases which are not etymologically related. The other pairs all consist of two loanwords or derivations on Latinate bases. Hooke’s pairing is thus a more extensive phenomenon than the representation of synonymys in –ness and –ity. All of the items in these pairs, with the exception of “similitudes and comparisons”, refer
to general properties which must be specifically determined for the substance under investigation.

Earlier it was noted that word pairs or doublets are one of a number of symmetrical balanced structures which are typical of Renaissance rhetoric (Rissanen 1975:257). From the texts quoted above, it appears that this device was still employed in the later half of the seventeenth century. The use of rhetorical word pairs in late seventeenth century science may prompt the use of derivations in both suffixes, in which case the motivation for neologisms created in such contexts is stylistic. Alternatively, word pairs may be functioning as a means of introducing a Latinate loanword, coining or derivation while rendering the meaning explicit. Or, in the case of \textit{ness} and \textit{ity} pairs, the device may simply be a means of catering for uncertainty over the selection of an suffix. This leads to the following set of questions: Until what time was it appropriate to use multiple terms for the same phenomenon, particularly native and Latinate synonyms, independently, or in the form of these word pairs? When the practice is discontinued, and only one term is selected for use, are native or Latinate derivations more likely to be selected, or does this differ for different periods?

Phenomena associated with deadjectival nominalizations are subject to censure by the “plain style” movement associated with the Royal Society\textsuperscript{11} in the 1660s, outlined so famously by Thomas Sprat in his \textit{History of the Royal Society} (1667). Sprat describes a “constant Resolution to reject all the amplifications, digressions and swellings of style: to return back to the primitive purity and shortness, when men delivered so many things in

\textsuperscript{11} Although Sprat and others were clearly influenced by Bacon who in 1620 called for the dismissal of “ornaments of speech, similitudes, treasury of eloquence and such like emptiness” (Adolph 1968; Vickers 1987:2).
an equal number of words”. According to Sprat, the Royal Society exacted from its members “a close, naked, natural way of speaking; positive expressions; clear senses; a native easiness”. Sprat was thus discouraging the use of:

(i) more than one word for one item or concept. This is particularly relevant to abstract nouns. Locke speaks of the “great deal of confusion which comes from several persons applying the same name to a collection of smaller or greater number of sensible qualities” (Locke in Adolph 1968:233). Such nominalism found its strongest expression in Wilkins’ proposal for a universal language. Wilkins also recommends “certain invariable Rules for all such Grammatical Derivations and Inflexions” (Wilkins 1668; Gotti 1992:340).

(ii) Latinate loanwords, Latinate coining and derivation in Latinate affixes. Sprat’s History was praised by Joseph Glanvill for not being “broken with ends of Latin” or “made harsh by hard words” (cited in Adolph 1968:90). Possibly Sprat would have favoured derivations in the native suffix –ness.

(iii) the rhetorical device of word pairs, which are associated with (i) when they contain synonyms, and associated with (ii) when they contain native and Latinate pairs, or exclusively Latinate pairs.

The injunction against Latinate vocabulary was however heavily contested. The English language was regarded as inadequate for scientific purposes because of its limited
vocabulary (Gotti 1992:324). Scientists accused in the mid-seventeenth century by Royal Academy language reformers of excessive Latinate neologizing countered that English did not have equivalents for the “hard words” and technical terms of the sciences (Vickers 1987:19). Gotti explains that existing scientific terminology was Latin and the common practice of translators was to borrow the Latin term in the absence of an English word (1992:327-328). An advantage of using a little known term that had no “everyday” meaning was the possibility of associating that term with an explicit scientific definition. Furthermore, Latin and Greek were considered “dead languages whose lexical items were not likely to take on different shades of meanings and connotations, unlike living words” (Gotti 1992:343).

There has been much discussion of the divergence between the prescriptions of the “new” plain style and actual practice (Vickers 1987:21, Adolph 1968). Vickers claims that seventeenth century writers had still not reached “this ‘degree zero’ of writing, this absence of style” and that in their work we still find “a fluent use of metaphor, a fresh, at times child-like excitement at the ‘new visible World’ revealed by the microscope” (Vickers 1987:21). The consequences for terminology however are less clear. For instance, what was the effect of the plain on creative or poetic word-formation? Power (1664) speaks of a fly being able to “be-glew herself to the plain she walks on”. Then again Power may be the antithesis of the plain style, given that he is also the author of the Latinate extremes cited above (although be-glew is created through a native word-formation process). One of the features which may distinguish the scientific style from the dominant manner of writing in the Puritan regime in the middle of the century, in
addition to metaphors and similes, long sentences, Latin and Greek quotations, exotic words and many Latinisms is “poetic phraseology” (Jones in Adolph 1968).

The comprehensive description of the plain style, if indeed it exists, is a complex exercise which cannot be undertaken here. I am specifically concerned with the implications of seventeenth century prescriptivism for deadjectival nominalizations in -ness and -ity in scientific writing. In ARCHER, the number of new types –ness as opposed to –ity is notable only in the 1750-1800 period, almost a century later than the recommendations for plain style, although the attitudes of the eighteenth century reviewers to Latinate items occasionally did not apply to science:

If we have solidity and fluidity, why not vaporosity? The question is mooted by The Monthly Review in 1788. Actually the word had been used in the sixteenth century and was to be used in the early nineteenth – but the eighteenth thought it had no authenticity. But the Review rightly concluded that if science wanted it, it must be used (Tucker 1967: 13).

The deadjectival nominalizations used to describe properties in Garden, below, are in -ness. I refer to thinness and laxness (line 3):


This carina, or heel, is very distinguishable from the other two divisions, by its thinness, its apparent laxness, and by the reticulated skin of a more grey and light colour, with which it is covered. When the animal swims gently in pretty deep water, the rhomboidal reticulations of the skin of this carina are very discernible

In the next text, Bruce, greasiness (line 4) is a property by which one can identify freshly-gathered myrrh:

1775 Bruce, James. Some observations upon Myrrh ...
Philosophical Transactions 65:408-

It may be remarked, that when we buy fresh or new myrrh, it has always a very strong, rancid, oily smell; and when thrown into water, globules of an oily matter swim upon the surface. This
greasiness is not from the myrrh; it is owing to the savages using goat-skins anointed with butter (to make them supple) wherein to put their myrrh at gathering; and in these skins it remains, and is brought to market: so that, far from its being a fault, as some ignorant druggists at Rome and Venice believe, it is a mark that the myrrh is fresh gathered, which is the best quality that myrrh of the first sort can have.

Interestingly, greasiness is not a universal property which can be measured for any substance. The use of the word here is for the purpose of cohesion. The reader is informed that myrrh has an “oily smell” and contains “oily matter”. The term greasiness (note preceded by demonstrative this) captures and refers back to these phenomena. It emerges that greasiness is not inherently a property of myrrh, but due to the way in which myrrh is stored. This type of example suggests that even though the number of new types in –ness is greater in this period, few of these types have a specialised scientific meaning in the way that –ity types do. We can find a similar example in the Nooth excerpt below:

1775 Nooth, John Mervin. The description of an apparatus for impregnating water with fixed air. Philosophical Transactions 65, p59

The bladder, which formed part of it, was thought to render the water offensive; and when the solvent power of fixed air is considered, it will not appear improbable, that the water would be always more or less tainted by the bladder. In some trials which I made with Dr. Priestley's apparatus, it always happened, that the water acquired an urinous flavor; and this taste in the water was, in general, so predominant that it could not be swallowed, without some degree of reluctance. The difficulty, therefore, in the conduct of the process, and the offensiveness of part of the apparatus, made some less exceptionable method of producing the impregnation desirable. This I variously attempted, keeping convenience and cleanliness constantly in view; and I flatter myself, that I have at last contrived an apparatus that will perfectly answer the intended purpose.

Offensiveness (line 9) is cohesive to the adjectival complement (underlined) in line 2. The offensiveness is not an inherent property of the water. This is actually a narrative passage in which Nooth relates, in the past tense, his trials with Dr Priestley’s apparatus. In the
sentence in which the nominalization appears, it is in the first position in the clause, compounded with another NP — "the conduct of the process". Together these two factors prompt the next stage in the process: the means of overcoming the offensiveness.

By 1800 the number of types in –ness has decreased in scientific writing and –ity is dominant once more. Ultimately, in technical writing, unlike in other registers, the use of –ness decreases. By the twentieth century the use of –ness is very limited. The transparency of words ending in –ness permits only the indication of the state or property associated with the adjective, and the suffix loses its association with specialised concepts. And as scientific writing relies less on the inventiveness of the writer for the descriptive function, the utility of –ness for this purpose is also lost. It is this very feature, however, that may guarantee its intensive use in other styles.

Derivations in –ity tended to be retained with a specialized meaning, frequently at the expense of originally interchangeable items in –ness. This results in –ity then becoming associated with specialized terminology. Bacon’s famous complaint in the Novum Organum that a word such as “humid” is a “vague abstraction” which cannot be reduced to any constant meaning12 could be extended to the lexical field of moisture, moistness, wateryness and humidity. Humidity is the specialised scientific term that is retained from that set. A Latinate term is not necessarily coined or borrowed with a specialized meaning. Specialization often takes place in relation to other early terms, for instance, gravity and velocity developed specialised meanings as opposed to heaviness and rapidness. Gravity takes on a specialised meaning as a consequence of Newton’s use of the word in his important innovations in the field of physics (Gotti 1992:327).

Later nineteenth or twentieth century terms in \textit{ity} however, tend to be borrowed or coined with a specialized meaning. Modern English deadjectival nominalizations in science are Latinate and frequently end in \textit{ity}, modelled perhaps on the earlier versions. This development may be related to the increased diversification of natural science into different disciplines that begins to take place in the nineteenth century. According to Atkinson, "discrete scientific disciplines initially developed in Britain in direct opposition to the eclectic, 'amateur', and essentially unified version of science which dominated the Royal Society at the beginning of the nineteenth century" (1996:364-365). Some may explain the considerable number of new types in \textit{ity} in 1950-1990 by appealing to structural restrictions, but I would argue that it is significant that the bases of these derivations are Latinate. Take for example Crapper, below:


The undisturbed situation which we consider is that of a two dimensional jet of liquid, density PL, surrounded by gas of density PG. The \textit{thickness} of the jet is 2h and its \textit{velocity} is UL assumed constant across the \textit{thickness} since \textit{viscosity} is to be neglected. The air is at rest. ...

The mechanism of vortex formation is very clear from our high speed cine films, and is best illustrated in the previously published photographs. The time scale is much too short for the \textit{vorticity} to diffuse outwards from the sheet surface, and the vortices are formed by being cast off from the wave crests just as if the wave were a solid cylinder, when the amplitude has grown sufficiently to give the appropriate Reynolds number.

All the properties mentioned in the first paragraph are measurable. The only one in \textit{ness} is \textit{thickness}, which has a general meaning in other registers and a specialized meaning here. The other measurable properties are \textit{ity} words: \textit{density}, \textit{velocity} and \textit{viscosity}, which have first citations in the OED as 1603, 1550 and 1425 respectively. None of
these -ity derivations are therefore new, but they are the expressions that have been retained. Vorticity on the other hand is a Modern English Latinate coining (1888) that may have been prompted by the extensive presence of -ity loanwords and derivations in scientific prose.

Similar developments to scientific prose have taken place in medical writing with regard to -ness and -ity, if indeed a distinction can be drawn between the two registers, especially in theoretical articles. For example, one of the -ness types in 1750-1800 is saltiness (line 8 in Houlton), used with a sense which in later periods is conveyed by salinity:

1775 Houlton, ---. Observations on mineral poisons. Medical and Philosophical Commentaries, vol. III.

After each vomiting, a dose of this solution of salt of tartar, should be given, and it may be repeated every two or three hours, especially if the pain of the stomach returns. It should be continued too in small doses for some time after the symptoms disappear. If none of the salts are at hand, a little wood-ashed mixed with boiling water will answer the same end, suffering them to stand till they settle, and pouring the water clear off. By tasting it, the degree of saltiness will determine if the solution be strong enough, if it be not disagreeably so it may be given.

10

More accurately, salinity presupposes “degree of”, which is used together with saltiness here. Qualities or properties in medicine are often used to describe symptoms, which, when applied to the patient, can be very generalized. These symptoms are often expressed by derivations in -ness. There is a common set of them, consisting of items such as dizziness, uneasiness, soreness, or faintness, used by Gibson, below, in line 3:


Case 2 -- A jeweller, age 68, has been seen two or three times
along with Dr. George Mackay. He has for some time complained of frequent attacks of faintness and has more than once been attacked by serious vertigo, as the result of which he has actually fallen in the street. The patient is a man of ruddy complexion and healthy aspect. The arteries are rigid and tortuous, showing turgidity and high pressure. The pressure of the pulse is 150 mm. Hg; the rate is 34 per minute.

In contrast, -ity derivations tend to have specialized meanings, such as turgidity (line 6), which is a property of the arteries in the patient’s current state, as is high pressure.

Pathogenicity, of line 6 in Lewis and Turner, below, is a more complex example.


The organism or organisms regarded as predominant in individual cases -- Though in the wealth of organisms associated in these cases, and possibly pathogenic, it could not be certainly stated which was the <fons et origo mali>, yet in some of the cases we were enabled to conjecture which organism was most probably responsible. This we did on consideration (i) of the pathogenicity of the organisms (as ascertained by experiment on animals), and (2) of the organisms in direct swab as compared with nasal swab from the same case, and (3) of the persistence in chronic cases of particular varieties, and (4) of the occurrence in pure culture of one organism. In this way we are able, though with some diffidence, to assign the principal role to the pneumococcus in fourteen, to the Streptococcus pyogenes in nineteen, and to the staphylococcus in six of the fifty-seven cavities.

Pathogenicity is one the first of a list of items followed by persistence and occurrence. These are all properties of bacteria that can be measured, although they may be nominal rather than interval variables. It is unsurprising that pathogenicity is coined on a Latinate pattern. The first citation in the OED is 1876. The derivation also provides cohesion in this article, referring back to the adjective pathogenic in line 3. The three properties structure the investigation - they are the research questions of the article.
7.2. Sermons

Averaged over the entire ARCHER corpus, sermons produced the most new types for -ness, but new types produced for -ity are typically much lower. In 1650-1700, 1800-1850, 1850-1900 and 1950-1990, sermons were ranked highest for -ness. Sermons do not contribute many of the new types in -ity, although in 1850-1900 and 1950-1990 sermons are ranked second and third respectively for -ity. It may be noteworthy that greater numbers of new types in -ity occur only in Modern English. Below I give the new types for selected periods:

Table 15 new types for -ness and -ity in selected periods of sermons for ARCHER

<table>
<thead>
<tr>
<th>Period</th>
<th>-ness</th>
<th>-ity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650-1700</td>
<td>foolhardiness, gracefulness, lewdness, liveliness, reasonableness, stiffness, thankfulness, wilfulness</td>
<td>christianity, ferity</td>
</tr>
<tr>
<td>1800-1850</td>
<td>affectionateness, greenness, opinionativeness, saintliness, solitariness</td>
<td>parity, unpopularity</td>
</tr>
<tr>
<td>1850-1900</td>
<td>brazenness, commonness, genuineness, fearfulness, feeble-mindedness, guilelessness, hopelessness, illusiveness, mysteriousness, tastelessness, trustworthiness, unpersuasiveness, unselfishness</td>
<td>availability, informity, instrumentality, sentimentality, vitality</td>
</tr>
<tr>
<td>1950-1990</td>
<td>distinctiveness, godlessness, pervasiveness, self-righteousness, sinlessness, transitoriness</td>
<td>catholicity, irrationality, mentality, profundity, relativity, spirituality, superficiality, unreality</td>
</tr>
</tbody>
</table>

Looking at the items in -ness in this table, we can see that the suffix occurs on a number of bases that could, according to identified structural restrictions, be expected to take -ity. These include an adjectival base in -able (reasonableness) which occurs in 1650-1700, and 5 adjectival bases in -ive (opinionativeness, illusiveness, unpersuasiveness, distinctiveness and pervasiveness) which are distributed across the periods.

Affectionateness, which I earlier suggested occurs with the meaning of affection, is a product of the 1800-1850 period. Of the bases which occur with -ity, only one is in -ive
(relativity), another is in -able (availability), one is -ar (unpopularity), one is -ic (Catholicity) and eight are in -al. The remainder (christianity, ferity, parity, informity, profundity) all have first citations in the OED before 1650.

Medieval and Early Modern religious discourse has been pinpointed as the source of many borrowed abstract nouns in -ity (Riddle 1985) and, along with philosophy (frequently theological) the source of many borrowed bases for -ness (Romaine 1985). These writers have not however commented in detail on the manner in which abstract nouns are coined and/or deployed in religious discourse. A proliferation of deadjectival nominalizations referring to non-physical attributes of human beings, used independently or attributed to specific persons, is frequently associated with subjective moralising discourse, which intends to persuade rather than construct knowledge by appealing to objective evidence.

Rissanen, in a study of Hall, Elyot, and Ascham, found that the number of loanwords, or “inkhorne” terms, escalated in passages of “heightened rhetoric”, in which the author appeals to the reader – “often moralizing comments echoing pulpit oratory” - as opposed to anecdotal passages (1975: 258-259). Yet a century later, in sermons which appear in the ARCHER corpus, even passages of heightened rhetoric, the level of Latinate vocabulary is fairly low, partially indicated by the low numbers of new types in -ity. There is considerable debate about the influence of the plain style, or of contemporary scientific writing, on late seventeenth century sermons. Adolph claims that with the possible exception of Tillotson, none of the “four greatest preachers of the Restoration” (South, Barrow, Stillingsfleet and Tillotson) shows the influence of
“science” in general or of the Royal Society in particular (1968:199). Let us begin then, with a late seventeenth century text by Isaac Barrow\textsuperscript{13}, included in ARCHER.

Barrow, Isaac. Of Submission to the Divine Will.

To make good his right, God bendeth all his forces, and applieth all proper means both of \textit{sweetness} and \textit{severity} (persuading us by arguments, soliciting us by entreaties; alluring us by fair promises, scaring us by fierce menaces, indulging ample benefits to us, inflicting sore corrections on us, working in us and upon us by secret influences of grace, by visible dispensations of providence), yet so it is, that commonly nothing doth avail, our will opposing itself with invincible resolution and \textit{stiffness}.

Here indeed the business pincheth; herein as the chief worth, so the main difficulty of religious practice consisteth, in bending that iron sinew; in bringing our proud hearts to stoop, and our sturdy humours to buckle, so as to surrender and resign our wills to the just, the wise, the gracious will of our God, prescribing our duty, and assigning our lot unto us. We may accuse our nature, but it is our pleasure; we may pretend \textit{weakness}, but it is \textit{wilfulness}, which is the guilty cause of our misdemeanours; ... for that in him nature was most perfect, his complexion very delicate, his temper exquisitely sound and fine; for so we find, that by how much any man's constitution is more sound, by so much he hath a smarter gust of what is agreeable or offensive to nature. If perhaps sometimes \textit{infirmity} of body, or distemper of soul (a savage \textit{ferity}, a stupid \textit{dullness}, a \textit{fondness} of conceit, or \textit{stiffness} of humour, supported by wild opinions, or vain hopes) may keep men from being thus affected by sensible objects;

Some of the deadjectival nominalizations appear within the by now familiar structure of a word pair. These pairs are antonymous, as in “sweetness and severity” (line 2), or synonymous as in “resolution and stiffness” (line 9). The text has other instances of symmetry, for instance the compound sentence “we may pretend weakness, but it is wilfulness”. \textit{Weakness} and \textit{wilfulness} are not paired as words, but they appear in the same

\textsuperscript{13} Exact date uncertain.
position in balanced clauses, and this relationship is strengthened by the alliteration (lines 16-17). Barrow is as fond of copious listing as he is of pairing. The first instance of this, a parenthesis consisting of 7 participial phrases, begins in line 3 and ends in line 7. Moving down to line 23, there is a pairing of “infirmity of body” and “distemper of soul” as a compound subject, and then the latter receives four appositives in parentheses, all of them deadjectival nominalizations in –ness and –ity.

Other than the limited Latinate coining and borrowing in this passage, the style does not appear to have been affected by the prose of utility, or seventeenth century plain style. Adolph says of Barrow that “never ... has so sober a doctrine been enunciated with such grandeur.” Barrow’s “plain splendor” is created “through great piles of balanced, though not antithetical, phrases, usually in settled triplets” (1968:202-203). Barrow’s plentiful use of derivations in –ness (some titles of Barrow’s sermons include “The Profitableness of Godliness”, “The Fruitlessness of Sin”), frequently on native bases, ensures that his vocabulary is maximally transparent for a non-specialist audience. Given the persuasive purpose of the sermon, there is little need for the other characteristics of plain style, such as iconicity or economy.

Moving to a sermon from the period 1800-1850, Frederick Robertson sets out to identify certain essential qualities of Christ. The thematic quality is referred to as loneliness in the title, and as solitariness in line 3. Curiously, solitude is used in line 42, when that particular attribute is not the topic or focus of the sermon. The owner of this characteristic and its attendant qualities switches from Christ to John the Baptist, to the addressee, and finally to a young man or woman observed by the addressee. This is an
excellent illustration of how preachers typically describe the moral qualities of an exemplar and extend these to the common man or woman in the audience.

1849 Robertson, Frederick. The Loneliness of Christ.

There is no thought connected with the life of Christ more touching, none that seems so peculiarly to characterize His spirit, as the solitariness in which He lived. Those who understood Him best only understood Him half. Those who knew Him best scarcely could be said to know Him. On this occasion the disciples thought, Now we do understand, now we do believe. The lonely spirit answered, "Do ye now believe? Behold the hour cometh that ye shall be scattered, every man to his own, and shall leave me alone."

1. First, then, we meditate on the loneliness of Christ.

The loneliness of Christ was caused by the divine elevation of His character. His infinite superiority severed Him from sympathy; His exquisite affectionateness made that want of sympathy a keen trial.

There is a second-rate greatness which the world can comprehend. If we take two who are brought into direct contrast by Christ Himself, the one the type of human, the other that of divine excellence, the Son of Man and John the Baptist, this becomes clearly manifest. John's life had a certain rude, rugged goodness, on which was written, in characters which required no magnifying-glass to read, spiritual excellence. ... The world has small sympathy for divine goodness; but it also has little for a great many other qualities which are disagreeable to it. You meet with no response; you are passed by; find yourself unpopular; meet with little communion. Well! Is that because you are above in the world -- nobler, devising and executing grand plans, which they can not comprehend; vindicating the wronged; proclaiming and living on great principles; offending it by the saintliness of your purity, and the unworldliness of your aspirations? Then yours is the loneliness of Christ. ...

You may detect the approach of that moment in the young man or the young woman by the awakened spirit of inquiry; by a certain restlessmess of look, and an eager earnestness of tone; by the devouring study of all kinds of books; by the waning of your own influence, while the inquirer is asking the truth of the doctors and teachers in the vast temple of the world; by a certain opinionativeness, which is austere and disagreeable enough; but the austerest moment of the fruit's taste is that in which it is passing from greenness into ripeness. If you wait in patience, the sour will become sweet. Rightly looked at, that opinionativeness is more truly anguish; the fearful solitude of feeling the insecurity of all that is human; the discovery that life is real, and forms of social and religious existence hollow.
The differences between the plainer style of Robertson and the seventeenth century Barrow passage include shorter sentences, and a lack of symmetrical structures, apart from the clauses containing *superiority* and *affectionateness* (lines 12-13) which are similar in structure and balance each other. There are also no lists, except for the four consecutive participial phrases in 26-30. There is considerable use of the second person pronoun and even an interjection “well!” (line 26). Yet this sermon still has rhetorical aspects, such as the qualification of qualities, for example “infinite superiority” and “exquisite affectionateness” (lines 12-13). Further, there are attributes of attributes such as “sainthood of your purity” and “unworldliness of your aspirations” (lines 29-30). This kind of device may be responsible for many additional deadjectival nominalizations. It might be argued that *opinionativeness* simply coheres with “asking” (line 36), but the quality takes on a greater dimension than the re-statement of previously given information. It is a marker by which one can identify a divine or divinely inspired personality. From line 10 onwards, after the invocation to meditate, there are few narrated events with finite verbs, and the sermon can truly be said to have a nominal style.

Finally, the Drummond sermon below is an extreme version of the structure of the non-narrative passages of most sermons. Nine qualities (variously referred to by Drummond as “elements”, “virtues” and “ingredients”), the majority of them expressed by deadjectival nominalizations in *-ness* and *-ity*, are simply listed with explanatory quotations.


And in these few words we have what one might call the spectrum of love, the analysis of love. Will you observe what its elements are? Will you notice that they have common names; that they are virtues which we hear about every day, that they are things which can be practised by every man in
every place in life; and how, by a multitude of small things and ordinary virtues, the supreme thing, the summum bonum, is made up?

The spectrum of love has nine ingredients:
Patience -- "Love suffereth long."
Kindness -- "And is kind."
Generosity -- "Love envieth not."
Humility -- "Love vaunteth not itself, is not puffed up."
Courtesy -- "Doth not behave itself unseemly."
Unselfishness -- "Seeketh not her own."
Good temper -- "Is not easily provoked."
Guilelessness -- "Thinketh no evil."
Sincerity -- "Rejoiceth not in iniquity, but rejoiceth in the truth."

Patience, kindness, generosity, humility, courtesy, unselfishness, good temper, guilelessness, sincerity -- these make up the supreme gift, the stature of the perfect man.

Drummond is not exactly avoiding -ity derivations, given the presence of humility, sincerity and generosity. But the use of guilelessness (the only new type from this sermon) suggests that innovation takes place through native word-formation processes.

7.3. Fiction

Fiction is the most productive register for deadjectival nominalizations in -ness after sermons, and the most productive for -ity after medicine and science. The contrast between 1700-1750 and 1900-1950 is illustrated in Table 16. The number of -ness formations for the first half of the twentieth century is particularly remarkable in comparison to the number of -ity formations:
<table>
<thead>
<tr>
<th>Period</th>
<th>-ness</th>
<th>-ity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700-1750</td>
<td>agreeableness, capriciousness, consciousness, firmness, obsequiousness, politeness, willingness</td>
<td>Activity, barbarity, brutality, cupidity, disingenuity, festivity, gentility, lenity, malignity, sanctity, socity, timidity, vivacity</td>
</tr>
<tr>
<td>1900-1950</td>
<td>aloofness, askewness, blueness, childishness, chilliness, ghastliness, glossiness, greyness, intentness, maliciousness, meagreness, playfulness, priggishness, reddishness, reproachfulness, rosiness, rumminess, sameness, satyrishness, slackness, smugness, sombreness, thoughtlessness, unpleasantness, viciousness, vileness</td>
<td>adaptability, intractability, sensuality</td>
</tr>
</tbody>
</table>

The high numbers of deadjectival nominalizations in fiction generally, are, I would like to suggest, produced by descriptive passages, or, scene-setting. Fiction can make use of qualities for the purpose of characterization in the same way that sermons do, although not necessarily with the same intent to morally evaluate and persuade. Neologisms do not necessarily denote concepts that are intended to have permanent significance. They tend to be ephemeral, and are frequently coined for poetic effect. The preference for -ness shown by fiction may be for the same reasons as sermons: non-specialized audiences, and non-specialized meanings. Of the minimal pair density/denseness in section 5, it is interesting that the -ity derivation, density is retained in science. Denseness occurs in fiction, with a metaphorical meaning (applied to a person). The following texts are both taken from 1900-1950:


In ten seconds the floor rugs had sailed from their anchorages and were lying some neatly inside out and all in woeful askewness. The chairs left their military formation; some stood seat to seat like couples preparing for a dance, others in the woeful, slack isolation of those who stare after uncivil partners that have fled. And in this wreckage of a woman's room Conachur strode.
In this excerpt from Stephens which sets the scene for the arrival of Conachur, the floor rugs and chairs are personified. Furniture in an untidy room might conventionally be described with an adjective, "askew". The use of the --ness nominalization here, particularly with its qualifying adjective "woeful", suggests that the chairs have, human-like, entered into a human state, and in this way perpetuates the personification.

In lines 6-7 of the excerpt from Powys, below, the narrator disputes the descriptive potential of "latinized words", preferring the native, the "northern syllable" (line 1). The point is driven home by the over-Latinate allurement where allure would suffice. It is not surprising then that the nominalizations (bolded) tend to be native derivations in --ness, three of which are colours.

1925 Powys, John Cowper.Ducdame

For there is something in our northern syllable "spring" which suggests, not only the vernal fragilities themselves, but all that damp, chilly, earthy, moss-scented world out of which these little emerald-coloured blades and sheaths and filmy spears pierce their path into the air.

Latinized words, like the word "primavera," have their own sophisticated allurement; but the word "spring," full as it is of the very greenness of hyacinth stalks, the very blueness of hedge-sparrows' eggs, the very glint of celandine petals, has a sadder, more human significance; has something that carries the mind back, beyond the suppliance of any particular spring sound or spring sight, into the dark rain-soaked background which gave all these things birth ...

Something in the inmost nature of the young sycamores, for example, gave to their large, clumsy, sticky embryo leaves an embrowned glossiness that was as different from the diaphanous green of the beech buds flecked with translucent threads of moth-soft whiteness as was the delicate freshness of the larches, as if an emerald-coloured waterfall had splashed down upon them, from the sturdy outgrowths of the dogwood.

"I ought to tell you, Rook, that it is certain now. It's no good not telling you, is it?"

Some obstinate maliciousness in him made him refuse to let her off with this.
The use of qualities or attributes such as glossiness and whiteness in the description of nature provides the author with vehicles for further qualification. In this way, it is possible to avoid adding “embrazoned” or “glossy” to the list of adjectives (large, clumsy, sticky, embryo) which already depict the leaves, or to avoid a construction such as “translucent moth-soft white threads”. The constant repetition of this structure throughout the passage builds up a rhythm. But beyond these basic facilities, the nominalizations take the prose into the realm of the abstract, despite the tangibility of what is being described, in a search for natural essences, or that “sadder, more human significance”.

8. Conclusion

This study has provided information about the history of –ness and –ity from Early Modern English onwards. I have confirmed that there are are preferences according to register, for –ness in sermons and fiction, and for –ity in scientific and medical writing, although all registers have derivations in both suffixes, and there is no clear and unambiguous preference. Furthermore, it is hard to distinguish a preference for –ity from a preference for Latinate vocabulary generally. The above discussion locates the use of –ness and –ity in historical debates about style and vocabulary, and provides some sense of why deadjectival nominalizations, or more broadly, abstract nouns, are more productive in particular registers.

The approach to the alleged variation between –ness and –ity taken here is more comprehensive than previous studies, which either simply quantify types in –ness and –ity, using a corpus or dictionary, or examine isolated minimal pairs. Here the types in –ness and –ity are quantified, but then analysed to ascertain the extent of variation in the
corpus. Drawing on a concept of lexical variation, the variation between derivations in 

-ness and -ity is explored in relation to the lexicon as a whole.
6 Lexicalization

1. Introduction

In chapter 2, lexicalization, or loss of transparency, was treated as a methodological problem in the measurement of productivity in historical periods. If some of the types counted for a subperiod of a historical corpus are lexicalized, this may result in an inaccurate view of productivity for that subperiod. Yet there is no way of accurately determining whether a derivation was lexicalized or used transparently at a point in the past, as there are no speaker intuitions to appeal to, and the best the historical linguist can do is infer the meaning from the context. The new types measure was devised in part to deal with this difficulty. Through this method, certain lexicalizations with a high token frequency will not be recounted in each subperiod. The lexicalization of derivations is usually seen (predominantly in synchronic morphological theory) as a random and unsystematic occurrence, rather than as an inevitable process, . In this chapter I will attempt to integrate lexicalization into a diachronic theory of word-formation.

Conceptions of lexicalization are explored in section 2. Section 3 examines the boundary between lexicalization and semantic change in derivational affixes. Section 4 traces the lexicalization patterns of the nominalizing affixes treated in the present study. I also compare lexicalization in -(i)on, -ness and -ity to lexicalization in other nominalizing affixes, for which there appears to be some evidence. Section 5 considers the place of lexicalization in a diachronic theory of word-formation.
2. Defining lexicalization

Lexicalization is perhaps best known in the sense in which it is used by Talmy (1985) and Bybee (1985). This is the sense which corresponds to Bybee’s notion of “lexical expression”, described in chapter 2. In short, lexicalization or lexical expression is the expression of a combination of semantic elements by a single surface element, for example, the approximate semantic equivalence of “cause to die” and “kill”. Talmy illustrates the concept by showing that the phrase “what pressure?” as in “what pressure was exerted?” is actually asking “what degree of pressure?”. The word pressure in the question thus differs from the usual usage, Talmy claims, by “incorporating an additional meaning component”. Thus,

lexicализация is involved where a particular meaning component is found to be in regular association with a particular morpheme. The study of lexicalization, however, must also include the case where a set of meaning components, bearing particular relations to each other, is in association with a morpheme, making up the whole of the morpheme’s meaning. (Talmy 1985:59).

The notion of lexicalization or lexical expression that I am concerned with here is essentially the same that described by Bybee and Talmy. However, unlike Bybee and Talmy’s, my approach to lexicalization is diachronic. I will be specifically concerned however with cases in which a derivational expression (i.e. one in which semantic elements are associated with different morphemes) changes to a lexical expression (i.e. one in which semantic elements are associated with a monomorphemic surface expression). 1 Lexicalization is not consistently thought of in this way in word-formation theory. The glossary entry under “lexicalization” from Bauer (1988) is as follows:

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1 In chapter 1 I noted that Hopper and Traugott use the term “lexicalization” to refer to the way that “non-lexical” forms or grammatical items become “fully referential lexical items”, for example, the use of up as a verb rather than a preposition (1993:49). Although this conception is diachronic, I must again make it clear that this is not the notion of lexicalization I am concerned with here.
A word is lexicalized if it could no longer be produced according to productive rules. For example, the use of the suffix -th in words like warmth is no longer productive, and so all such words can be said to be lexicalized. Words may be semantically lexicalized if their meaning is no longer the sum of their parts (e.g. the meaning of highness cannot be predicted from the meanings of high plus -ness), or phonologically lexicalized if its form cannot be predicted by productive phonological processes (e.g. if long were used as a base in current English, it could not become leng, as it does in the word length). Words can also be lexicalized in other ways. (Bauer 1998:247)

The first situation described here, one in which the word-formation process is no longer productive (illustrated by -th), was referred to in chapter 1 as "fossilization". It is the fact that there are only a few existing words with -th that makes derivations in the affix lexicalized, as lexicalization in Bauer's view refers to the restriction of a rule to a set of lexemes. In "semantic" lexicalization, words are semantically lexicalized if their meaning is no longer the sum of their parts. It is not actually the affix which is limited to a set of lexemes, but a set of lexemes do not obey the general rule for the meaning of that derivational process. Thus, for "semantic lexicalization", even derivations in a productive process can be lexicalizations, if the derivation does not exhibit the predictable meaning.

Lexicalizations which are fossilized forms such as warmth and truth, actually have regular semantics, while roughness and hollowness, formations in a productive affix, have a lexicalized meaning, in that they can refer to "things" as well as qualities. In this chapter I will be concerned with "semantic lexicalization", or, the formation of non-compositional complexes.

Before proceeding it is necessary to differentiate between kinds of semantic lexicalization. One kind is what I will term the development of an "idiosyncratic" meaning. This is when a derivation demonstrates the predictable meaning of a word-formation rule, such as action/process in the case of action nominalization in -(t)ion, but denotes a more specific meaning of that rule, for example, the way that conservation
in Present Day English is used to refer to a particular action/process, namely the conservation of endangered species of animal life. These specific meanings are seldom exclusive, and the more general meaning is retained at the same time. The other kind is what I will refer to as a “general tendency” or “pattern” of lexicalization. This is when a word-formation process, in many of its derivations, develops a meaning which can be placed in a different semantic category from the predictable meaning of the derivational process. For example, the way that attribute/quality can lexicalize to concrete entity, in deadjectival nominalizations such as oddity and rarity. It is the latter kind of lexicalization that is treated in this survey.

3. Lexicalization and semantic change in affixes

Lexicalization and semantic change in affixes are two of the types of change identified for derivational affixes in chapter 1. Lexicalization is a semantic change that affects individual derivations, whereas semantic change in an affix involves a change in the semantics of that word-formation process as a whole, and takes place over a much longer time period. A connection exists between the two, in that cumulative lexicalization on a particular pattern is often supposed to result in a semantic change in the affix (see for example Riddle 1985). Yet it is difficult, and perhaps impossible, to determine how many cases of lexicalization it takes to constitute a semantic change in the affix. Consideration of this issue is a necessary part of an adequate analysis of the accounts of lexicalization in nominalizations and semantic change in nominalizing affixes.

Semantic change in derivational affixes has been discussed in relation to English negative prefixes by Adamson (1990) and Matthews (1991). The following negative
prefixes attach to adjectives in English: *in*-(indecent, incredible); *un*-(unkind, unsuitable); *non*-(non-toxic, non-standard); *dis*-(disloyal, disengaged); and *a(n)*-(asymmetrical, aperiodic, amoral). Historically, *in* has formed doublets with *un*-, such as *incomprehensible/uncomprehensible* (fourteenth century), *indemonstrable/un demons trable* (late sixteenth century), *inalienable/unalienable* (seventeenth century), and *insanitary/unsanitary* (late nineteenth century) (Matthews 1991:67).

These prefixes, Matthews notes, are not equally productive and subject to different restrictions. *Dis*-(also a reversative affix with verbal bases as in *dismount* and *disinterested*) is particularly unproductive. Adjectives which take *in* are typically Latinate, and the prefix is no longer productive. *Un*-, not limited to Latinate bases, is almost fully productive by contrast. Matthews suggests that the competition between *in* and *un*—“can also have a semantic dimension” (1991:72). The pair *immeasurable* and *unmeasurable* might be expected to be synonymous. “But *unmeasurable* means, literally, ‘not measurable’, while *immeasurable* carries more readily the special implication ‘of vast size’”. *Immeasurable* thus has an evaluative sense. In a similar way, *improper*, (by contrast with *unproper*) for modern readers, implies moral criticism. This split is a historical development: Shakespeare uses *improper* and *unproper* interchangeably (1991:72).

The same evaluative/denotative distinction can be found in *in-/non*- pairs (*irreligious/non-religious, insensitive/non-sensitive*) and *un-/non*- pairs (*unrenewable/non-renewable, unsocial/non-social, un-American/non-American*). In each pair the *non*- adjectives are not evaluative, but the *in*- adjectives in the first set and the *un*- adjectives in the second set are evaluative and refer to “a departure from the norm”.
This pattern is not always consistent however, and other adjectives in un- simply mean “not X”. Negated participial adjectives of the form un-X-ed are evaluative, but those in non- are not, as in uncommissioned versus non-commissioned. For Matthews, adjectives prefixed by a(n)- appear to be neutral (apolitical, atonal, asocial, alogical, anormal) along with “other new or relatively new forms … in the field of scientific terminology” such as aperiodic and aplacental (1991:74).

It is not possible to state unequivocally that the semantics of these negative prefixes has altered, because un- is not consistently pejorative. The contrasts arise only in paired sets of negative derivations. Matthews does not use the term “lexicalization” in conjunction with these developments, nor does he suggest that the semantics of the negative affixes have changed. The repeated pattern of lexicalization has however given this impression. Adamson describes these developments as change in the meaning of the negative prefixes, which follows a general pattern of “deepening subjectivity” (1990:505). She observed that it is unsurprising that negative prefixes should develop evaluative connotations given that “to negate is a basic logical function, but is also something that people do for other than logical reasons” (1990: 509).

Adamson, like Matthews, notes that in- and un- were semantically identical in the Renaissance, but that increasingly in the last few centuries the in- prefix has acquired “implications beyond straightforward logical negation” (1990: 509). The un- form, Adamson agrees, has also lost some of its neutrality, especially when applied to adjectives of nationality like “unBritish”. She points out that it is generally assumed that speakers intend to criticize a person or activity they describe as unsocial or

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2 A very clear case of pejoration of an un- derivation is unAmerican in the McCarthyism of the 1950s.
unprofessional. Adamson further suggests that there is a relationship between these developments and productivity. *A*- and *non-*-, used “only sporadically” in earlier stages of the language, “have become increasingly productive as a source of new adjectives in the past 100 years, with *a*- replacing *in-* in the formal register and *non-* challenging *un-* everywhere else”. She claims that the “massive expansion” in *non-* adjectives in this century is partly due to the way in which *non-* forms have replicated existing *un-* forms (1990:509-510). The process is an ongoing one. Even *non-* is showing signs of having shifted in the past 20 years, as new negative nominals (*non-event* and *nonfood*) and evaluative reanalyses of older words (*nonentity* and *nondescript*) suggest. A pejorative adjectival *non-* form is the ideologically motivated *nonwhite* of apartheid South Africa. Similarly in the case of *a(n)*-, *amoral* and *alogical* for some speakers “have already collapsed into *immoral* and *illogical*” (Adamson 1990:510).

These case studies of English negative prefixes could potentially be replicated with English diminutive affixes. Aitchison (1994) has observed an increase in the productivity of *mini-* and *micro-* (traditionally labelled as clipping and a combining elements respectively) among citations in the OED and occurrences in *The Times* newspaper. *Mini-* has appeared with transport and clothing words from the 1960s (*mini-cabs, mini-cars, mini-skirts, mini-coats, mini-shorts*), but today newspapers discuss *mini-booms, mini-enterprises* and *mini-conglomerates*. *Micro-*-, now also “prolific”, is attached to technical terms such as *micro-chip* and *microwave* (1994:19). Further searches for *micro-* words in the OED reveal that the suffix, which spread through its association with the microscope, has ceased to be used in connection with items which are not visible to
the naked eye, and has generalised to a simple diminutive sense, judging by words such as *micro-investigation*, *micro-graver* (archaeology), and *micro-deserts*.

Aitchison was alerted to these changes by an experiment in which adolescents were asked to supply diminutives for the form *wug*. Many subjects answered *wuglet* or *wugling* but some answered *mini-wug* or *micro-wug*. The obvious question then is, are older diminutive suffixes such as *-ling* and *-let* (and we might add *-kin*) being replaced by *mini-* and *micro-*, and is this due to the development of evaluative senses for older diminutive forms? Pejorative diminutives in *-ling* consist of contemptuous seventeenth century personal designations such as *popeling*, *vainling*, *worldling*, *lordling*, and *kinling*. Certain twentieth century items such as *starlet* and *tartlet* (with reference to young women) are examples of pejorative diminutives in *-let*, which, judging by the existence of forms such as *leaflet* and *bonelet*, is certainly not exclusively pejorative. As Adamson has noted with regard to negatives, there are more reasons to make something diminutive other than to call it “small”.

The similarities between the histories of English negatives and diminutives suggest that certain derivational processes may be predisposed to subjective interpretation. We have not been able to determine however, in either case, whether the evaluative meaning has become consistently associated with the process, or whether there are simply existing sets of derivations that have lexicalized with a pejorative meaning. It is not possible to answer that question here. I shall nevertheless pursue the topic of certain derivational processes being subject to certain lexicalizations. In the remainder of this chapter I shall ask: what type of lexicalization do *nominalizations* undergo? And can this ever be associated with semantic change in a nominalizing affix?
In chapter 5, with regard to minimal pairs in \(-ness\) and \(-ity\), I briefly mentioned the contention in Riddle (1985) that the suffixes \(-ness\) and \(-ity\) (as opposed to isolated derivations in these affixes) have developed distinctive semantics. According to Riddle, in Modern English, \(-ness\) tends to denote an embodied attribute or trait, while \(-ity\) tends to denote an abstract or concrete entity (1985:437). It was pointed that such a consistent semantic distinction would imply a violation of the sameness of meaning condition for variation. Riddle argues that studies of the productivity of \(-ness\) and \(-ity\) by Aronoff and others have been undertaken with the assumption that the suffixes are synonymous. She claims that semantic and pragmatic factors explain the choice between \(-ness\) and \(-ity\) more successfully than factors such as the phonological or morphological shape of the base.\(^3\)

Riddle illustrates her argument with minimal pairs from Present Day English in which only the \(-ness\) derivation is used attributively. These include:

\textit{hyperreactivity/hyperreactiveness, tangibility/tangibleness, reality/realness, brutality/brutalness, and pronominality/pronominalness.} It is easy to see how a distinction can be perceived from contrasted derivations such as the following: “The important thing about \textit{reality}, he implied, is our sense of its \textit{realness} in contrast to our feeling that some things lack this quality” (Goffman in Riddle 1985:438). Of the pair \textit{ethnicness/ethnicity, ethnicity} as an embodied attribute denotes nationality or race, not the “ethnic” nature of something. Riddle’s intuitive points about the majority of these cases however seem oddly personal and opaque. I will return to these pairs after a brief

\(^3\) Cf. semantic factors in the discussion of factors affecting productivity in chapter 2.
examination of Riddle's account of what she regards as a historical change that has
"advanced through lexical diffusion".

Riddle describes how -ness emerged strongly from early competition with other
native suffixes -hood, -dom and -ship and simplex bases, as in gladness/gladscip,
blinhe/de/blindness, good/goodness and word/worthiness. The suffix -ity began to make
inroads in the fourteenth century. Old English and Middle English words in -ness which
denoted "abstract or concrete entities" were replaced by:

(i) words in other native suffixes, e.g. wisness by wisdom.
(ii) simplex lexical items, e.g. brysedness by bruise.
(iii) -ity words on etymologically related bases, e.g. cristness by christianity.
(iv) -ity derivations on other bases, e.g. godnesse by deity, lessness by inferiority,
    afterweardness by posterity, and inbrydnisby humility.

-ity words were chiefly introduced into English with "abstract entity" meanings in
religious discourse, and this influx of "entity" words caused -ness entity words to lose
their meaning. -ness words which previously referred to entities were reinterpreted as
traits, for example haliness "religion" is reinterpreted as "holiness". In minimal pairs
such as dullity/dullness and vastness/vastity, it is the -ness derivation that is retained, and
this is with an attribute meaning. Any -ity words that denoted a trait have lost that sense,
and now only denote entities, for example, cavity. The net result of all of these changes
is that "except in a very few old -ness words denoting entities, such as witness, and
fastness, -ness is ceasing to be used to form words denoting anything other than a trait,
while a great number of \(-ity\) words now denote an abstract or concrete entity” (1985:449). These changes have affected the lexicon on a word-by-word basis over time.

The problems with Riddle’s article are intricate. I will first address her claims about the history of \(-ness\) and \(-ity\), for instance that \(-ity\) items were predominantly borrowed with entity meanings; then her claims about the present situation (\(-ity\) never denotes an attribute and \(-ness\) never denotes an entity), and finally the difficulties with the semantic categories she identifies.

Riddle’s insistence that \(-ity\) items were chiefly borrowed as entities rather than attributes is unfounded. The survey of lexicalization in \(-ity\) in section 4 will show that the majority of \(-ity\) derivations which have entity meanings have a prior quality or attribute meaning. \textit{Oddity} and \textit{deformity} are only two examples. Even if there is an existing version in \(-ness\), an \(-ity\) item can still be borrowed or coined with an attributive usage. In chapter 5 we saw that in Modern English (1900-1950), many new words in \(-ity\) have an attributive meaning, for example, \textit{biocompatibility}. Dalton-Puffer comments that Riddle “is very unspecific about the time dimension of this development”. Dalton-Puffer doubts that it is possible to establish “positive signs” for this diversification in Middle English. I would argue that this is also not possible after Middle English (1996:130).

Let us examine some of the minimal pairs that Riddle produces as evidence for her claims, such as \textit{hyperreactivity/hyperreactiveness}. \textit{Hyperreactivity} is not inappropriate for describing a characteristic or attribute. The following is hardly unacceptable: “Her hyperreactivity has ceased as a result of the new medication”. It is true however that few items in \(-ness\) can be used as labels in the way that \(-ity\) items can. \textit{Hyperreactiveness} seems inappropriate as a name for the syndrome. But this due to the
learned connotations of *-ity* and its use in specialized terminology, rather than a
systematic difference in meaning between the suffixes.

Nevertheless it is true that an entity meaning developed for *rarity* rather than
*rareness* and many such other cases, even though there is clearly no wholesale loss of
attribute meaning for *-ity* items. A more satisfactory account which does not run into the
same problems as Riddle is Romaine (1985). Romaine does not maintain that a difference
in meaning has developed between the two suffixes. She writes rather of the semantic
drift of individual derivations.

According to Romaine, the semantics of *-ity* derivatives are much less coherent
and “more widely divergent” than *-ness*. She says that “a great many of the established
lexemes ending in *-ity* have strayed from their original abstract sense to denote concrete
count nouns, and now have a collective or technical sense. The semantic wanderings of
dejectival formations in *-ity* appear to have followed a course from abstract to
concrete” (1985: 455). These semantic wanderings are illustrated for both *-ness* and *-ity*
in Table 1 below:
In this table Romaine charts the change of derivations in \(--ity\) from their abstract root sense denoting a state, quality or condition to their use as nouns denoting things, occupations, titles, offices or positions, or a totality of people associated with an occupation. A derivation does not have to occupy one slot only of course, and Romaine points out that \(curiosity\) can denote the state of being curious, but it can also denote “an object having the quality associated with the adjective”. The following concrete nouns still have an attribute sense: \(curiosity, antiquity, nobility, royalty, celebrity, holiness, highness, humanity, authority, nationality\).

Romaine points out that the same “semantic itinerary” or path of lexicalization is established for \(--ness\), “although the number of \(--ness\) formations which have strayed from their original abstract sense is far fewer”. A minor difference is that titles in \(--ness\) e.g. \(highness\) are actually forms of address rather than offices or positions. “Where competing \(--ness\) and \(--ity\) nominalizations exist,” Romaine claims, “they often occupy different
semantic spaces, e.g. *humanness* refers to the quality of being human, while *humanity* refers to the collectivity of humans; *antiquity* refers to an old object or time period, while *antiqueness* refers to the state of being antique" (1985: 456). Romaine attributes the fact that fewer derivations in *-ness* lexicalize to the high productivity of the suffix, a claim which I address in section 5.1.

The semantic change identified by Romaine is between the semantic categories of abstract and concrete, whereas the semantic change identified by Riddle is between the semantic categories of entity (abstract or concrete) and attribute/quality. A fundamental problem of Riddle’s argumentation is that it is not possible to consistently distinguish between an attribute and what she terms an “abstract entity”. Riddle defines abstract entities as “the names of concepts and situations and of characteristics in the general sense” (1985:437). Yet whether a deadjectival nominalization refers to an attribute or an abstract entity can only be determined on the basis of whether or not it is the object of a genitive. Thus *boldness* is an attribute in (a) and an abstract entity in (b):

(a) Catherine’s *boldness* startled the elders.
(b) *Boldness* was frowned upon in the small community.

There is no change in semantic category here. In a change from abstract (attribute or “entity”) to concrete, on the other hand, the referent actually changes from something abstract to something tangible and physical. 4 Jespersen (1924) discusses the logician J.L. Keynes’ attempts to distinguish attributes from “things” or “entities”. 5 Keynes eventually

4 Riddle does at one point explore the distinction between concrete and abstract, but identifies a tendency in the reverse direction to that identified by Romaine: “it is common for words to take on new senses, and typical such changes are from concrete to abstract and literal to metaphorical senses. From a sense denoting an abstract entity to a sense denoting a trait would be a similar type of change” (1985:451).

5 Keynes refers to the entire class as “concrete” which is different to Jespersen and my use of the term concrete.
rejects the distinction as entirely dependent on use. The implication of this is that any
attribute can have an entity meaning.

According to Jespersen, “it is habitual to distinguish two classes of substantives,
concrete and abstract” (1924:133). He defines “concrete” substantives as persons, objects
and “intangible phenomena” such as sound, echo, poem, lightning, month. Although it is
difficult to define “abstract substantives”, Jespersen believes the distinction is worth
preserving. It is necessary, he argues, to understand “what is peculiar to such words as
‘whiteness’ in contradistinction to other substantives”, and therefore a separate class of
abstract nouns should be recognized, “which we shall term nexus-substantives and
subdivide into verbal nexus-words (arrival) and predicative nexus-words (cleverness).”
(1924:136).

Riddle presents countability as a further argument for an attribute vs. abstract
entity distinction between -ness and -ity. -ity words frequently show plural forms, but
few -ness forms do. This is because more -ity words denote entities, and only entities are
countable (1985: 442). But there is no reason that attributes should not be countable. For
Langacker (1987, 1991), the class of nouns whose content is highly abstract have to as a
category be able to accommodate mass and count nouns, in the same way that the class of
nouns which denote physical objects has to be able to accommodate mass and count
nouns. Any noun is a “region in some domain” and count nouns simply mean that this
region is bounded in some way.⁶

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⁶ I use the term “thing” in the sense of a physical object. Langacker however uses it to represent the entire
category of noun, which is actually abstract since “it makes reference not to physical objects but rather to
cognitive events” (1987:183) and must be able to encompass “cup as well as exacerbation” (1987:190).
4. Lexicalization in ARCHER

In this section I systematically examine lexicalization in the nominalizations of ARCHER, with the aim of identifying general patterns of lexicalization for -(t)ion, -ness and -ity. I will also compare lexicalization patterns across deverbal, adjectival and deverbal nominalization processes, briefly introducing for comparison other nominalizing affixes that have not been treated in this study.

For each suffix I attempt to establish the "semantic itinerary" of derivations in that suffix i.e. the lexicalized meanings that derivations in that suffix tend to develop. I do this by looking up each type from ARCHER in the OED. This involves summarising very detailed OED entries, and the already noted problems of OED dating and representation. Yet I have drawn on the range of meanings that appear in the OED for a derivation rather than the range meanings that appear in the corpus, because it is unlikely that derivations would appear with their full range of meanings in this "small" corpus. The corpus is useful in that it provides a manageable sample of derivations in -(t)ion, -ness and -ity. I determine whether the OED entry registers a designated semantic category at some stage in the history of that derivation. I then quantify the proportion of types in that suffix which have historically shown, or still show, lexicalized meanings in that semantic category. Some of the meanings given by the OED for a derivation may be marked as rare, obsolete, or both, but these are nevertheless counted. First, it is necessary to delimit a set of semantic categories that will cater for the range of meanings expressed by derivations in -(t)ion, -ness and -ity.

Comrie and Thompson (1985) distinguish two classes of lexical nominalization: action/state nominalizations (the name of the activity or state denoted by the verb or
adjective) and nominalizations which name arguments of the verb or adjective, such as agentive nouns, instrumental nouns, manner nouns, locative nouns, objective nouns, and reason nouns. The first class retain properties of the verbs or adjectives that they are related to, while the other nouns have unpredictable and idiosyncratic relationships with the associated verb or adjective (1985:349). Comrie and Thompson do not address cases in which action/state nominalizations exhibit the same meanings as nouns which express arguments, as is frequently the case with action nominalizations in -(l)ion, -ness and -ity. What is interesting about Comrie and Thompson’s account is that action nominalization and stative nominalization are not presented as separate processes. Possibly one should infer that action nominalization takes place on verbal bases and state nominalization takes place on adjectival bases. Since this not made clear, it can also be inferred that action nominalizations can refer to states, and stative nominalizations can refer to actions.

In order to characterize the semantic aspects of derivation, Dalton-Puffer bases derivational categories on universal cognitive concepts. There is a need, she claims, for a framework “which includes categories general enough to enable us to compare different sets of suffixes in a straightforward and coherent way” (1996:120). The framework she adopts is based on Szymanek’s *Categories and categorisation in morphology* (1998). The derivational categories given for abstract nouns are not very different from the category labels for derived words which originate in case notions (cf. Beard 1998), which are similar, too, to Comrie and Thompson’s classification of nominalizations above. These are, with paraphrases: Nomina Actionis (action of V-ing), Nomina Essendi (quality of being A), Instrumental Noun (thing with which one Vs), Objective Noun (thing that is V-ed), Locative Noun (place of V-ing, related to N), Collective Noun (aggregate of Ns),
Diminutive Noun (small N). Formatives are then mapped onto these derivational categories.

Such a framework can show that an affix belongs to multiple categories, but it is also necessary to be able to quantify which derivational categories are most commonly expressed by derivations in that affix. The four main categories used in this survey are not proposed as a theory of derivational semantics, they are simply the most useful categories for the description of the semantics of this sample of derivations. They correspond to a wide range of theoretical models. ACTION/PROCESS and QUALITY/ATTRIBUTE correspond to Nomina Actionis and Nomina Essendi above; STATE/CONDITION which corresponds to the stative nominalization which is part of Comrie and Thompson’s overarching category of action/state nominalization. Finally, CONCRETE ENTITY subsumes several categories. Above I noted that Jespersen uses “concrete” to refer to persons and objects, and this is primarily what is referred to here as CONCRETE ENTITY. The OED applies “concrete” to “things” as distinguished from qualities, states, and actions, for substantives which were originally abstract. However, the OED uses the term inconsistently. Not all “things” for originally abstract substantives are identified as “concrete”. I have therefore independently classified some “things” as “concrete”, at the same time giving the numerical differences between my counts and that of the OED. Romaine (1985) identifies a wide range of categories besides things and persons as concrete: offices, titles, occupations and collectivities. I do not count these as CONCRETE ENTITY, but mention them individually when they occur for -(t)ion, -ness or -ity.

7 Noted in the introduction to the first edition.
-(t)ion:

Up to this point we have been concerned with the suffix -(t)ion only insofar as it derives nouns from verbal bases with the meaning ACTION/PROCESS. There are a number of action nominalizations that have lexicalized with idiosyncratic or specialized meanings. These can be idiosyncratic versions of ACTION/PROCESS, such as the specialized meaning of acquisition as the location of a target by radar. Or they can be idiosyncratic versions of an action that has already lexicalized as CONCRETE ENTITY, such as generation, “that which is generated”, more specifically, “offspring”. In cases such as damnation and botheration, an action nominalization has been lexicalized as an exclamation. Certain action nominalizations have developed pejorative meanings, for example, discrimination and dissipation, but there is certainly no tendency towards pejoration in the sense that there is for derivations in negative and diminutive affixes. In this section I will be concerned with the general tendency of action nominalizations to develop CONCRETE ENTITY meanings, and, to a lesser extent, STATE/CONDITION and QUALITY/ATTRIBUTE meanings. Comrie and Thompson note that “concretization” is “a very typical type of semantic specialization” of action nouns (1985:357).

Almost all the ARCHER types in -(t)ion, including early loans, have an ACTION/PROCESS meaning, and a large segment of them, including types such as penetration, normalisation, and transfusion, have it exclusively. The OED occasionally indicates an “instance of” or “special instance of” usage with ACTION/PROCESS, often with the indefinite article and/or plural. Some of the derivations so marked are demonstration, realization, transmutation, and vibration. This is not, however, a stable distinction.

Virtually any action nominalization with an ACTION/PROCESS meaning can be used as a
count noun, to express an "instance of". The OED has simply indicated which types tend to be used in this way regularly.

I have grouped together action nominalizations which the OED denotes as "state" or "condition" with those which the OED denotes as a "feeling", because feelings or emotions can be regarded as a subset of states. Among this set are: dislocation, hibernation, mortification, saturation, and starvation. Quite a few state/condition derivations have participial bases, for example exil aration.

Action nominalizations can also come to refer to someone or something's capacity or ability to perform that action. To this sense the OED applies terms such as "power", "faculty", "ability" or "property". I have classified these as quality/attribute, because the capacity to perform an action is also an attribute or property. For example, two of the many senses of accommodation include "property" ("the power of adjusting") and "quality" ("obligingness"). Other items in this category include: apprehension (ability to apprehend), definition, devotion, discrimination, imagination, invention (ability to invent), precision, provision (foresight), resolution, and sophistication.

In the same way that there is no principled way of distinguishing between the referents of attributes and abstract entities for deadjectival nominalization, there is also no principled way of distinguishing between the referents of instances of actions, and abstract entities. I have raised the issue here because the OED paraphrases several action nominalizations as entities which cannot be classified as concrete (person, thing or place),

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8 Although some action nominalizations are mass nouns, such as information and vegetation. But for both of these items, the action/process meaning is obsolete, and the only remaining meaning is an entity lexicalization, the entities in question not being countable. The OED does record historical uses of both derivations in the singular.
for example, *conclusion* (a "result" of the action), *presumption* ("that which is presumed"), *presupposition* ("that which is presupposed"). Further examples are: *approximation, aspiration, intention, limitation, consideration, corroboration, inhibition,* and *permutation.* While the referents of some of these entities will never be concrete (as in *assumption*), some of them can be concrete entities as well as abstract entities, for example *alteration, construction, contribution, convention* and *impression.*

There are numerous action nominalizations which lexicalize as *CONCRETE ENTITY,* few of which the OED actually marks as "concrete" or "quasi-concrete." The OED does mark some verbal objects as concrete, for example *enunciation,* but many are not marked as concrete, such as *admission, affirmation, allegation, contradiction,* or *denunciation.* This raises a rather metaphysical question about whether verbal object is a "thing" which I shall not attempt to answer here. I have counted verbal objects as concrete entities in this survey. Entities from action nominalizations form nouns which *NAME* different arguments of the verb. These could be broadly classified into:

(i) agent or instrument, paraphrased as "that which Vs". Some examples include: *administration, diversion, occupation, adhesion, attraction, circumvention, destruction, eruption, exemplification, fomentation, ignition, invitation, partition, prevention, purgation, and vegetation.* Note that *adhere, erupt,* and *vegetate* are not transitive verbs.

(ii) "patient", "result" or "product", paraphrased as "that which is Ved". Most entities seem to fall into this category. Some examples are: *adaptation, acquisition,*
annexation, calcination, calculation, classification, coagulation, corrugation, dilution, distillation, ejaculation, evaporation, excavation, exudation, insertion, narration, ossification, plantation, possession, publication, and transplantation. Not all of these correspond to “product” or “result”, which seems to depend on the nature of the process named by the verb. Those that do are calcination, coagulation, adaptation, calculation, classification, ossification, distillation, and evaporation. All of the bases of these derivations are transitive verbs, with the possible exception of coagulate and evaporate.

I will not attempt to exhaustively classify the concrete entities in -(t)ion entities into agent nouns and result nouns. In some cases it is not possible to actually distinguish between the two, for example does signification refer to that which signifies, or that which is signified, and is a fortification a structure which fortifies, or a structure which is fortified? The OED paraphrases insulation as “that which insulates” and “that which is insulated”. Some similar instances are: bifurcation, communication, condensation, connection, and imposition. Some entities have more indirect relationships with ACTION/PROCESS, such as explosion (the resulting noise) and competition (the occasion at which agencies compete), but this may have to do with a more advanced level of idiosyncratic lexicalization of the concrete entity.

Of the 1070 -(t)ion types in ARCHER, 421 (39%) are ACTION/PROCESS only. Another 355 (33%) are ACTION/PROCESS and CONCRETE ENTITY. Only 145 of these are marked as concrete by the OED. The remainder of types may have multiple semantic categories: 131 (12%) of these show a STATE/CONDITION meaning, and 50 (7%) a QUALITY/ATTRIBUTE meaning. A small number of the types (15) have no recorded
ACTION/PROCESS meaning. All are early loanwords, such as constellation, region, sanction and ammunition. On the whole, these results suggest that lexicalization, particularly as CONCRETE ENTITY, is, for action nominalizations in -(t)ion, by no means an uncommon development.

The OED records a “special instance” meaning for 94 (9%) of the total number of types in -(t)ion in ARCHER. Most of these (50) are ACTION/PROCESS only; a further 20 are ACTION/PROCESS + CONCRETE ENTITY, and the remainder are various combinations of all the categories with no particular combination predominant. This suggests that “instance of” is not necessarily associated with entity lexicalization. Alternatively, the 50 ACTION/PROCESS items may be incipient entities.

Of the 355 CONCRETE ENTITY lexicalizations, 195, according to the OED’s dating, show an earlier ACTION/PROCESS meaning, and 42 show an earlier CONCRETE ENTITY meaning. For the remaining 118, the first citations for these semantic categories were less than 50 years apart, which was used as the arbitrary cut-off point for indeterminate directionality. These results support arguments for directional change from ACTION/PROCESS to CONCRETE ENTITY. However, the high number of loanwords which may have been lexicalized in French or even Latin tend to lessen the possibility of determining a clear direction for lexicalization. There are also some cases in which a lexicalized derivation in -(t)ion is reinterpreted as ACTION/PROCESS, for example, affection, which I shall return to in section 5.
-ity:

The debate surrounding the semantics of –ness and –ity and the lexicalization of derivations in the two deadjectival nominalizing suffixes provides some indication of which semantic categories are likely to be prominent in this survey of the lexicalization of deadjectival nominalizations in –ness and –ity.

The basic meaning of deadjectival nominalization in –ity is QUALITY/ATTRIBUTE. Some examples of types which show this meaning only are: adaptability, anonymity, centrality, cordiality, docility, ferocity, generosity, intrepidity, magnanimity, perversity, rapidity and toxicity. It is common for deadjectival nominalizations in –ity to be described as denoting “state” or “condition” by the OED. The types passivity and maternity, for example, show this meaning in addition to QUALITY/ATTRIBUTE.

Concrete –ity derivations are usually paraphrased by the OED as adjective + “thing” or “person”, as in “rare thing” for rarity, “useless thing or person” for inutility, and “familiar person” for familiarity. This is not always the case. For example, felicity is a “source of happiness” rather than a “happy thing”, although the latter is not exactly inappropriate. In the same way that it is difficult to define “thing” for lexicalized action nominalizations, there are some deadjectival nominalizations for which this is difficult to define, for instance atrocity, hostility and barbarity. These words can refer to acts, or deeds, as well as qualities. Actions, or instances of an action were not regarded as entities in the case of action nominalizations, and it would therefore be inconsistent to do so here. These uses are therefore not classified as belonging to a different semantic category, and I regard them as “instances of” QUALITY/ATTRIBUTE.
There are several types labelled as entities by the OED, which cannot always be regarded as a person, thing or place, but should nevertheless be mentioned here. They include *heterogeneity* ("heterogenous element"), *instrumentality* ("that which serves an end") and *sentimentality* ("sentimental notion").

Of the total 393 types in *-ity* in ARCHER, 188 (48%) are **QUALITY/ATTRIBUTE** only, and 76 types (19%) are **QUALITY/ATTRIBUTE** and **CONCRETE ENTITY**. Only 21 (5%) of these are marked by the OED as concrete, including *celebrity, deity, enormity, immobility,* and *humidity*. Some of the types that I have additionally classified as concrete are: *curiosity, rarity, solidity, propensity* ("overhanging part"), *extremity, locality, vacuity,* and *viscosity*. There are 37 types paraphrased by the OED as entities which I have not classified as concrete, and some of these are: *formality, obliquity, opportunity, singularity* and *veracity*.

A total of 52 types (13%) have a **STATE/CONDITION** meaning in addition to **QUALITY/ATTRIBUTE**. Some of these are *fatality, illegality, humanity, immunity, impurity, inactivity, insanity, jollity, maternity, monstrosity, passivity, reactivity, scarcity, simplicity,* and *tranquillity*. Of this set, 17 have an additional **CONCRETE ENTITY** meaning (*impurity, infallibility, insecurity, irregularity, monstrosity, mortality, necessity, neutrality, obscurity, practicability, principality, profanity, purity, respectability, seniority, superfluity, unity*).

A further 26 types (7%) have a **STATE/CONDITION** meaning and no **QUALITY/ATTRIBUTE** meaning. These include: *adversity, captivity, maturity, parity, prosperity, proximity, relativity, rigidity, sanity, senility, servility, virginity* and *vorticity*. There seems to be little consistency in the elision of a **QUALITY/ATTRIBUTE** meaning, for
instance, *insanity* has both meanings but *sanity* is only *state/condition*. Similarly, it is hard to see why *maturity* or *rigidity* should not be considered qualities or properties as well as states. Some of these items however, do display an interesting semantic distinction: *adversity, captivity, and prosperity* are not characteristics that can be demonstrated by human beings. *Virginity* and *senility* are, but they are not (typically) brought about through conscious agency. Of these 26 *state/condition* only types, 8 have an additional *concrete entity* meaning (*integrity, laity, majority, minority, popularity, privity, security*).

I have identified only 6 types (2%) which show the other concrete meanings identified by Romaine. *Dignity, gentility, quality, nobility* and *superiority* have all been used to refer to position or rank, and *gentility, quality, nobility, rascality, and superiority* are all collectivities. One item, *annuity*, shows *concrete entity* only, but this is the only type like this for *-ity*.

Of the total of 393 types, 45 (12%) were marked as "instance of" by the OED. As was the case for action nominalizations, the majority of these showed the basic derivational meaning only, in this case *quality/attribute* (22). A further 10 showed *quality/attribute + concrete entity*. The remainder all showed a *state/condition* meaning with various combinations of other semantic categories.

Of the 76 types which show only a *quality/attribute* and *concrete entity* meaning, it can be established for just over half (39) of these that *quality/attribute* is prior to *concrete entity*. This is the case for *charity, declivity, immensity, ingenuity, solidity* and *viscosity*. For only 9 of the 76 types can it be established that *concrete entity* is prior to *quality/attribute* (*cavity, community, concavity, extremity, ...)
*fraternity, gratuity, quantity, university and vulgarity*), all of which are early loans. For a substantial proportion (28), it is impossible to establish anteriority. Some of these include: *commodity, curiosity, convexity, infirmity, rarity, technicality, vacuity* and *vanity*.

The greater proportion of derivations which show a directional change from QUALITY/ATTRIBUTE to CONCRETE ENTITY suggests that this is the more likely direction of lexicalization. If this is the case, then some types which reflect the reverse direction may be renalyses of loanwords which have entered the language with a lexicalized meaning, such as *cavity*, which is first cited in 1541 as a “hollow place”, and for which the OED lists a rare and shortlived meaning of “hollow quality” (1679).

**-ness:**

Of the total of 426 types in **-ness**, 154 (36%) are QUALITY/ATTRIBUTE only. 139 (32%) are QUALITY/ATTRIBUTE and STATE/CONDITION for example, *baldness, coldness* and *completeness*. Another 55 (12%) are STATE/CONDITION only, for example *blessedness, emptiness* and *filthiness*. The number of types which are QUALITY/ATTRIBUTE + CONCRETE ENTITY is 38 (8.6%). A further 23 (5.3%) are QUALITY/ATTRIBUTE + STATE/CONDITION + CONCRETE ENTITY.

*Wilderness, witness and business* are probably the best-known cases of the lexicalization of derivations in **-ness** as CONCRETE ENTITY. But concrete entities in **-ness** are not so much less common than concrete entities in **-ity**. For example *fatness*, defined as “plumpness” as well as “a greasy or oily substance” (both meanings are given as

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9 *Business* shows phonological change [bɪznəs] which accompanies the loss of transparency associated with the lexicalization.
c1000) is used with the latter sense in ARCHER, in this sentence from Richard Head and Francis Kirkman’s *The English Rogue* (1665): “His skirts were so liquor’d and greas’d, that in case of extremity they might have served for belly-pieces, not using any thing but their own fatness to fry them in.” Some other concrete entities are foulness, roughness, hollowness, highness and steepness (as in a high or steep place).

Types in –ness which develop concrete entity meanings, like those in –ity, tend not to denote human characteristics. In other words, it is foulness, hollowness, and ruggedness which lexicalize as concrete entities rather than crossness, drowsiness or childishness. This does mean that derivations which denote physical rather than personal characteristics automatically lexicalize as concrete entities. There are many which do not, for example dampness, and coldness. Some human attributes which are often used as count nouns, such as kindness, may be marked “instance of” by the OED. These are not concrete entities. Of the other categories classified as concrete by Romaine, there are few examples from ARCHER, mainly titles such as worthiness in addition to highness and holiness.

Most items in –ness which have a concrete entity meaning are too old for any direction of lexicalization to be established. There are some clear cases of a prior quality/attribute meaning, for example business, roughness and steepness which are first cited with quality/attribute meanings in 950, 1398, and 1440 respectively, are cited with concrete entity meanings in 1385, 1674 and 1585 respectively. Oddness, unlike the other concrete entity lexicalizations, clearly has a prior quality/attribute meaning. The derivation means “unique character” in 1587 (the first citation), and “something odd” in 1713. This concrete meaning is marked as obsolete however, and it is
*oddity* that becomes associated with the *concrete entity* meaning. The same developments are not true for *rareness*, which, unlike *rarity*, does not lexicalize, and maintains only a *quality/attribute* meaning. An example of a prior *concrete entity* meaning is *hollowness* which is given as “hollow place” 1398 and “hollow quality” in 1440.

A further lexicalization pattern which must be mentioned with regard to *-ness* is the semantic change in types such as *bigness, goodness* and *heaviness* from adjective + quality to the senses of “size”, “quality” and “weight”. Both kinds of uses were demonstrated in chapter 5. According to the OED entry, the “size” meaning for *bigness* (1529) is slightly later than the quality meaning (1494). Interestingly, the attribute meaning is reanalysed in the nineteenth century. *Concrete entity* is not appropriate for the description of these lexicalized meanings, because *size* and *weight* are still qualities or properties. This is a specific tendency which takes place within the category *quality/attribute* and affects terms that are used for measurement.

*-*age:

The *-age* suffix forms deverbal and denominal substantives, mostly through analogy of Middle English loans from French (Marchand 1969:234-236). Denominal derivations have specific and concrete meanings:

(i) “right, liberty, toll”, for example *wharfage* (translations of Medieval Latin *wharuagium*) and *corkage* and *postage* (later English derivations).
(ii) "rank/office" or "collectivity" with personal nouns for example the loan baronage and Later English derivations baronetage and knightage. These also have a STATE/CONDITION meaning.

(iii) "collectivity" with non-personal nouns, usually with the sense of "system" or "material", as in freightage and pipage. Certain words, such as voltage, denote "the total of measure units".¹⁰

(iv) "abode" such as orphanage, parsonage and vicarage which were formed by analogy of hermitage (the abode of a hermit). This place meaning would correspond to "locative noun" in the frameworks described earlier. In the OED orphanage is first cited with a STATE/CONDITION meaning (1579), then "orphans collectively" (1845), and finally "an institution or home for orphans" (1865). It is less possible to identify a direction of lexicalization for parsonage and vicarage as their various meanings occur closer together in the OED.

The original sense of deverbal nominalizations in -age ("act/fact/mode of") is taken from the meaning of the borrowed French words fèriage, stoppage. There is a change from ACTION/PROCESS to CONCRETE ENTITY for derivations such as package, which originally meant "act, fact, privilege of packing" (1611), package and luggage ("that which is lugged about"). Some types in ARCHER which show this pattern of lexicalization are carriage, cleavage and coinage. Carriage also has the sense of duty or fee, and cleavage

¹⁰ Footage shows an interesting development, initially denoting, according to the OED, a "system of paying miners by foot of work" (1892), also, "the amount paid to miners" or "the amount mined". In 1916 it means "length in feet of cinematographic film used in photographing a scene". This has extended in the late twentieth century to any filmed material of an event (not in the OED).
the sense “state of being cleft”. Marchand notes that a “result” meaning is common among concrete entities in –age, for example slippage, shrinkage, spillage and wreckage. It is not clear however whether these are cases of lexicalization, or whether these items are coined with a “result” meaning. Finally, certain deverbal derivations have a “place” or locative meaning, for example anchorage and moorage are coined with a concrete meaning.

–age may be showing some interesting developments in the late twentieth century, in US terms such as outage (as in “power outage”) and slang words foodage and caveage. Marchand mentions US overage (a banking term), which he associates with roughage and shortage. These last two derivations, as well as overage and outage, are actually deadjectival. If such a function is developing, it does not denote quality/attribute like –ness and –ity, but rather an event, or concrete material or amount.

-ment:

The suffix –ment forms deverbal nouns from Romance roots from 1300, on the basis of predominantly Middle English loans such as achievement and agreement. There are some shortlived fourteenth and fifteenth century coinages like chastisement and increasement, but the pattern stabilises after 1450 yielding forms such as astonishment, retirement, equipment, and arrangement (Marchand 1969:331-333). Derivations can have an action/process meaning, which includes “specific instance of x”, for example development, a state/condition meaning, for example amazement; or a concrete entity meaning. Marchand paraphrases the latter as “something concrete or material connected with x” for
example _advertisement, embodiment_, and it is unclear whether these have a result or
agent meaning. Finally, -ment derivations can be locative nouns, for example _settlement_,
which is on a native base.

**-dom, -hood and -ship:**

The primary meaning of derivations in -dom is “jurisdiction, authority of”, as in
_kingdom, popedom, and churchdom_ (Marchand 1969:262-264). This meaning has an
aligned sense of STATE/CONDITION. A concrete offshoot sense of “territory” is manifested
from Middle English in words such as _dukedom_ and _kingdom_, and continued in the
modern _czardom, sheikdom_, and figurative territories _fairydom_ and _gipsydom_. Another
concrete meaning in American English is “collectivity”, in derivations of personal
substantives (_artistdom, scholardom_) or derivations which denote a group united by a
common interest (_golfdom, moviedom_).

Derivations in -hood from Old English such as _childhood_ are not only rank/order
but also STATE/CONDITION (Marchand 1969:293). The current denominal meaning of the
affix is “status of” (widowhood) with nuances of “time, period” (boyhood). Denominal
derivations can also denote a collectivity, as in _priesthood, sisterhood_. Deadjectival
derivations (from Middle English) with the meaning “state of being” and “instance of”
such as _falsehood_, are less numerous and no longer productive.

The suffix -ship also forms denominal substantives from personal nouns with a
STATE/CONDITION meaning, for example _friendship, lordship, comradeship_ (Marchand
1969:345). When the personal substantive is an agent, the derivation can denote “action”
rather than “state” as in _censorship_. This may also be the source of the “skill, art”
meaning of _horsemanship_ and _brinkmanship_. There are concrete meanings such as
“office, dignity, rank of” for example _ambassadorship_, and “title” as in (your) _ladyship_.

Not all bases are personal nouns, and some of the Old English derivations denote community, for example *township*. According to Marchand CONCRETE ENTITY senses “have never much developed” despite the existence of Old English *weterscipe* “piece of water”. There are some Old English and Middle English STATE/CONDITION deadjectival derivations in –*ship* such as *hardship*. On the whole it seems that denominal nominalizing suffixes (apart from –*age*) seldom occur with non-personal nouns to form concrete entities.

**-ism:**

This suffix productively forms “abstract substantives” which signify a “doctrinal system of principles” of a “religious, philosophical, political or literary character”, such as *catholicism, Marxism, behaviourism, communism, fascism* and *surrealism* (Marchand 1969:306-308).\(^{11}\) This appears to be a denominal process, but it may depend on the diachronic relationship of the derivation to adjectival bases in –*ist* (*communist, fascist*). There do not appear to be any concrete meanings for derivations in –*ism*.\(^{12}\)

These derivations may demonstrate a type of lexicalization which we have not yet observed among nominalizations, but only among non-category changing derivational processes, such as negatives and diminutives, and this is pejoration. Marchand observes that a set of coinages in –*ism* are of a “disparaging character, including *colonialism, favouritism, blackguardism* and *defeatism*”. Many items are actually coined with a

\(^{11}\) An alternate old Greek meaning of –*ism* derivations which passed into Latin is the “idiom, peculiarity of speech” meaning, borrowed into English and still productive today, for example *Americanism*.

\(^{12}\) With the possible exception of *mechanism* and *organism*, which both occur in ARCHER, and both refer to a system of organisation that is also a concrete entity.
pejorative meaning. Good examples are *scientism* and *old-maidism*. The latter appears in ARCHER (see chapter 5). If words can no longer be coined in –ism with a neutral meaning then we may be able to speak of semantic change in this affix. Like –ism, –dom forms pejorative words from 1800, for example *cuckoldom, rascaldom, bourgeoisdom*. According to Marchand the neutral “status” is no longer the leading sense (1969:263).

5. The place of lexicalization in a diachronic theory of word-formation

From this survey it is clear that **ACTION/PROCESS** is the primary meaning of –(t)ion, and that **QUALITY/ATTRIBUTE** is the primary meaning of –ness and –ity (closely followed by **STATE/CONDITION** in the case of –ness and –ity), but that lexicalization as **CONCRETE ENTITY** is not uncommon for any of the three suffixes. There are indications that a **CONCRETE ENTITY** meaning may be a diachronic development for nominalizations in –(t)ion, and possibly –ness and –ity, which would correspond to the drift from abstract to concrete for –ness and –ity suggested by Romaine. The close correspondence between **QUALITY/ATTRIBUTE** and **STATE/CONDITION** may militate against drawing a distinction between the two, which are conflated in Comrie and Thompson’s framework. What emerges from the above discussion is that deverbal, deadjectival and denominal nominalizations can inhabit the same set of semantic categories. It was not possible to proportionally establish the most common semantic category of nominalizations in the other suffixes, but they show similar profiles to –(t)ion, –ness and –ity. Deverbal nominalizations in –age and –ment show **ACTION/PROCESS, STATE/CONDITION** and **CONCRETE ENTITY** meanings; denominal –age, –hood –dom and –ship show **STATE/CONDITION**, but only denominal –age shows **CONCRETE ENTITY**. “Collectivity” is
common to almost all processes except deverbal -age and -(t)ion. Other concrete meanings such as rank/office are shown by derivations in -hood, -dom,-ship and -age, and titular forms of address by -ness and -ship, and locative nouns occur in -age and -ment. The remainder of this section examines the relationship of lexicalization to the other important aspects of diachronic word-formation that I have examined in this study, namely productivity, register differences and variation.

5.1. Relationship between lexicalization and productivity

Aronoff has argued that if a word-formation process has listed forms in the lexicon with irregular semantics, these can limit the productivity of that word formation process:

> Seen as a result of listing, semantic drift might itself undermine the productivity of the WFR whose derivatives must be listed. Once a class's semantics has become incoherent through semantic drift, we run into the same practical problem we faced concerning its form. Assuming of course that the meaning of an affix is somehow connected with its distribution, with its meaning in individual forms, our ability to predict the meaning of a new form will be impaired by the arbitrary meanings of the existing listed forms. Thus, listing may affect productivity though a semantic connection. (Aronoff 1976:43).

The irregular semantics will prevent speakers from being able to predict the meaning of these derivations and thus limit this (potential) productivity. Because Aronoff is a synchronic theorist, it does not concern him whether it is actually semantic irregularity that leads to low productivity or the other way around. Low productivity (and its

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13 Dalton-Puffer observes for Middle English that “suffixes which form Nomina Actionis tend to have ties also to Instrumental, Objective, Locative, Collective.” (1996:125) The action nominalizations with the widest array of relations are -ung and -ment. Other Nomina Actionis suffixes (Romance and Germanic) usually have a subset of these relations. Of the other nominalizing suffixes she comments that among the native suffixes there are at least four whose pattern of semantic relations is identical: -heide, -dom, -ship, -reden. All four suffixes produce Nomina Essendi and Collective Nouns. These categories are also represented by Romance -ity and Germanic -ness, developed into a highly productive source of Nomina Essendi derived from adjectives. Formatives which express both Nomina Actionis and Nomina Essendi are -acioun, -ounce, -erie, -age, -lac and -th.
accompanying lack of exposure to derivations in a certain process) may cause derivations to lose their associations with that process. Whichever one it is, the point is that Aronoff has only sufficient information to note an association; yet in the above passage he clearly introduces a causality.

Romaine supports Aronoff’s thesis that “a morpheme whose meaning is more semantically coherent will be more productive”, confirming that “the fact that the semantics of –ity formations is less predictable and less regular than that associated with –ness formations is implicated in productivity since people will not tend to use words whose meaning is unclear to them.” (1985:457-458). However, it may be that the increasingly specialized and restricted uses of –ity render derivations in the suffix more susceptible to lexicalization.

It is instructive to compare lexicalization in –ness and –ity (on which Aronoff’s argument is based) to the lexicalization of derivations in –(t)ion. –(t)ion is overwhelmingly more productive than –ity, yet demonstrates a similar if not greater amount of lexicalization. This suggests that the low productivity of –ity is not due to its irregular semantics, but the competition supplied by –ness. Of course, –(t)ion and –ity are both Latinate affixes and it may be this factor that underlies their levels of lexicalization, given that words can be borrowed with irregular or lexicalized meanings. Yet, considering the high productivity of –(t)ion once again, this aspect does not necessarily impact on productivity.
5.2. Relationship of lexicalization and semantic change in affixes to register

In this study I have focused on the differential productivity of nominalizing affixes according to register. Evidence arising from this brief examination of lexicalization suggests that the differential lexicalization of nominalizations according to register is a subject for future study. For certain nominalizations, the lexicalized meaning of a derivation is more common to a particular register. For example, the specialized meaning of gravity evolves in the scientific register, but the word continues to appear in other registers with the sense of “solemnity”. In section 4, with regard to –tion, I mentioned cases in such as affection, a word borrowed with the sense of “emotion” and reanalysed as “the act of affecting”. Affection appears with this later meaning in the scientific register of this corpus. The same is true of inspiration, which appears with its literal (and original) meaning (“intake of breath”) in the medical register, whereas in all other registers it appears with its lexicalized meaning “creative energy”. In the same way that lexicalization may take place in specific registers, it may take place in regional dialect, for example, transportation in the sense of “means of transport” is American English, and so is the meaning of facility as a “physical means for doing something” (OED). Register is also potentially a factor in the semantic change of affixes. It is in the scientific register that the use of the neutral negative prefix a(n)- and the neutral micro- diminutive prefix has been promoted.

5.3. Lexicalization and variation

It is through lexicalization that –ness derivations such as bigness, goodness and heaviness can vary with lexical items such as size, quality and weight. This is not the only
lexicalization pattern to make variation between lexical items possible. The variation between deadjectival nominalizations in -ness and deverbal nominalizations in -(t)ion noted in chapter 5 is a result of the quality/attribute meaning developed by certain derivations in -(t)ion. The following list from ARCHER which demonstrate this lexicalization pattern are all actually glossed with a -ness derivation in the OED: incision (incisiveness), obligation (obligingness), persuasion (persuasiveness), precipitation (precipitousness), pretension (pretentiousness), and seduction (seductiveness).

In a slightly different case, celebration means the same as celebrity at one point (1710). This is because both types are lexicalized as concrete entity, more specifically, a person. The same can be said about locality and location, and vicinity and vicinage. Transportation, lexicalized as “means of transport” in American English, varies with transport (the noun conversion). Even -dom derivations vary with derivations in -ism because both are pejorative, as in gangsterdom/gangsterism (Marchand 1969:264). It is the similarity in lexicalization patterns across nominalizing affixes that is responsible for much of the variation between derivations.
Conclusion

This study has recorded fluctuations in deadjectival nominalization in \(-ness\) and \(-ity\), and deverbal nominalization in \(-tion\) in Early Modern English and Modern English, through monitoring the performance of the suffixes in the Early Modern English section of the Helsinki Corpus and the ARCHER corpus. In addition to basic description, the study aimed to demonstrate how change in word-formation (the increases and decreases in productivity related to neologising activity) is driven by extralinguistic factors. I explored the ways in which register affected neologising activity in the three nominalizing processes. Different registers showed different levels of innovation for different suffixes. Scientific and medical writing produced the most new words in \(-(t)ion\) and \(-ity\), and fiction and sermons produced the most new words in \(-ness\). There was no evidence to suggest that any of the suffixes was more productive in different registers at an earlier time.

From the textual analyses it is clear that the attribution of neologising to a need to name new objects and concepts, is an inadequate explanation of the motivations for neologising. Neologisms may, in the case of nominalization especially, be created for the function of textual cohesion. Nominalizations in \(-(t)ion\), \(-ness\), or \(-ity\) can be formed to effect a particular style. Furthermore, the creation of abstract nouns often has to do with the reification of concepts expressed by the verb or adjective, giving them a place in a particular system of knowledge, for example Hooke’s 1665 natural states of the “bruite Animal’s soul”: \textit{germination, plantamination, animation, sensation} and \textit{imagination}.
One of the major contributions of this study is methodological. The measurement of productivity in historical corpora is particularly challenging as this area is so under-researched. Most of the difficulties, I believe, are due to small corpus sizes. In addition to methods of measuring productivity in historical corpora, I have also developed methods for the comparison of neologising activity in different registers. I have emphasized the use of textual analysis in the study of register variation, as the quantification of new words for different registers cannot alone reveal the motivations for neologising.

I treated competition or variation and lexicalization as issues that are central to a diachronic theory of word-formation. With regard to the first, I acknowledged that suffixes compete, including \textit{ness} and \textit{ity}, but concluded that for derivation, variation is best treated on a lexical basis, as competition between derivations and monomorphic lexemes can affect the use of that word-formation process. Lexicalization is not a phenomenon that occurs in isolated derivations, and the investigation in chapter 6 has shown that it is a reasonably common process for derivations. The meanings of nominalizations can correspond to a range of semantic categories, and for some nominalizing processes it is not possible to isolate one primary or prior semantic category. However, for nominalizations in \textit{tion}, and potentially also \textit{ity} and \textit{ness}, there seems to be a diachronic dimension to the different semantics shown by derivations.

This study raises numerous issues for future research. A broad study across a range of registers lays the foundation for in-depth studies of neologising activity in a single register. In chapter 1 I reproduced Kastovsky and Kryk-Kastovsky’s list of research questions for the study of the text-cohesive functions of word-formation. Two questions were omitted in Chapter 1. The first is: “which word-formation processes are
involved in establishing text-cohesion”? (1997:466). To which I would like to add: and
which are used for stylistic or poetic effects? In this study I have focused on
nominalization, but a theory of neologising should accommodate all word-formation
processes. The discourse motivations for neologising differ for different word-formation
processes. The second question is: “are there language-specific differences in the
exploitation of word-formation for text-cohesive functions?” More broadly, there is a
need to investigate the conditions which promote neologising in different languages and
different cultures. As a cultural practice, neologising is subject to the structures of
authority or spheres of influence of a society, and its norms of linguistic behaviour.
Appendix I

Table 1 Types and tokens in -(t)ion in HCE

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<th>1640-1710</th>
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Table 2 Types and tokens in -(t)ion in ARCHER

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Table 3 New types in -(t)ion in ARCHER with HCE starting lexicon

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Appendix II

Table 1 Types and tokens in -ness and -ity in HCE

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Table 2 Types and tokens in -ness and -ity in ARCHER

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Table 3 New types in -ness and -ity in ARCHER with HCE starting lexicon

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References


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