Title

Analysing reanalysis

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Abstract

Reanalysis, as understood in traditional historical linguistics, lacks explanatory force as a mechanism of language change, because the assumption that reanalysis works through ambiguity is logically flawed, and because reanalysis postulates a shift from an old to a new representation without specifying the source of the new representation. Therefore, two cases of syntactic reanalysis are examined to produce a more convincing picture of how reanalysis operates. One is the development of the English adjectives *worth* and *worthwhile* when used with gerund clauses. The other is the emergence of the English *for…to*-infinitive. On the basis of these case-studies it is shown that reanalysis can be decomposed into more basic mechanisms of change. These mechanisms involve 'category-internal change' resulting from semantic change, 'categorial incursion' through analogy, and 'automation'. Each of these underlying mechanisms obtain additional plausibility from the fact that they are firmly based in synchronic language use as understood in current usage-based models. One consequence is that reanalysis itself becomes to some extent epiphenomenal to the more basic mechanisms.

Keywords

analogy, gerund, infinitive, reanalysis, semantic change, syntactic change

1. The problem and its ramifications

As a mechanism of linguistic change, reanalysis has an important share in explaining the syntactic changes that take place in language history. Along with analogy, reanalysis is commonly considered one of the two principle language-internal mechanisms of syntactic change (e.g. Harris & Campbell 1995; Hopper & Traugott 2003). Essentially, while analogy works across syntagms, involving the extension of a form from one syntactic environment to another, reanalysis occurs within syntagms and causes the assignment of new syntactic representations to existing surface forms.

The following more precise description of reanalysis (conforming to the definitions in Harris 2003; Harris & Campbell 1995; Langacker 1977; Timberlake 1977) is more or less commonly accepted. As stated, reanalysis takes place on the syntagmatic level of language, causing a single surface sequence of linguistic elements to receive a new syntactic and semantic interpretation. This happens as an alternative analysis is assigned to an existing surface sequence in ambiguous environments. The immediate result is a split between an old representation and a new one for the same surface sequence; later, the newly established representation may manifest itself in new surface sequences irreconcilable with the old analysis. This gives reanalysis some of its central characteristics: it takes place abruptly, consisting in a leap from one discrete syntactic category to another, and (from a language-internal perspective) it has the potential of introducing a genuine novelty in grammatical structure.

This description of reanalysis can be visualised as in Figure 1. Rectangles represent surface sequences; circles the more abstract syntactic structures they instantiate – with double arrows marking the relationships of instantiation. Full lines represent the starting point of change; dotted lines the innovations; and numbering is used to mark different stages. As can be seen from Figure 1, reanalysis is a two-step change: the first step – the reanalysis proper – establishes a new category on the basis of ambiguous instances still licensed by the old source construction. The second step – the actualisation stage – creates new instances no longer licensed by the source construction.

[INSERT FIGURE 1 HERE]

Fig. 1. Reanalysis.

From this description, certain difficulties with reanalysis become clear. The notion of reanalysis suggests that a new category can be created *ex nihilo* on the basis of some structural ambiguity. This is problematic, however, because it is logically impossible for an innovation to be introduced on the basis of an ambiguity that strictly speaking exists only in retrospect – that is, after the change has taken place (Fischer 1988, 2007: ch.3, p.c.; Los 2005: 117; McDaniels 2003). Put differently, the ambiguities that are supposed to motivate reanalysis are really the result of reanalysis, as they can only arise if the target structure of reanalysis already exists. If not through ambiguity, however, it is unclear how language users home in on the target of reanalysis to arrive at the innovative grammatical category. After all, how do language users obtain access to new syntactic representations that are unfamiliar to them from their existing grammars? The notion of reanalysis as a mechanism of language change thus contains both a logical flaw and an unsolved ontological issue. The logical flaw is that ambiguity cannot explain the introduction of syntactic innovations. The ontological issue is the question where innovative structural representations come from.

To see these problems more clearly, consider the development of Dutch *kei* 'boulder, pebble', which can be taken as a straightforward example of reanalysis. Originally a noun, *kei* is used in Present-Day Dutch as an intensifying prefix in adjectival derivations, such as *keimooi* 'very beautiful' or *keilang* 'very long'. The key to the change probably lies in comparative compounds combining a noun and an adjective, as in *bloedrood* 'blood-red' or *beenhard* 'bone-hard'. Among such compounds are also combinations with *kei*, for instance *keihard* 'rock-hard', which could provide a context for reanalysis. The development can thus be schematized as in Figure 2, in parallel to Figure 1 above.

[INSERT FIGURE 2 HERE]
Fig. 2. Reanalysis of Dutch *kei*.

However, reanalysis as conceived above cannot be telling the full story. It is plausible that compounds such as *keihard* played a central role in the change from the noun *kei* to the prefix. But apart from that, it is awkward to posit a stage in which *keihard* was ambiguous between two representations prior to reanalysis – if *keihard* is ambiguous now, that is *because* reanalysis took place. More fundamentally, supposing intensifying prefixes were new to Dutch, how could language users even think of assigning

this structural label to *kei*, particularly in compounds whose syntactic structure actually appears reasonably transparent?

In the case of *kei*, a number of solutions to these problems suggest themselves. Most obviously, intensifying prefixes were in fact not new to Dutch. Dutch has other prefixes and other intensifying prefixes, so the introduction of intensifying *kei* was, syntactically, not a complete innovation. It may also have helped that comparative compounds often already have an intensifying implication – *keihard* 'hard as a rock' is by implication 'very hard'. Further, the polysemy of Dutch *hard* provides a slope along which comparative semantics could get obscured rather gradually (e.g. if the metaphorical character of *hard* in *keiharde behandeling* 'extremely harsh treatment' is sufficiently vivid, *kei* can be construed as metaphorical point of comparison; but if the metaphorical character of *hard* is opaque, so is the comparison). Moreover, independently of the compound uses, the noun *kei* itself had undergone semantic developments that may have furthered the development of its intensifying function. Specifically, the fact that *kei* could be used figuratively to refer to a person who excels in something (e.g. *een kei in fysica* is 'someone extremely clever at physics'), may have facilitated the coinage of certain intensifying derivations, especially those implying excellence, as in *keigoed* ('very good') or *keisterk* ('very strong'). Finally, it is no doubt relevant that language users have a knack of recruiting new and somewhat original expressions in the domain of intensification.

If this kind of reasoning is followed through it appears, first, that although the traditional description of reanalysis does not invite us to think of this, there is much more that goes into the process of reanalysis than just the two syntactic representations involved and the syntactic ambiguities that (supposedly) arise in particular surface sequences; and, second, that much of the outcome of reanalysis is already available to the language user prior to reanalysis. In the case of Dutch *kei*, semantics and pragmatics come into play, as well as the broader linguistic system in which the change takes place. At the same time, many elements of the innovation were present prior to *kei*'s shift toward a prefixal use, including some sort of intensifying semantics and the syntactic slot for intensifying prefixes. In terms of mechanisms of change, then, the reanalysis of *kei* can be reconceived as a semantically and pragmatically motivated analogical extension of the category of intensifying prefixes into the realm of comparative *kei*-compounds, which only took place after the ground had been prepared by semantic developments in *kei* and *hard*. Taking these elements into account,

changes labelled as reanalysis become less dramatic and less spectacular but also much more complex, while the explanation of change gains considerably in realism.

This leads to the central issues of this paper. How does reanalysis work? Where does reanalysis get its innovative representations from? What does it take for reanalysis to occur? The solution to be proposed here is that the process of reanalysis, in order to be understood properly, has to be broken down into more fundamental mechanisms of language change, including (among others) analogy, as in the example of *kei*. One consequence of this solution is that reanalysis itself becomes to some extent epiphenomenal as an independent mechanism of change, if not necessarily as a type of change.

There are other solutions, however, which point to the theoretical relevance of the issue and, less directly, also serve to highlight the theoretical motivations underlying the approach chosen here. The explanatory value of syntactic reanalysis improves considerably if it is assumed, first, that language users have more syntactic representations than they actually implement in usage and, second, that there is some point when language users can select the representations they will implement from the options they have at hand. This is, loosely formulated, the view on syntactic change most famously elaborated by Lightfoot (1979) and since then upheld by generative linguists in one version or other (Newmeyer 1998; Roberts 2007; Roberts & Roussou 2003; see Andersen 2001 for an example outside the generative paradigm). This view recognizes syntactic innovations as problematic – where do language users get innovative syntactic representations from? – and solves the problem by providing language users with an innate repository of representations in the form of universal grammar and the opportunity during language acquisition to apply these to the outputs of existing grammars in the form of parameter settings. On this interpretation of syntactic change, ambiguity between an existing and a 'future' interpretation is logically possible and affords a powerful mechanism for explaining syntactic innovations. In this way, both the logical and the ontological problem of reanalysis are solved.

This train of reasoning is not followed here, however, partly because it makes unsatisfactory prior assumptions and partly because it is difficult to apply to actual instances of reanalysis. Regarding the questionable prior assumptions, it is uncertain whether language change, especially under normal circumstances, is in fact realised by children during acquisition (Aitchison 1991; Bybee & Slobin 1982a; Croft 2000; but see work on creolization or acquisition in deaf children, e.g. Bruyn 1995; Hudson

Kam & Newport 2005; Senghas & Coppola 2001; Singleton & Newport 2004). More importantly, even if children can change language, this need not mean that they do so on the basis of a universal grammar. Beyond a clear predisposition in human children to acquire language, the existence of universal grammar is controversial. It has, for example, been argued that universal grammar is typologically difficult to operationalise (Croft 2001; Newmeyer 2004), implausible from an evolutionary perspective (Christiansen & Chater 2008) and unnecessary from an acquisitional perspective (Slobin 2001; Tomasello 2006).

With respect to reanalysis as such, it is to be noted, first, that some major well-documented changes involving a category shift proceed too gradually to be convincingly described as the momentous move to a new grammar by a generation of language users or even by individual language users (Allen 1995; Plank 1984). Second, in most cases of reanalysis the source structure for change survives in its old form also after it has been reanalysed. If anything, this is evidence that children really have no difficulties acquiring the old structure, that their parents' grammar remains accessible to them, and that from a purely acquisitional point of view there appears to be no urgent reason for them to reanalyse the old structures. The least this can be taken to imply is that the generative account still cannot explain why reanalysis occurs. Third, the variation between old and new analyses that results from reanalysis and which permeates the use of individual language users is difficult to model in a generative framework (Croft 2000), the more so when categorial shift is gradual (or stepwise). Fourth, many instances of reanalysis – including the examples to be discussed below – take place on a very small scale and affect fairly isolated constructions of a language. To describe these changes as being inspired by a universal grammar would require a universal grammar with detailed specifications for a very high number of possible syntactic categories and configurations, which is exactly the version of universal grammar that is most controversial (see e.g. Newmeyer's 2004 critique of Baker 2001 and Kayne 2000).

Importantly, this criticism does not excuse non-generative approaches from addressing the problem of syntactic innovation through reanalysis. In fact, it highlights the significance of the issue. Unless they have access to a pre-existing repository of grammatical representations, implementing radically new syntactic categories in existing grammars is something language users are not expected to do. So, if it turns out that, as the traditional concept of reanalysis still implies, language users can produce

radical changes through reanalysis, introducing grammatical elements with unseen-before characteristics, this is a serious problem to approaches that work without some form of innate grammatical categories. Since major changes are an indisputable fact of language history, a clear challenge exists to explain these changes without recourse to such radical innovations.

What can accounts of language change take recourse to, then? In order to start answering that question, it is instructive to compare reanalysis to analogy. Analogy, especially in usage-based models of language, is not simply a mechanism of change, but is also put forward – explicitly or implicitly – as a principle of synchronic grammatical organisation and language use, meaning that it is part and parcel of the cognitive abilities that speakers bring to the task of interpreting, producing, and even acquiring language (see in particular usage-based models of language, such as Bybee 2006; Croft 2000, 2001; Goldberg 1995, 2006; Hopper 1987, 1988; Itkonen 2005;Langacker 1987; Tomasello 2006). In analogy language change is directly linked to language use. It is by construing analogies that speakers identify, store and reproduce the regularities they encounter in language, coin their output and parse their input. While this primarily implies that they recycle stable grammatical patterns, by the same mechanism speakers can also turn out historical innovations.

The double status of analogy – as a mechanism of change and as a strategy of language use and synchronic organisation – is what gives analogy its substance as an explanation of language change. After all, because speakers must be assumed to have no internalised rules of language change (Fischer 2000: 153, p.c.; Joseph 1992; Moder 1992), a mechanism of change that cannot be straightforwardly linked to the strategies of ordinary language use is automatically suspect. Reanalysis, by contrast, appears to show no direct correspondence to a principle of synchronic grammatical organisation, it enjoys no privileged status in synchronic model-building, and it is, consequently, confined to the realm of historical change. The only synchronic process with which diachronic reanalysis could be equated is misparsing, but it is doubtful that misparsing could be an independent strategy of language use – rather, misparsing can be expected to arise through application of the same strategies as are employed in correct parsing. In this way, the equation of reanalysis to misparsing ultimately supports the reductive approach to reanalysis taken here, which consists in breaking down reanalysis into more fundamental mechanisms of change. What must give these alternative mecha-

nisms their credibility (apart from their applicability to the actual historical record) is their direct link to synchronic usage and grammatical organization.

To show that the reductive approach advocated here can be made to work on actual historical data and to explore what mechanisms may underlie reanalysis, the rest of this paper is devoted to examining two particular instances of change showing the superficial features of reanalysis. One is the historical development undergone by gerund constructions with *worth* and *worthwhile*. The other is the development of *for…to*-infinitives, often cited as a prime example of reanalysis. As will be shown, these changes can be understood in terms of various more basic mechanisms, involving analogy and gradual semantic change. Furthermore, looking at the details of each change, there is evidence in support of these more basic mechanisms, not simply as theoretical constructs but as realistic alternatives to reanalysis. The rest of this paper is structured as follows. The two case-studies are tackled in Sections 2 and 3 respectively, with the aim of showing that alternative scenarios of change are, first, applicable to actual changes, and, second, preferable to an account in terms of reanalysis as traditionally conceived. The findings are then summarized and discussed in Section 4, with the goal of distilling a number of mechanisms that can conspire to produce the same outcome as reanalysis, but are more firmly grounded in usage-based models of language and language change. In the concluding remarks in Section 5, the position of reanalysis in a theory of language change is reconsidered.

2. The development of gerundial constructions with *worth* and *worthwhile*

The changes affecting the adjectives *worth* and *worthwhile* have gone largely unnoticed in the literature. Section 2.1 therefore devotes some attention to the syntactic patterns involved and the changes they underwent. Section 2.2 then addresses the underlying mechanisms of change.

2.1. The changes

The changes at hand involve the shift from a transitive to an intransitive use for *worth*, and the shift from an intransitive use to what looks like a transitive use for *worthwhile*. These changes are reflected in the layered synchronic patterning of both

adjectives. On the whole, *worth* can be described as a 'transitive' adjective,[1] which means that it selects a subject and an object (loosely defined), as is illustrated in (1). Corresponding to the syntactic roles of subject and object are the semantic roles of that which is valued (the subject) and the value (the object), between which a relation of fair or profitable exchangeability is predicated. Note here that omission of the object is clearly ungrammatical (**a touchdown is worth*; **the outcome had been worth*).

(1) a. A touchdown is *worth* six points. (CB)
b. the outcome had been *worth* the long battle. (CB)

When *worth* takes a gerund clause as its object, the syntax gets more complicated because the subject of *worth* controls a secondary participant of the gerund clause, the controlled participant 'appearing' in the gerund clause as a missing object (2a) or as the gap following a stranded preposition (2b). Still, the relation expressed by the adjectival predicate can be interpreted in the same way as when *worth* is used with an ordinary object: the subject (*the restaurant*; *this heroic lover*) is now valued in relation to an activity, typically with the effort that activity requires (*visiting*; *running after*) as implied 'currency'.

(2) a. the restaurant was crook and therefore not *worth* visiting. (CB)
b. Now was not this heroic lover *worth* running after? (1742, CLMETEV)

What is unexpected are instances as those in (3): the structure in which *worth* is attested has only one participant, an extraposed gerund clause (*emigrating*; *issuing a word of warning about unusual vegetables*).[2, 3] Syntactically, *worth* now seems to be-

[1] This is of course unusual for English, and *worth* has been alternatively analysed as a preposition (Maling 1983). Unlike other prepositions, however, *worth* is not used to introduce adverbial phrases, and, like adjectives, *worth* still has comparative and superlative uses with *more* and *most* and is even occasionally modified by *very* and other intensifiers (e.g. *another winter salad very worth growing* (CB)). In their reference grammar, Quirk *et al*. (1985) seem to be undecided as to whether *worth* is an adjective (as implied in 16.83) or a preposition (as implied in 9.8). Huddleston & Pullum (2002: 607), by contrast, are convinced *worth* is an adjective rather than a preposition.

[2] The examples in (3) are obviously hard to analyse syntactically. Hantson (1987: 264-5) feels compelled to postulate a unique movement rule to accommodate the pattern. Further, the referential status of dummy-*it* in extraposition structures remains a disputed issue. According to Kaltenböck (2003), *it* could still be viewed as a participant with maximally general reference. This would nicely suit an analysis of *worth* as consistently transitive but would of course complicate the analysis of other extraposition structures with intransitive adjectives. I believe this analytical dilemma is one manifestation of the slippery slope on which transitive *worth* finds itself, as will be argued in section 2.2 below.

have like other intransitive adjectives (for instance, *easy* in *it hadn't been easy breaking the news to Nicole* (CB)), while semantically, the gerund clause following *worth* no longer specifies an exchange value for a given subject, but is itself implicitly valued as being 'of positive value, worthwhile'. Accordingly, the use of *worth* in examples as in (3) can be characterised as intransitive – even if some intransitive operations are clearly disallowed (e.g. fronting of the gerund clause, as in **emigrating is worth with anthems like that, isn't it*). As will be shown below, historically, incongruous instances of the type illustrated in (3) represent an innovation.

(3) a. With anthems like that it's *worth* emigrating isn't it. (CB)
b. However, I think it is *worth* issuing a word of warning about unusual vegetables (CB)

The adjective *worthwhile* shows a roughly similar discrepancy in its use, although here change can be assumed to have followed the opposite direction. *Worthwhile* is an intransitive adjective as the examples in (4), with their single participant, illustrate. This state of affairs makes sense historically: as *worthwhile* derives from the semi-fixed phrase *worth one's while*, an object is already incorporated morphologically and semantically, and thereby pre-empted syntactically. Apart from being intransitive, *worthwhile* also differs from *worth*, in that it can be used both predicatively (*the investment is worthwhile*) and attributively (*a worthwhile investment*).

(4) a. all the work has been *worthwhile* (CB)
b. Hardly any novel writing, or reading, seemed to him *worth while*. (1894, CLMETEV)

In light of *worthwhile*'s intransitivity, there is nothing very remarkable about structures with extraposed gerund clauses, as illustrated in (5): *worthwhile* is used like other adjectives such as *difficult*, *funny*, *great*, etc. More problematic are the examples in (6), where *worthwhile* appears to take the same construction type as does *worth* in (2) above, with the subject (*a shadow*; *that*) simultaneously functioning as the missing

[3] It has been questioned whether gerunds can in fact extrapose (e.g. Quirk *et al.* 1985). I use the term for convenience here. Whether the examples are treated as true instances of extraposition or not makes no great difference to the analysis of *worth*, which must still be recognised to display both a transitive and an intransitive use.

object of the gerund clause following the adjective. Although more can be said on the precise analysis of the pattern (see below), the close resemblance to the transitive uses of *worth* will for now justify referring to it as the transitive use of *worthwhile*. The most important thing to note is that a similar transitive use is not allowed for any other intransitive adjectives (cf. **the news hadn't been easy breaking to Nicole*). Again, historically, instances of the type exemplified in (6) represent an innovation.

(5) a. it is certainly *worthwhile* stopping off on the way. (CB)

b. Sir William does not think it *worth while* making another application. (1813, CLMETEV)

(6) a. no more than a shadow too vain and futile to be *worth while* watching as it passed. (1900, CEN)

b. there is much that is *worthwhile* visiting (CB)

Before turning to the mechanisms that underlie the introduction of intransitive *worth* and transitive *worthwhile*, it is important to establish as precisely as possible the sequence of events leading up to the innovations.[4] The emergence of gerund clauses with *worth* figures against the background of the more general diffusion of gerund clauses during the Modern period (cf. De Smet 2008a; Fanego 1996; Visser 1963-73). Gerund constructions with *worth* appear in the second half of the sixteenth century. The first instances have a definite article introducing the gerund, as in example (7a), but soon gerund forms appear without the article, as in (7b). As both (7a-b) indicate, the early instances already show the control relationship between the main clause subject and the implicit patient of the gerund that is also characteristic of later gerund clauses with transitive *worth*. At the same time, it should be pointed out that the clausal status of the earliest gerunds is disputable: none of the gerund forms are accompanied by modifiers that could betray their clausal nature (e.g. an adverb or an indirect object), and the apparent control relationship between the main clause subject and the gerund's implicit patient cannot count as an argument, since the same interpretative schema is found in constructions with action nominals, which are undoubtedly

[4] The corpora used are described in the Appendix. Apart from the Middle English corpora, all the material has been searched systematically for any strings containing *worth* or *worthwhile* (only in the large corpora, CEN and CB, has this query been somewhat restricted by looking for *worth* or *worthwhile* followed within a space of four words by a word ending in *-ing* or tagged VBG (i.e. verbal *-ing*-form); CB, moreover, has been randomly sampled at 50%).

non-clausal – for instance, *relasion* in (7c).[5] Unambiguously clausal gerund constructions do not appear with *worth* until the end of the seventeenth century, as is illustrated in (7d).

(7) a. and yf their women haue any thing about them, as apparell or lynnen, that is *worth* the selling, they laye the same to gage [i.e. 'they pawn it'], or sell it out right (1567-8, PPCEME)

b. they haue left nothing here but short riggle-tayle-Comfits [i.e. 'wriggling sweetmeats'], not *worth* mouthing (1620, PPCEME)

c. heare is no nues [i.e. 'news'] *worth* the relasion at this time (1634-7, PPCEME)

d. Neither is the Linnen Manufacture in England a matter *worth* taking notice of whatever a few Gentlemens opinion are (1681, LC)

It bears pointing out that the emergence of gerund clauses with *worth* may not have been an entirely language-internal affair. Sixteenth and especially seventeenth-century French has a construction with the verb *valoir* ('be worth') that is very reminiscent of the English pattern with *worth* and a gerund introduced by the definite article. As the French examples in (8) show, *valoir* could combine with a nominalised infinitive (*demander*; *tirer*), also introduced by a definite article (*le*), and also implying a patient controlled by the subject of the main clause.

(8) a. La belle faict bien de garder Ce qui *vaut* bien le demander. (16th c. *Dictionnaire de la langue française du seizième siècle*) ['The beauty does well to keep what is well worth the asking']

b. Ce récit ennuyeux de ma triste langueur, Mon Prince, ne *vaut* pas le tirer en longueur (1632, BTF) ['The tedious story of my sad lassitude, My Prince, is not worth the drawing out at length']

However, of greater interest to present purposes is of course the appearance of intransitive *worth*. Instances of intransitive *worth* turn up soon after the introduction

[5] Arguably, control relations are primarily interpretative (i.e. pragmatic) relations that may become syntacticized in some environments (see De Smet 2008b). In this view, control is not precluded by the non-clausal nature of the early gerunds or action nominals with *worth*.

of gerunds with *worth*. The earliest example is given in (9a), drawn from the *Diary* of Samuel Pepys;[6] the following example attested is rendered in (9b).

(9) a. But it is *worth* considering the ill state a Minister of State is in, under such a Prince as ours is (1667, Samuel Pepys, *The diary of Samuel Pepys* (Project Gutenberg))[7]

b. Surely, then, it is *worth* paying some regard to the principles of fitness and consistency, in order to avoid the consequences necessarily resulting from every striking deviation from these rules (1839, CLMETEV)

One fact to be added to this is that the history of intransitive *worth* is marked by a long period of sporadic occurrence (as witnessed by the time-lag between (9a) and (9b)), followed by a sudden surge in frequency halfway the twentieth century. The S-shaped pattern of change is well reflected in the frequency curve depicted in Figure 3, based on the frequency of intransitive *worth* in CEMET, PPCEME, and LC for 1640-1710, CLMETEV for 1710-1780, LOB for 1961 and FLOB for the early 1990s. The very low frequency of intransitive *worth* in the period 1850-1920 is further confirmed by the data from CEN, evidencing some 11 examples, or 0.4 instances per million words, while figures from CB confirm the sharp rise of the pattern in the twentieth century, with 12.2 instances per million words (see the Appendix and footnote 4 for details on the corpora and the search methods used). Whether or not the S-curve in Figure 3 has in fact levelled out in the second half of the twentieth century, as is sug-

[6] The example from Pepys in (9a) may not be a genuine instance of intransitive *worth*: if *it* is not a dummy-*it* but refers cataphorically to *the ill state a Minister of State is in* (with an intonation break between *considering* and *the ill state*), (9a) still instantiates transitive *worth*. The only other example in Pepys, given in (i), is somewhat problematic as well, since *the silliness of the quarrell* must be the understood subject of the following clause (*is a kind of emblem* etc.), whereby the possibility of subject ellipsis suggests that *the silliness of the quarrell* might be the subject of the preceding clause (*it is worth remembering*) as well.

(i) Here Creed did tell us the story of the dwell [i.e. 'duel'] last night, in Conventgarden, between Sir H. Bellasses and Tom Porter. It is worth *remembering* the silliness of the quarrell, and is a kind of emblem of the general complexion of this whole kingdom at present. (1667, PEPYS)

If none of the examples in Pepys' *Diary* turn out to be genuine instances of intransitive *worth*, however, intransitive *worth* is a nineteenth-century innovation, which would only reinforce the view developed below that the emergence of intransitive *worth* is due to semantic analogy with *worthwhile*.

[7] Samuel Pepys's *Diary* is only partly extracted in the corpora used for the same period (1640-1710) in this paper. The example in (8a) is in fact attested outside these corpora. However, the full text of the *Diary* can be found on the Project Gutenberg website.

gested by the FLOB data, is difficult to ascertain – the frequency for intransitive *worth* in CB is higher than in LOB, but not significantly so.[8] What is beyond doubt is that the dramatic increase in the pattern's use began sometime during the first half of the twentieth century, between the period represented by the CLMETEV and CEN, and that represented by LOB.

[INSERT FIGURE 3 HERE]

Fig. 3. Frequency of intransitive *worth* over time (frequencies per million words).

As indicated earlier, the history of *worthwhile* runs in the opposite direction: from intransitive to (seemingly) transitive uses. The history of *worthwhile* starts with the fixed phrase *worth one's while*. The latter expression is current as early as the seventeenth century, when it is typically used in combination with a *to*-infinitive, as in (10a). As is illustrated in (10b), alongside the pattern with a possessive or genitive preceding *while*, seventeenth-century English also has the pattern with *while* immediately following *worth* – though still, apparently, as a separate word. How the possessive or genitive came to be dropped is an interesting question in itself, since *while* is originally a count noun that would not normally occur without a determiner. Another – though perhaps more trivial – question is when *worth while* came to be interpreted as a single word. Neither of these issues need to be dealt with here, however.[9]

(10) a. but yet I thinke it *worth our while* to seeke the ways and practise them when found (1685, PPCEME)

b. Sir, I fancy 'tis not *worth while* to trouble Sir John upon this impertinent Fellow's desire (1696, PPCEME)

[8] Significance of changes is here calculated by carrying out a Fisher's exact test on absolute frequencies compared to corpus size. For intransitive *worth*, the difference in frequency between LOB and the third sub-period of CLMETEV is significant at $p < 0.0001$.

[9] A solution to the problem of getting from *worth one's while* to *worth while* may lie in other nominal objects found with *worth*: it is a fact of seventeenth-century usage that the sequence '*worth* + possessive pronoun' is almost exclusively followed by uncount nouns, most of which could also appear with *worth* without a preceding possessive pronoun. Among these nouns are *anger*, *care*, *consideration*, *curiosity*, *labour*, *money*, *patience*, *strife*, *time*, *trouble*, and so on. The (two-word) sequence *worth while* could in that respect be an instance of levelling, with *while* being interpreted as an uncount noun, in accordance with the other nominal objects found with *worth*. Evidence that *while* is or was at any point in time really considered an uncount noun is not available, however, except perhaps in another marginal construction: *some while ago*.

More relevant is the use of *worthwhile* with gerund clauses. The earliest attestation of *worthwhile* in an extraposition construction dates from the beginning of the nineteenth century and is given in (11a). This new use is soon followed by instances of transitive *worthwhile*. The oldest instance is given in (11b) and dates from the end of the nineteenth century.

(11) a. Sir William does not think it *worth while* making another application (1813, CLMETEV)

b. They fear in many cases he takes the refuse in order to have the opportunity of finding something which may be *worth while* "picking up," (1890, CLMETEV)

2.2. The mechanisms

The changes in *worth* and *worthwhile* look like self-evident examples of reanalysis, in that the innovative uses could develop through ambiguous instances of the source constructions. For *worth*, these ambiguous instances are primarily of the type illustrated in (12), where dummy-*it* can either be interpreted as the dummy of an extraposed *that*-clause, as formalised in (12)', or the dummy of an extraposed gerund clause, as in (12)". In the former case, *worth* is transitive: the gerund clause functions as object of *worth*, while the *that*-clause provides both the subject of *worth* and the object of the gerund. In the latter case, *worth* is intransitive, since its only argument is the gerund clause.

(12) The value of the studentship is slightly under £200 a year. It is *worth* noticing that persons of both sexes are received as candidates. (1883, CLMETEV)

(12)' It_i is worth noticing [that persons of both sexes are received as candidates]$_i$

(12)" It_i is worth [noticing that persons of both sexes are received as candidates]$_i$

A different but less recurrent type of ambiguity is illustrated in (13). Here the ambiguity depends on the interpretation of the verb in the gerund clause and its consequences for the interpretation of the *it*-subject of the main clause. If the gerundial verb (*trying* in (13)) is transitive, its object must be controlled by the subject of the matrix clause,

which means that the *it* that fills the main clause's subject position must be referential. If the verb is intransitive, the requirement of object control is dropped and the *it* in the higher clause can be a dummy for the gerund clause, yielding an intransitive reading for *worth*. These alternative interpretations are formalised in (13)' and (13)".

(13) yet as I found that the quarrel had been accidental, and the offence unpremeditated, I thought it not absolutely impossible that an expeditious mediation might effect a compromise: at least it was *worth* trying (1782, CLMETEV)

(13)' at least it_i was worth trying $Ø_i$

(13)" at least it_i was worth $[trying]_i$

Worthwhile again presents us with a mirror image of *worth*. We find the same ambiguities, but reanalysis worked in the opposite direction. The example in (14a) suggests the same ambiguity as (12) above, with dummy-*it* either anticipating the gerund clause or the *that*-clause. The example in (14b) parallels (13) above, with subject-*it* being either a dummy, and the gerund *telling* an intransitive verb, or with *it* being a referential pronoun, controlling the missing object of transitive *telling*. Thus, the examples in (14) provide the environment where *worthwhile* could switch from its old intransitive interpretation to a new transitive reading.

(14) a. It would be *worth while* remembering, when he had gone, that he had been gentle with her (1900, CEN)

b. "And then--" here Tommy hesitated--"well, it's *worth while* telling. There was a girl who had gone wrong, and had been brought back." (1904, CEN)

Especially for *worth*, the ambiguous sequences are well-represented in the corpus material. Figure 4 shows the frequency of intransitive *worth* over time, along with the frequency of *worth* in ambiguous sequences. The Figure reveals that ambiguous sequences appeared from the moment *worth* began to combine with gerund clauses – witness (15a) – although it is of course impossible to ascertain whether these uses were felt as being ambiguous from the start. Note simply that the assumedly original reading is well-supported by further evidence, as demonstrated by (15b-d): (15b-c) shows instances whose only possible interpretation involves extraposition of the

whether-clause, as the complement of *worth* is not a gerund clause but an ordinary noun phrase (*enquiry*; *our consideration*). (15d) shows that the clause functioning as object complement of the gerund could be fronted into subject position, indicating that the (transitive) interpretation of such clauses as subjects of *worth* was available.

(15) a. and it is *worth* considering how unsafe it is to have children play up and down this lewd town (1667, PPCEME)
b. It is *worth* Enquiry, whether the Prospect of this Business is not so much to remedy old Inconveniencies, as to introduce new (1694, LC)
c. and therefore it is *worth* our consideration, whether active power be not the proper attribute of spirits, and passive power of matter. (1689, CEMET)
d. Now whether the cause of this difference was negligence in accounts, or the greaterness of the families, &c., is *worth* inquiring. (1682-7, CEMET)

Figure 4 also shows that the number of ambiguous patterns increases along with the sharp rise in the frequency of intransitive *worth* after 1920. However, the evidence fails to indicate a possible precedence of the rise in ambiguous *worth* over the rise in intransitive *worth*, which also means that no causal relation can be gauged from these quantitative data. The rise in ambiguous *worth* after 1920 might just as well be a consequence as a cause with respect to the emergence of intransitive *worth*.

[INSERT FIGURE 4 HERE]
Fig. 4. Frequency of intransitive and ambiguous *worth* over time (frequencies per million words).

The role of ambiguous sequences in the development of *worthwhile* is somewhat problematic even at first sight, as such ambiguous sequences are marginal at best. The whole CLMETEV corpus contains only a single instance of *worthwhile* with a gerund that is structurally ambiguous between an intransitive and a transitive reading, while no more than four such instances are found in CEN (see (14) above). Of these, the only example that predates the earliest unambiguous instance of transitive *worthwhile* ((11b) above) does so by only one year. The absence of evidence is no strong counter-evidence, however, so it remains easy to conceive of the changes affecting *worth* as

well as *worthwhile* as instances of reanalysis triggered by ambiguity. There are two discrete structural representations and there are surface sequences that appear to be ambiguous between either representation to bridge the syntactic gap.

That said, it will now be argued that reanalysis, as traditionally conceived, cannot account for everything that happened to *worth* and *worthwhile*, and that the changes at hand can and should be understood in terms of more fundamental underlying mechanisms. To begin with, the constructions involved are likely to have undergone subtle semantic alterations that facilitated the subsequent shifts in transitivity. Arguably, these semantic changes are small enough not to radically disrupt categorial boundaries and can instead be seen as examples of fairly gradual semantic extension. In particular, there are a number of mechanisms that have been eating away at the transitive semantics of *worth*.

The primary use of *worth* is to predicate a relationship of valuation: a subject and an object stand in a relationship of fair or even profitable exchangeability. For example, (16a) states that it is profitable to exchange the favour of the large number of bad men for the favour of the smaller number of good men. When *worth* combines with a gerund (or action nominal), the value of the subject comes to be understood in terms of an activity and must be measured in terms of the cost and effort that that activity approximately requires. For instance, (16b) values a piece of news in terms of the effort that would be spent in writing it down, while (16c) values pearls and stones in terms of the effort required to dig them up.

(16) a. Deare Ned, the Lord in heauen blles you, and giue you that principell of gras, […] that you may growe in gras, and so haue the fauor of your God, which is better then life, and the fauor of good men, which small number is *worth* all the millions of men besides. (1638, PPCEME)

b. I doe not heare of any newes *worth* the wrighting at this time. (1628-30, PPCEME)

c. But yet grave Paul him nowhere did forbid The use of parables; in which lay hid That gold, those pearls, and precious stones that were *Worth* digging for, and that with greatest care. (1678-84, CEMET)

However, a semantic characterisation along these lines is not applicable to all instances of *worth* with a gerund, which in the course of the Modern period have

come to deviate semantically from other uses of *worth*. In the Late Modern and Present-Day English examples in (17), *worth* no longer assigns a particular value to its subject; instead, it designates the activity or situation expressed by the gerund clause as profitable – note that paraphrases with an intransitive construction are certainly not far-fetched (e.g. *it is worth doing that* for (17a), or *it was well worth taking the risks* for (17c)). At the same time, a remnant of *worth*'s original meaning lives on in the positive evaluation that is often simultaneously attributed to the subject of *worth* (the plan to be carried out in (17a) is a good plan; the victims in (17b) are good victims for robbing; and so on). In some present-day examples this trace of *worth*'s original transitive semantics has become more subtle: the subject of *worth* is merely presented as the most prominent factor in the valuation of the overall event designated by the gerund clause (e.g. it is the inherent value of the rights in (17d) or the nature of the costs in (17e) that determines whether they can be profitably violated or paid).

(17) a. "Let us write to Mr. Bast as soon as ever we get home, and tell him to clear out of it at once." "Do; yes, that's *worth* doing. Let us." (1910, CLMETEV)

b. It has been said of him that he never made a mistake, that the plunder he took was always large. His victims, too, were always those who had bad reputations; and, one thing more, Mistress Lanison, his victims have always won largely at Aylingford Abbey. […] He knew when they were *worth* robbing. (1910, CLMETEV)

c. The arena was suddenly that much bigger, and we were a little more naked in it, but the risks were well *worth* taking. (CB)

d. whose rights are *worth* compromising: drug dealers, murderers, child-molesters corrupt police, politicians? (CB)

e. If we do not consider that the costs are *worth* paying, then we must frankly acknowledge the human implications that some children will die to preserve the freedom of others. (CB)

The semantic changes in *worth* do not represent an isolated development. Two parallels can be drawn to other phenomena. First, the semantic development of *worth* in its syntactically transitive use can be likened to changes affecting main verbs with sentential complements. There is a general (and very well-documented) tendency for

main verbs and sentential complements to turn into auxiliaries and main clause predicates respectively (Bolinger 1980; Heine 1993). The examples in (17) of *worth* and its gerundial complements reveal a similar shift in semantic relations in as far as the original main clause predicate, *worth*, becomes 'transparent', its scope increasing to include its erstwhile subject. The change differs from ordinary auxiliation, however, in that the new scope of *worth* does not encompass an entire proposition but rather a clausal structure whose subject remains unspecified and generic. This is due to the unusual control properties of the original construction, where the syntactic subject of *worth* provides the object of the gerund clause.

Second, the new uses of transitive *worth* are comparable to the infinitival 'tough-movement' construction illustrated in (18) – as opposed to the 'unmoved' pattern in (18)'. Both (18) and (18)' mean that reading a particular version of the Bible is hard, yet the first pattern more strongly suggests that this is due to characteristics of the Bible version itself (Bolinger 1961: 373; Huddleston & Pullum 2002: 1248). Similarly so, it was pointed out above that the subject in transitive *worth* constructions continues to be presented as a value-carrying participant, even when it is no longer the function of the gerund clause to specify that value. This semantic characterisation is in turn reminiscent of the 'conduciveness' attributed to the subjects of middle voice constructions (*the new Bible reads more easily*), which have the same distinguishing characteristic of somehow promoting a patient argument to subject position in an otherwise active sentence (Olivier & Davidse 2004). On these grounds, the examples in (17) above can be seen to convey a 'medial' meaning, combining semantic traits from the (syntactically) transitive and intransitive patterns.

(18) Of those who had read the Bible, 36 per cent found their current Bible was *hard* to read. (CB)

(18)' 36 per cent found it was hard to read their current Bible.

The new medial meaning of transitive *worth* can be traced back to a pragmatic implicature. Constructions with transitive *worth* and a gerund clause typically imply that the activity denoted by the gerund is itself a valuable way of spending one's time and energy. This is due to conversational practices on the one hand, and the syntax of *worth* on the other. Thus, we tend to value items that we think are valuable (cf. (1a-b) and (16a) above). At the same time, there is the redundancy introduced in the transi-

tive pattern as a result of the identity between the subject of *worth* and the object of the gerund clause. This redundancy allows valued and value to be integrated in one proposition, providing a single unified target for the speaker's positive attitudes. Returning to the examples in (16) above, (16b) implies (negatively) that it is not worth one's time to write down the available pieces of news, while (16c) implies that it would be profitable to dig up particular precious stones. The moment this pragmatic implicature becomes semanticised (in the sense of Traugott & König 1991), *worth* undergoes a semantic shift towards a medial meaning.

The watering down of transitive semantics in *worth* has been further aided by the very specific discourse properties of *worth*, which are apparent from the very moment *worth* began to combine with gerunds. Particularly, speakers using *worth* tend to understate the value of *worth*'s subject. This practice is present in some uses of *worth* without a gerund (cf. (16a) above), but when *worth* is used with a gerund the tendency becomes more pronounced. In (19a-b) the subject of *worth* is still valued positively, but we would (grossly) underestimate its real value if we took it to match the effort required by the activity of the gerund. Value-understatement has a persuasive effect and can be exploited rhetorically to remind the addressee of the minor effort that needs to be invested in the action denoted by the gerund clause and its comparatively high gain. The long-term effect of systematic understatement, however, is that the function of *worth* comes to be less clearly perceived as predicating a value to a subject (the transitive meaning).

(19) a. remember you have a noble wife, companion of your vows, and I have honour, both which are *worth* preserving (1684, CEMET)

b. the front is uniforme and very handsome with towers but there is no good rooms but a long gallery thats *worth* seeing. (1698, CEMET)

In addition, the tendency for understatement is reinforced by the recurrent use of *worth* with the gerund in negative environments.[10] For example, in (20a), an accident is described as *not worth mentioning*; while in (20b) a life is described as *scarce worth giving*. The negative pattern is similarly motivated by its expressiveness: an

[10] In 17th-century usage, examples featuring some negative element with scope over *worth* account for about 39% of all instances of transitive (or ambiguous) *worth* with a gerund (i.e. 18 out of 46 instances, based on a count in the period 1640-1710 in PPCEME, CLMET and LC).

event is unimportant indeed if it is not even worth the minimal effort of mentioning it; and so is a life if it is valued lower than its loss. In this respect, many affirmative uses of *worth* are primarily meaningful because they contrast with the negative examples, not because they attribute an accurate value to the subject of *worth*.[11]

(20) a. At my coming to his House an accident fell out not *worth* mentioning, but that some have made a story of it. (1680, PPCEME)

b. I'm only troubled, The life I bear is worn to such a rag, 'Tis scarce *worth* giving. (1678, CEMET)

In the end, what is left is the medial meaning described above, which no longer specifies the value of X as proportionate to the investment of time or energy required by doing Y, but signals that X is valuable and that in light of the value of X doing Y is also valuable. Note that this new semantic element ('Y is valuable due to X') comes very close to the meaning of subsequent intransitive uses ('Z is valuable').

We can also see now that it is due to the medial semantics of transitive *worth* that in ambiguous examples the syntactically transitive and intransitive readings are semantically so similar. This is illustrated in example (12) – discussed above and repeated here:

(12) […] It is *worth* noticing that persons of both sexes are received as candidates (1883, CLMETEV)

On the medial reading, the fact *that persons of both sexes are received as candidates* is presented as inherently valuable, but so is the action of *noticing that persons of both sexes are received as candidates*. In this last facet of its meaning, the syntactically transitive pattern incorporates an interpretation identical to that of an intransitive construction, and it is this second element of the interpretation that is left on the syntactically intransitive reading of the example.

These semantic developments are relevant to *worthwhile* as well. In particular, the fact that the meaning of the syntactically transitive use of *worth* has come to re-

[11] Oddly enough, as language users come to expect *worth* to predicate underestimated values, the negative pattern only becomes more expressive ('X is not worth a value Y that is underestimated anyway'), which feeds back into the further 'devaluation' of the object of *worth* in affirmative contexts.

semble the meaning of an intransitive pattern suggests that what looks like a transitive construction for *worthwhile* need not be radically different semantically from *worthwhile*'s usual intransitive pattern. Indeed, much like the transitive constructions of *worth*, the new transitive uses of *worthwhile* have medial meanings. This means that the new constructions imply their own intransitive paraphrases – compare *think a few common soldiers worth while making a stir about* in (21a) with *think it worthwhile making a stir about a few common soldiers*, or *it would not be worthwhile going into* in (21b) with *it would not be worthwhile going into it*.

(21) a. Presently, however, rain began to fall and they melted away, wondering, not too happily, whether, in that time of daily slaughter, the Duke of Alva would think a few common soldiers *worth while* making a stir about. (1901, CEN)

b. "I never know what you mean," she said almost wistfully. "Neither do I," was his amiable response. "And I am sure it would not be *worth while* going into." (1922, CEN)

This is not to say that the semantics of syntactically transitive and intransitive constructions are identical. The constructions carry meaning of their own in that different participants are attributed lower or greater textual prominence depending on the construction used. Moreover, the syntactically transitive use of *worthwhile* – like the transitive use of *worth* – carries a positive evaluation of *worthwhile*'s subject along with the positive evaluation of the action denoted by the gerund. However, the shift from an intransitive to a transitive construction is primarily a matter of highlighting different shades of meaning already present in either construction type. In other words, the semantic gap is easy to bridge.

Now, while semantic change as such did not introduce intransitive *worth* or transitive *worthwhile*, it set the stage for the changes to come. It is evident from the foregoing discussion that the four syntactic patterns under scrutiny – transitive and intransitive *worth*, transitive and intransitive *worthwhile* – are in semantic terms not all that different, which brings us to the role of analogy. We can speculate that transitive *worth* provided an analog for the innovative transitive use of *worthwhile*, while the new intransitive use of *worth* may have been modelled on intransitive *worthwhile*. There is good evidence supporting the first assumption; the second will need to be

qualified but retains a good degree of plausibility. For clarity, the hypothesised historical cross-over of constructional behaviour is schematised in Figure 5, with the alternative explanation that only invokes the traditional concept of reanalysis marked in interrupted lines.

[INSERT FIGURE 5 HERE]

Fig. 5. Schematic representation of the hypothesised development of *worth* and *worthwhile*.

Let us first look at the influence of transitive *worth* on *worthwhile*. At the time *worthwhile* began to combine with extraposed gerund clauses – a use still in line with its status as an intransitive adjective and prefigured by its use with extraposed *to*-infinitives (see Section 2.1 above) – the transitive *worth*-construction allowed a medial interpretation that was not incompatible with the semantics of *worthwhile*. The subsequent use of *worthwhile* in the transitive pattern can therefore be seen as an instance of analogical extension of the transitive pattern – or, put differently, the transitive construction simply recruited a new lexical item. That transitive *worth* played some part in the emergence of transitive *worthwhile* is plausible from the fact that ambiguous sequences with *worthwhile* may have been too infrequent to trigger the change independently (see above), and that other adjectives occurring with extraposed gerund clauses as yet did not undergo a similar shift towards transitive uses, despite the availability of potentially ambiguous sequences that could give rise to reanalysis. Such potentially ambiguous sequences are illustrated in (22); that these sequences did not trigger new transitive uses is shown by the ungrammaticality of the sentences in (22)':

(22) a. it's very *interesting* noting here that erm you were brought up in Burton-on-Trent (CB)

b. It was very *difficult* deciding whether these are a beanbag or a ball. (CB)

c. Of course, it is not *easy* knowing how many mourners will appear to toast your memory. (CB)

d. It is *hopeless* trying to get him to give any definite dates for anything. (CB)

(22)' a. *one thing is very interesting noting

b. *the question was very difficult deciding

c. *the number of mourners is not easy knowing

d. *that is hopeless trying

Consequently, that *worthwhile* appears in a transitive use, is more easily explained by analogical attraction to transitive *worth* than by reanalysis of ambiguous sequences. Or – put more carefully – if some ambiguous sequences were assigned a syntactically transitive interpretation, this happened on the model of transitive *worth*, and only those ambiguous sequences were affected that semantically closely resembled the analogical model.

As for the intransitive uses of *worth*, it is clear that the existence of intransitive *worthwhile* cannot have been the only cause of change, since intransitive *worth* already occurred before the appearance of intransitive *worthwhile* (but see footnote 6). This is not to say that there was no analogue available for intransitive *worth*. The early occurrences of intransitive *worth* could have been modelled on the extraposition constructions with other adjectives already occurring at the time, as illustrated in (23).

(23) a. in the mean time it is *best* consulting Merchants and Seamen of most fame for honesty, ability, and publick-heartedness, who can give you an account of the state of our several Trades abroad (1659, LC)

b. When it is come thus far, it is *hard* untwisting the Knot (1673, PPCEME)

c. Then I thought that it is *easier* going out of the way, when we are in, than going in when we are out. (1678-84, CEMET)

Still, it is useful to reconsider the emergence of intransitive *worth* in light of the question of analogical interference and, more specifically, the possible role of intransitive *worthwhile*. Although interference with *worthwhile* could not have been responsible for the earliest sporadic instances of intransitive *worth*, it may account for the sudden surge in frequency of intransitive *worth* after 1920. The evidence indicates that this is in fact so. For one thing, the surge in frequency of intransitive *worth* follows very closely – probably within fifty years – on the first significant rise in frequency of intransitive *worthwhile*. This is shown in Figure 6, which reveals a modest but significant increase in the frequency of intransitive *worthwhile* between the periods 1780-1850 and 1850-1920 – just prior to the dramatic increase in frequency for

intransitive *worth*.[12] Note, moreover, that the figures for 1961 indicate a continuation of the rise of intransitive *worthwhile*,[13] suggesting an S-curve parallel to that of intransitive *worth*, but slightly preceding the latter in time. The subsequent drop in frequency for intransitive *worthwhile* in the last decades of the twentieth century might be due to competition with intransitive *worth*, which, after all, conveys much the same meaning.[14] What this suggests, of course, is that the post-1920 increase in frequency of intransitive *worth* was triggered by intransitive *worthwhile*.

[INSERT FIGURE 6 HERE]

Fig. 6. Frequency of intransitive *worth* and intransitive *worthwhile* over time (frequencies per million words).

A further finding suggestive of analogy between intransitive *worth* and intransitive *worthwhile* comes from a comparison between British and American English. In particular, the geographical distribution of intransitive *worth* matches the geographical distribution of intransitive *worthwhile*. Observe first that intransitive *worth* is less frequent in American English than in British English. This is suggested by a comparison between LOB and FLOB on the one hand and BROWN and FROWN on the other. Together, LOB and FLOB, representing British English, contain 15 instances of intransitive *worth*; BROWN and FROWN, representing American English, contain only 5. Interestingly, now, a similar geographic distribution can be observed for intransitive *worthwhile*, which is relatively frequent in British English (with 7 instances in LOB and FLOB) but largely absent in American English (no instances in BROWN or FROWN). As is demonstrated in Table 1, this state of affairs is confirmed by the figures obtained by comparing the ukbooks and usbooks sections of CB.[15, 16] The Ta-

[12] Again, significance has been calculated using a Fisher's exact test. For the transition from the second to the third sub-period in CLMETEV, the difference between the respective frequencies of *worthwhile* (1 and 10 instances respectively) lies at $p < 0.05$. Somewhat more convincingly, perhaps, if the figures for the second sub-period of CLMETEV are compared to those for CEN (containing 52 instances of intransitive *worth*), the change is significant at $p < 0.001$.

[13] The difference between the 52 instances of CEN and the 6 instances of LOB is significant at $p < 0.01$, that between the figures for LOB and the third sub-period of CLMETEV at $p < 0.05$.

[14] The drop in frequency is significant (at $p < 0.05$) when comparing the 6 instances in LOB to the 10 instances in the ukbooks section of CB.

[15] The same picture emerges when we compare the number of instances of intransitive *worth* to the number of instances of transitive *worth*: these are 124 and 105, respectively, in ukbooks, as opposed to 21 and 97 for usbooks. Using these figures, the difference between British and American English is significant at $p < 0.0001$.

ble shows that both intransitive *worth* and intransitive *worthwhile* are British English constructions. Important is also the absence of intransitive *worthwhile* in BROWN, which suggests that in earlier stages of the language, too, *worthwhile* was largely absent in American English. Thus, there seems to have been no American developments paralleling the British developments shown in Figure 6 above, involving first a rise in frequency of intransitive *worthwhile*, closely followed by a rise in frequency of intransitive *worth*. If the surge in frequency of intransitive *worth* occurred under the influence of intransitive *worthwhile*, it is to be expected that this happened primarily in the regional variety that had intransitive *worthwhile*. The data bear out this expectation, adding support to a connection between intransitive *worth* and intransitive *worthwhile* (see De Vogelaer, Devos & Van Der Auwera 2006: 221 for a similar argument using lectal variation to support an analogy-based account of historical change).

Table 1

Frequency of intransitive *worth* and intransitive *worthwhile* in present-day British and American English (frequencies per million words).

[INSERT TABLE 1 HERE]

This interpretation of the historical course of events throws up two further issues. First, there is the question why intransitive *worthwhile* did not outcompete *worth* at the time when intransitive *worth* was still extremely marginal, between 1850 and 1920 – or, more subtly, how one can claim that intransitive *worthwile* first promoted the use of intransitive *worth* but, at the same time maintain that the increased use of intransitive *worth* did not promote intransitive *worthwhile*. A possible answer is that, even though the frequency of intransitive *worth* was extremely low, the overall frequency of *worth* has always been much higher than that of *worthwhile* (the frequency of *worth* in the transitive gerundial pattern alone lies at 36.8 instances per million words for the third sub-period of CLMETEV, and at 33.0 for CEN). Added to

[16] The figure for intransitive *worth* in ukbooks is not entirely accurate. Intransitive *worth* occurs 124 times in the ukbooks section of CB, which makes for 23.2 instances per million words. Of the 124 instances, however, 38 occur in the same text on gardening (D. Kitto, 1986, *Planning your Organic Vegetable Garden*). To compensate for this, I have omitted all examples from the gardening text, and recalculated relative frequencies. Because there is no information on the size of the omitted text, relative frequencies have been calculated on the basis of the full sub-corpus' size and are therefore slightly too low. The difference between American and British English is clear enough, however.

that is the fact that *worth* is shorter and therefore more economical than *worthwhile*, while *worthwhile*, having become morphologically opaque, has no obvious advantage over *worth* in terms of transparency. Arguably, then, it was impossible for the dwarf to beat the giant, even when given a head-start. This kind of interaction is comparable to what Hopper (1991: 25-8) describes as "specialization", which starts from a parallel and roughly simultaneous development of functionally equivalent constructions but ends with the dominance of one construction over the others.

Second, the interpretation departs somewhat from the traditional assumption that the S-curve attested in linguistic change reflects a historical development whereby an innovation is first introduced by individuals due to language-internal mechanisms (or language contact), and then due to social mechanisms suddenly catches on and spreads across the language community, establishing itself as a new feature of the (abstract) language system (Aitchison 1991; Croft 2000; Milroy 1992). For intransitive *worth*, the first phase would correspond to the long period of lingering use between 1640 and 1920, while the second phase of general social diffusion would correspond to the jump in frequency after 1920. Some form of social diffusion is logically necessary, but what is suggested here is that this social diffusion is not or not only set off by changing social, language-external conditions. In particular, a language-internal factor is proposed, namely the availability of a new analogical model (intransitive *worthwhile*) that was semantically considerably closer to the lingering intransitive pattern of *worth* than the extraposition constructions with other adjectives. Changing language-internal conditions – rather than or in addition to changing language-external conditions – thus transformed intransitive *worth* from almost unacceptable to reasonably grammatical, creating the new conditions under which an increasing number of language users could become persuaded of the acceptability of the innovative form.

If this interpretation of the development of intransitive *worth* is correct, it provides a piece of empirical evidence, showing that the new construction in which *worth* occurs is essentially dependent on an analogical model. The analogical model is the gerund clause extraposition construction, and its role as a model is apparent from the fact that the acceptability of the new construction improves as the model due to independent changes – i.e. the appearance of *worthwhile* with extraposed gerunds – more closely approaches the new construction.

Summing up, then, the developments affecting *worth* and *worthwhile* may look like straightforward instances of reanalysis, with ambiguous uses leading to the establishment of new syntactic patterns, but an account only in terms of reanalysis oversimplifies matters. Gradual semantic change in the old source construction is essential for the new uses to become possible at all. Moreover, it is plausible that the new patterns did not arise independently, but were modelled on and derived their acceptability from existent patterns elsewhere in the language.

3. The development of the English *for…to*-infinitive

Unlike the changes affecting *worth* and *worthwhile*, the emergence of the *for…to*-infinitive has received considerable attention in the literature. In Section 3.1 the more or less commonly accepted view of the change as a straightforward instance of reanalysis is briefly outlined and then confronted with the historical record. Section 3.2 subsequently presents an alternative view of the change.

3.1. The traditional account

The historical process that gave rise to *for...to*-infinitives is by most accounts well-understood and has even become a textbook example of reanalysis and subsequent actualisation (Fischer 1988; Harris & Campbell 1995: 62; Jespersen 1940: 302-6; Jørgensen 1975; Newmeyer 1998: 241; Visser 1963-73: §914 – see also Haspelmath 1998: 324-5 who cites the development of the *for…to*-infinitive as one of the few historical changes he finds acceptable instances of reanalysis). As the traditional account has it, what was originally an 'organic' *for*-NP – i.e. a *for*-NP dependent on an element outside the *to*-infinitive clause – has been reanalysed as part of the *to*-infinitive clause with which it happened to co-occur. This meant that the preposition *for* lost whatever meaning it had and became an 'inorganic' infinitival subject marker.

The various steps of this development are often reconstructed from present-day usage, as shown in (24). Example (24a) illustrates the original situation or source structure: an organic *for*-NP followed by a *to*-infinitive. That the *for*-NP is not part of the *to*-infinitive is evident from the possibility to omit or replace either the *for*-NP or the *to*-infinitive without producing an ungrammatical sentence. Notice, though, that even in (24a) the *for*-NP controls the *to*-infinitive and thus already functions as its no-

tional subject. Example (24b) is ambiguous: the extraposed subject of the sentence could be either the simple *to*-infinitive or the whole sequence of *for*-NP and *to*-infinitive. In the former interpretation the *for*-NP is organic and marks the benefactive of *good*; in the latter interpretation, it is the subject of the *to*-infinitive and a new (implicit) benefactive could be provided to complement *good*, e.g. *good for society*. Example (24c) is very plausibly a genuine *for…to*-infinitive, because despite the fact that the adjective *impossible* can also take *for*-NPs, it is unlikely that this should be the function of the inanimate NP *the poison*. Example (24d), finally, illustrates the extension of the construction to radically new environments – *wise* being an adjective that does not normally take *for*-NPs.

(24) a. Window locks can make it extremely difficult *for the thief to break* in without making a lot of attention-drawing noise. (CB)
b. It is generally recognised to be good *for people to own* their own houses. (LOB)
c. I can assure you that short of a conspiracy among these three it is absolutely impossible *for the poison to have* been administered in Wynter's breakfast. (LOB)
d. In these cases it is wise *for patients to be* taken to casualty first. (CB)

In brief, (24a) illustrates the source construction, (24b) the *locus* of reanalysis, and (24c-d) illustrate actualisation of the new sequence. As such, the examples in (24) are suggestive of the historical process that gave rise to the *for…to*-infinitive. The change can be formalised as in (24b)' and (24b)", with (24b)' representing the original structure, and (24b)" representing the outcome of reanalysis.

(24) b.' It_i is [good for people] [to own their own houses]$_i$.
b." It_i is [good] [for people to own their own houses]$_i$.

On closer scrutiny, however, the reanalysis-account is not without its problems. Symptomatic is the fact that the literature is confused about when the change actually took place. More importantly, whenever the change has been discussed, the focus has persistently been on *for…to*-sequences functioning as extraposed subject (as in the examples quoted so far), while the *for…to*-sequences in other environments have been

largely ignored. Thus, Visser (1963-73: §914) only provides explicit discussion of the transition from organic to inorganic *for* in relation to extraposition structures. He is extremely cautious when identifying his earliest instances, finding his first example of a genuine *for…to*-infinitive as late as 1870. Doing so, however, he ignores the fact that some of his examples of *for…to*-sequences in other syntactic environments clearly have inorganic *for* and are considerably older (see §937, §945, §952).[17] Jespersen's (1940: 309) discussion of historical change also starts from extraposition structures, but in contrast to Visser, he finds his first instance (*it is not possible for all things to be well*) in Robinson's 1551 translation of Thomas More's *Utopia*, which dating is confirmed by Fischer (1992: 331). Harris & Campbell (1995: 62), finally, do not provide any unambiguous instances, but their quoting an ambiguous example from Chaucer – again with a *for…to*-sequence in extraposed subject position – may lead us to believe that reanalysis took place even earlier, sometime between the end of the fourteenth and the beginning of the fifteenth century.

The corpus data available for the period indicate that Jespersen's dating is the most accurate one, at least as far as the extraposed structures are concerned. While organic and ambiguous examples are in evidence from the end of the fourteenth century, as shown in (25), the first instances with clearly inorganic *for* – rendered here in (26) – are found in the early sixteenth century:

(25) a. Þus endeþ þe secunde degre of Contemplacion, in Holi writ; wherof and [i.e. 'if'] þou take good hede, hit schal ben liht *for þe to holden* eueri sarmoun. (c1390, PPCME2)

b. hit is a foule þing *for a kyng to iangle* moche at þe feste and nouȝt fiȝte in batayle. (1387, PPCME2)

(26) a. by the whiche I do perceyve that the Gentilwoman beyng accompaned with your said doughter unto your howse, hath informed you that it was my mynde *for hir to certyfye* you that the Controwler of the Pryncesse howsolde dothe bere hys synguler favour to your said doughter. (1538, PPCEME)

[17] Visser (1963-73) nowhere explicitly endorses an account in terms of reanalysis. Confusingly, he even appears to provide evidence against reanalysis when he draws attention to the fact that in his own examples *for…to*-sequences with inorganic *for* were used as fronted (i.e. non-extraposed) subjects before they began to occur in extraposition structures (see §914). As can be seen from the discussion in Jespersen (1940), however, Visser's chronology is incorrect.

b. But forasmuch as it is parte of thy medicine, *for the to know* these thynges, although I haue lytle leysure to do it, yet I wyl endeuor my selfe to declare somwhat thereof. (1556, PPCEME)

Misleadingly, however, the examples in (26) create the impression that in the sixteenth century the new construction solely appeared in extraposed-subject position. This is not true. *For…to*-infinitives also occurred in other syntactic environments in the sixteenth century. These other *for…to*-infinitives would either function as postmodifier to a noun, adjunct, adjective complement, or verb complement. Example (27a) very plausibly illustrates a *for…to*-infinitive postmodifying a noun (*maners or wayes*); (27b) illustrates a *for…to*-infinitive either postmodifying a noun (*hertes*), complementing an adjective (*apte*), or functioning as purpose adjunct; and (27c) illustrates a probable *for…to*-infinitive either functioning as verb complement (to *had wrytten*) or as purpose adjunct.

(27) a. goddes wyll and plesure, beyng set fast in the towre, or profounde altitude of hys simplicitie or puritie, hath appoynted many maners or wayes, *for thynges to be* done: (1556, PPCEME)

b. Nowe clottinge them, by breakynge their stonie hertes, and by making them supple herted, and makyng them to haue hertes of fleshe, that is soft hertes, and apte *for doctrine to enter* in. (1549, PPCEME)

c. And when he came for his ox, he answered him and sayd; Sir John Roclife had wrytten *for certayne tenaunts to be* so taryed by him, and spirred [i.e. 'asked'] him, whose tenaunt he was (1502-4, PPCEME)

Moreover, unlike the *for…to*-infinitives functioning as extraposed subjects, the patterns illustrated in (27) are in fact older than the sixteenth century. As shown in (28), in Late Middle English, too, *for…to*-infinitives can be found functioning as adjunct or noun postmodifier.

(28) a. Also it ys a certayn techinge *for hele* [i.e. 'health'] *to be* keped, þat a man vse metys þat accordyn to his complexioun and nature (1400-49, IMEPC)

b. and whan tyme was, the cordes were cutt / and the Trumpetis blew vp, *for euery man to do* his deuoir (1450-99, IMEPC)

c. the Bysshop of Norwych makyth but delayes in my resonable desyre *for an eende to be* had in the xxv. marc of Hykelyng, (1400-49, IMEPC)

The explanation given so far for the emergence of *for…to*-infinitives has evidently not done full justice to the historical facts, in that the environment commonly claimed to have given rise to the new structure was not the environment where the new structure actually first appeared.

At this point, the account purely in terms of reanalysis may still be rescued, because ambiguity is not strictly limited to extraposition contexts. The *for…to*-infinitives in (27)-(28) too might result from reanalysis triggered by predecessors with ambiguous *for*-NPs, such as the examples in (29). The *to*-infinitive (*to seylen in*) and *for*-NP (*for hem-self*) in (29a) might separately postmodify the noun *a ship*, or might form a single *for…to*-infinitive with the same function. In (29b) the *to*-infinitive (*to be songen for ye soule of ye dede*) might postmodify the noun of the *for*-NP (*a messe*), or *for*-NP and *to*-infinitive might be joined into a *for…to*-infinitive functioning as purpose adjunct.

(29) a. Also þis cumpany […] ordeynd a schip *for hem-self to seylyn* in. (c1450, PPCME2)

b. Ande also it is ordeynede, yat when a brother or sister is dede, euery brother and sister shul come to Dirige and to messe; ande at ye messe, eueriche shal offeren an hal-peny, ande yeuen an hal-peny to almesse; ande *for a messe to be* songen for ye soule of ye dede, a peny. (14^{th}/15^{th} c., IMEPC)

This altered reanalysis scenario too, however, faces problems, which are brought to light by more closely examining the distribution of both organic and inorganic *for…to*-sequences over different syntactic environments. Drawing on the corpus material from PPCEME, Table 2 provides a detailed picture of the use of *for…to*-sequences in the early sixteenth century, distinguishing between *for…to*-sequences whose *for* allows an organic reading, and *for…to*-sequences whose *for* can only be

interpreted as inorganic.[18] Simultaneously, Table 2 divides the material over the different syntactic environments in which *for…to*-sequences are found to occur.[19] On the one hand, there are the environments where *for…to*-infinitives first emerged, specifically in adjunct position and in the functions with which infinitival adjuncts can be ambiguous – most typically, noun postmodifier and verb complement. On the other, there are the predicand uses, where a *for…to*-sequence follows a noun or adjective that can be said to function (semantically) as its predicate. These include the organic and inorganic *for…to*-sequences in extraposition structures exemplified in (24)-(26) above, but also similar combinations as those in (30), with the *for…to*-sequence functioning as object in an object complement construction (30a), or following an adjective and allowing a paraphrase as extraposed subject (30b) (i.e. *it is expedient for all men to know these three points*).

(30) a. many off my neyghboures […], whoo lamentedde and prayde for me, thynkynge it nott possible *for me to escape* deathe, butt by the greate mercy of God. (after 1561, PPCEME)

b. Heere I shal declare vnto you shortly and breefly the sayinges and the determinations of diuers auncient Authors, in three poyntes, very expedient *for al men to knowe*, that entende to vse or exercise the mysterie or arte of Chirurgerie. (1548, PPCEME)

Table 2 reveals two things. First, it is clear at once that most instances with unambiguously inorganic *for* are found among the non-predicand uses, confirming the revised chronology of change outlined above. Second, it also appears that there is no correlation between the incidence of ambiguous examples and the environments

Table 2

Absolute and relative frequencies (per 100.000 words) of for…to-sequences with organic/inorganic for and unambiguously inorganic for in PPCEME (1500-1570).

[INSERT TABLE 2 HERE]

[18] Frequencies for *for…to*-sequences have been counted on the basis of corpus searches looking for all instances of *for* followed by *to* within a space of four words.

[19] Strictly speaking, on its organic reading a *for…to*-sequence cannot as a whole function as predicand, adjunct, etc., since the *for*-NP has one syntactic function and the *to*-infinitive another. Here and in the discussion that follows, the syntactic function of *for…to*-sequences is assigned on the basis of the inorganic reading.

where unambiguously inorganic *for* turns up, even though that is what a reanalysis-through-ambiguity account would predict. Predicand uses do in fact account for the great majority of ambiguous instances, but only for a minority of the unambiguous cases.[20] The same is true within the group of non-predicand uses, where it is the noun postmodifiers that account for most of the ambiguity but the adjunct positions that yield the most unambiguously inorganic examples. Indirectly, what this indicates is that it might not be ambiguity between organic and inorganic *for* that is in itself responsible for the initial development of the *for…to*-infinitive. Since change did not occur where ambiguity was most prominent, it must be concluded that ambiguity cannot predict the locus of change. Reanalysis, as traditionally conceived, is therefore not the most promising avenue of explanation.

3.2. An alternative explanation

How did *for…to*-infinitives arise then? Looking at the earliest *for…to*-infinitives, one recurrent feature strikes the eye: the majority of early *for…to*-infinitives is passive. This is apparent from the examples already given above – see (27a), (27c), (28a), (28c), and, conceivably, (29b) – and is illustrated anew in (31):[21]

(31) a. Moyses at all tymes had recourse to þe tabernacle *for doutes & questions to be* assoiled, & fled to þe helpe of praier for releving of perels & of myschaunces of men. (15th c., IMEPC)

b. And *for vengaunce to be* taken of the same / Reynawd sendeth you worde by vs, that he shall hange tomorowe rycharde of normandy vpon the gret gate of his towne and thus shall be doon of all your men that he shall take. (1450-99, IMEPC)

[20] The difference in distribution of organic/inorganic *for* and inorganic *for* over the two main syntactic environments is significant ($p < 0.01$).

[21] In late Middle English usage, passive instances account for some 73% of all examples of unambiguous *for…to*-infinitives (i.e. 11 out of 15 instances, including 3 – 2 passive and 1 active – where an organic reading is marginally possible). This figure is based on a 33% sample from IMEPC.

An account in terms of reanalysis through ambiguous *for…to*-sequences would be hard put to explain the prevalence of passive clauses. But the same prevalence does hint at the alternative explanation.

To-infinitives underwent a number of changes in the course of the Middle English period. One was the introduction of (periphrastic) passive infinitives, as illustrated in (32).

(32) þou comaunded þy comaundement *to ben* greteliche [i.e. 'faithfully'] *kept*. (c1350, HC)

Another change is the introduction of *for* (lost again in standard varieties in the Early Modern period) as an infinitive marker reinforcing infinitival *to*, as in (33) (Fischer 2000).

(33) Ne cam ic noht te ȝiuen ȝew for-bisne [i.e. 'to set you an example'] of mire aȝene wille to donne, ac i cam *for to donne* mines fader wille. (a1225, HC)

Finally, as a result of overall changes in word-order, Middle English also saw the loss of infinitives with fronted objects. Structures as in (34), where an object is fronted and ends up in between the infinitive markers *for* and *to*, thus disappeared.

(34) a. men must suffre *for better to haue* (1450-99, IMEPC)
b. and he besohte at gode þat naht ne scolde reinin [i.e. 'rain'], *for ðe folke to kastin* [i.e. 'chastise']. (1200-49, IMEPC)
c. for none envy ne yvel have I drawe this mater togider; but only *for goodnesse to maintayn*, and errours in falsetees to distroy. (1400-49, IMEPC)

We can now see what may have happened. When infinitives with fronted object as in (34) became less acceptable two solutions were available: either to move the object to post-verbal position or to turn it into a subject by passivising the verb. Both solutions bring the '*forto*-infinitives' with fronted objects in line with the new (and rigid) SVO order of English. The last solution of course gives rise to passive *for…to*-infinitives as those found in (31) and other examples above – or in (35) below, where

the old structure (*the people* is the object of *susteyne*) stands side by side with the new pattern (*alle soules* is the subject of *be redemed*). The first *for…to*-infinitives, then, are a syntactic blend between *forto*-infinitives with fronted object and passive infinitives.

(35) That god that created the firmamente, and made alle thynges of noughte, *for the people to susteyne* / And in the crosse suffred deth and passyon *for alle soules to be* redemed out of the peynes of helle, kepe and saue the / kynge charlemayne, emperoure of Almayne and kynge of Fraunce, and all his noble lynee / (1450-99, IMEPC)

This account fits Fischer's (1991, 1992) more general proposal on the motivating factors underlying the emergence of passive infinitives. She states that "the strong pressure exerted by the grammar on NPs before infinitives to take the role of subjects ultimately led to the introduction of passive infinitives on a large scale" (1991: 174). Further corroborating evidence comes from the distribution of the new *for…to*-infinitives. The fact that the new *for…to*-infinitives primarily function as adjuncts echoes Warner's (1982: 123) observation that the older *forto*-infinitives are particularly current in adjunct position, and reflects the fact that nearly all *forto*-infinitives with fronted object attested in the corpus data clearly function as adjuncts (compare the examples under (34) above) (see also Pak 2005).[22]

The alternative account provided here thus has a number of important advantages over the classic reanalysis account. First, the explanation of the emergence of *for...to*-infinitives is brought in line with the contexts in which they are actually found first to appear. Second, the account fits the broader historical context of changes that were at the time affecting the grammar of English. Third, the prevalence of passives among early *for....to*-infinitives is accounted for. Fourth, the explanation does not depend on ambiguity, which has been shown to make the wrong predictions about the locus of change.

With regard to the last point, it should be mentioned that ambiguity is not thereby excluded from playing a role in the further development of *for...to*-infinitives.

[22] More tentatively, some of the verbs listed by Warner (1982: 123) as more or less preferentially selecting *forto*-infinitives as their complements (rather than *to*-infinitives) match the verbs also found with the new *for…to*-infinitives, notably *ordain* and – possibly – *write* (see (27c) and (28a) above).

The subsequent diffusion of *for...to*-infinitives proceeded most easily in those environments where the new clause-type was frequently ambiguous with better-established patterns, including the ambiguous contexts traditionally claimed to have triggered reanalysis (De Smet 2008a). At this point, of course, the ambiguity had become genuine and could be 'exploited' to smuggle in an innovation without superficial upheaval of existing usage. Similarly, the survival of *for...to*-infinitives, which continued in existence despite the loss of *forto*-infinitives (in most dialects of English), may have depended on the availability of ambiguous patterns (De Smet to appear). This covert role of ambiguity and of syntagms superficially similar to the outcome of change is returned to in Section 5 below.

4. Basic mechanisms

A close examination of the developments in constructions with *worth* and *worthwhile* and in *for…to*-sequences reveals that what superficially looks like reanalysis through surface ambiguity may ultimately be motivated by other mechanisms of change. The history of *worth* and *worthwhile* remains an obvious example of rebracketing and superficial reanalysis, except that change has been shown to depend on analogies to a model synchronically available in the linguistic system. By contrast, rebracketing is found to have played no role in the appearance of the first *for...to*-infinitives, which arose as a rather accidental side-effect of other changes taking place in the language. As such, the emergence of *for...to*-infinitives is not even superficially an example of reanalysis, and stands as a reminder that ambiguity at one stage of the language is not necessarily an index of the locus or mechanism of change at an earlier stage.

In isolation, then, the two case-studies indicate that (somewhat self-evidently) the notion of reanalysis should be applied cautiously and that the historical evidence must always be examined critically to understand the more ultimate causes of change. More interestingly, in light of the theoretical concerns raised with respect to reanalysis in Section 1 above, the case-studies confirm that reanalysis can be broken down into more basic mechanisms and give important indications as to what those mechanisms might be. This section briefly considers some of the mechanisms that can be found to underlie reanalysis. The case-study on *worth* and *worthwhile* is most central

in this respect, in that it involves superficial reanalysis. The case-study on the *for...to*-infinitive, however, still exemplifies some of the same basic mechanisms.

As shown above, one underlying mechanism is analogy or *categorial incursion*. Categorial incursion is non-gradual and it therefore closely matches the leap-like nature attributed to reanalysis. Like reanalysis, it may operate through ambiguous surface sequences that allow an alternative interpretation. The main difference is that the new interpretation is licensed by another construction that already exists at the time the change takes place. That is, a new analysis is assigned to a surface sequence but merely recategorises that sequence as a member of an already established category. The change can therefore be seen as analogical extension of one construction into the domain of another. A schematic representation of categorial incursion is given in Figure 7 (notational conventions are the same as those in Figure 1 above).

[INSERT FIGURE 7 HERE]
Fig. 7. Categorial incursion.

The mechanism of categorial incursion does away with the issue of ambiguities that exist only in retrospect: interpretative ambiguity is genuine because each interpretation answers to an existing model. More importantly, the mechanism is firmly grounded in the principles of synchronic grammatical organisation, as the appeal to analogy is foundational to any usage-based theory of language (see Section 1). The diachronic literature provides examples of reanalysis that can be easily interpreted as in essence analogy-based (particularly convincing examples are discussed by Plank 2004 and Kiparsky ms.). To the extent that they are not morphologically productive, cases of word class change also readily classify as instances of categorial incursion (e.g. Denison 2001). Further, the mechanism of categorial incursion is certainly compatible with Harris & Campbell's (1995: 89) notion of "preservative reanalysis". Much more explicitly, finally, categorial incursion is the interpretation given to reanalysis in Fischer (2007: 145).

As to the preceding case-studies, categorial incursion can explain why *worthwhile* acquires a 'transitive' use where other adjectives do not, and why intransitive *worth* becomes dramatically more successful just after the emergence of intransitive *worthwhile*. In the former case, the construction analogically imposing itself is transitive *worth*, in the latter it is intransitive *worthwhile*. The emergence of *for...to*-

infinitives does not strictly answer to the definition of categorial incursion given here. An existing surface structure was not covertly reinterpreted on the basis of an existing pattern but overtly reshaped, SV order being imposed on an originally OV structure by passivisation of the infinitive. Nevertheless, here too the change is analogical in the way all gradual replacive changes are (De Smet 2008a) and converts an old structure into something new on the basis of an available model (viz. SV-order and passivisation).

Notice that because categorial incursion is essentially analogical, it requires some kind of (superficial) similarity between the model of change and the changing surface sequence. This means that categorial incursion is to some extent constrained, as is clearly demonstrated by the development of *worth* and *worthwhile*. Apart from the fact that only the formally and semantically related *worth* and *worthwhile* interfere (and no other adjectives), it probably took additional semantic change before syntactically transitive uses of *worth* sufficiently resembled the intransitive uses of *worthwhile* to undergo the categorial incursion of intransitive *worthwhile* in the first place. In this way, categorial incursion certainly puts stronger constraints on possible changes than the traditional notion of reanalysis. This is not to deny that it is often difficult to ascertain the exact impact of a given analogical model on a given change (Lass 1998), but the requirement of basic similarity still offers a criterion – if sometimes a frustratingly vague one – on what changes to expect and what changes to rule out, and in this way further contributes to explanatory adequacy.

A second mechanism is *gradual category-internal change*: a construction undergoes minor semantic changes, which manifest themselves in new instances, but not necessarily in a new category. Existing categorial boundaries are simply extended, resulting in new uses that did not occur at an earlier stage of the language. If a new category emerges at all – that is, a separately represented construction – it is hypothesised that this happens gradually, running from constructional monosemy over vagueness and polysemy to homonymy. This type of change is visualised in Figure 8. The Figure suggests two stages, but in fact these may be non-discrete and could be accumulated indefinitely: discreteness then exists only with hindsight in that at some point in time uses appear which are decidedly new.

[INSERT FIGURE 8 HERE]

Fig. 8. Category-internal change.

The diachronic mechanism of category-internal change is synchronically supported by the fact that categorial boundaries are flexible (see e.g. Langacker's 1987 notion of 'partial sanction'; or, more generally, the literature on prototypically organised categories, e.g. Coates 1983; Cruse 2000; Geeraerts 1997; Labov 1973; Taylor 1989; Tuggy 1993). Diachronically, many instances of incipient grammaticalisation and semantic change in general may instantiate changes of the type envisaged here (Aijmer 1985; De Smet & Cuyckens 2005; Goossens 2000; Israel 1996; Winters 1987). Often, these changes are mediated by the semanticisation of pragmatic inferences, which introduces another axis of non-discreteness from the pragmatic to the semantic (Traugott & Dasher 2002; Traugott & König 1991), but they may also be driven – or additionally sanctioned – by metaphor (e.g. Heine 1993). Croft's (2000) understanding of reanalysis, which he consistently refers to as "form-function reanalysis", appears to be restricted to this form of change.

This kind of change is again evidenced by the case-studies. Specifically, in the case of *worth* and *worthwhile*, gradual category-internal change is needed to account for the fact that the transition from transitive to intransitive uses (and vice versa) is semantically possible at all. It is gradual category-internal change that has weakened the transitive meaning of *worth*, which in turn made it possible for *worth* to undergo the effects of categorial incursion from *worthwhile*, and conversely for *worth* itself to provide an analogical model to the development of *worthwhile*.

A third mechanism is *automation*. By automation is meant here the process whereby a less schematic construction gradually becomes alienated from its more schematic parent construction. This happens as the more specific construction, through repeated use, becomes more and more firmly represented as a self-consistent 'chunk' of language, whose cognitive activation ceases to require access to the more abstract constructions from which it originally derives. It is because constructions get (ever so slightly) dissociated from their more abstract parent constructions that other mechanisms of change can cause them to drift off from their original uses, which will in turn reinforce independent storage. In Figure 9 the arrowless dotted lines represent weakening links of instantiation. As the Figure shows, this can happen at various levels of schematicity.

[INSERT FIGURE 9 HERE]

Fig. 9. Automation.

Once more, note that automation is well-supported as a phenomenon of everyday language use, and fits in cosily with constructional views of language (Langacker 1987; Croft 2001; Goldberg 2006). Its diachronic relevance has already been pointed out by Bybee (1985: 88, 2006), Croft (2003: 58-9), Krug (2003) and Noël (2006), among others – and constructional isolation is in one form or another also invoked in accounts explicitly supporting the notion of reanalysis (Joseph 1992; Langacker 1977; Lightfoot 1979; and see also Harris & Campbell's 1995: 73-5 discussion of "exploratory expressions", which seems to take the same direction). At the same time, note that automation, as understood here, is not to be conflated with loss of internal structure (which may be its extreme consequence): what primarily happens under automation is the emergence of redundant representation.

To apply this to the case-studies, a certain degree of constructional alienation is required for transitive constructions with *worth* and a gerund clause to semantically drift apart from the use of *worth* with ordinary NPs. It both accounts for (and is no doubt further fed by) the incongruity that arises in the syntax of *worth* (which acquires an intransitive use) and in the syntax of the English gerund (which acquires a very local tough-movement construction of sorts) as a result of the changes affecting *worth* and *worthwhile*. In the words of Joseph (1992: 140), language users "generalize only locally". If that were not so, the changes discussed here would simply have been ruled out.

The emergence of the *for...to*-infinitive is again a less straightforward example, but a role for automation is nevertheless conceivable. Recall that language users had two strategies to rid themselves of undesirable OV-orders: a simple shift to VO order or passivisation. The former option is probably the easiest solution, as patterns of the form '(*for*)*to* V O' were grammatically sanctioned anyhow. The fact that the passivisation option was chosen at all therefore indicates that language users set some store by a pattern with *for* introducing the patient of the *to*-infinitive as an independent chunk of discourse that they preserved by fitting it into a changing grammar. We can somewhat imaginatively picture the fifteenth-century speaker producing a *for* followed by a patient argument, only to realise that completing the clause with an active *to*-infinitive will produce an OV-clause, and to take the last resort of passivisation to produce SV instead. That, however, assumes that the combination of *for* and patient

argument (with or without an underspecified *to*-infinitive) is to some extent a separately stored pattern that can be independently recruited in planning discourse.

5. Concluding remarks

If one is unwilling or hesitant to accept that language users can abruptly introduce radically new categories into their grammars – as seems only possible on the assumption that those categories are procured from the storage room of a universal grammar – ways have to be found for language users to change their grammars in a non-radical manner, on the basis of mechanisms that can be realistically linked to synchronic usage and grammatical organisation, but without ruling out the potentially far-reaching consequences of long-term grammatical change that are well-attested in actual language history.

In this spirit, this paper has focussed on the more specific concern of finding satisfactory explanations for changes traditionally classified under the label of reanalysis, which, as traditionally conceived, is the mechanism par excellence to introduce grammatical novelty. The case-studies have shown that explanations can be found that are grounded in principles of synchronic usage and grammatical organisation. In particular, it has been argued that the changes discussed here proceeded both by language users using what is already available in actual usage, in the form of grammatical structure (through categorial incursion) or in the form of pragmatic implicatures (through gradual category-internal change), and by language users momentarily or consistently ignoring what is available in usage (through automation). Obviously, no claim can be made on the basis of the two case-studies that all instances of (superficial) reanalysis can be accounted for by the mechanisms proposed here. What the case-studies do show is that alternatives to drastic reanalysis exist and are workable in detailed diachronic studies of actual changes.

The evident consequence of this approach is that the notion of reanalysis is seriously hollowed out and appears to become primarily a descriptive label for a certain type of changes that have to be explained as the outcome of more fundamental mechanisms. At least two potentially critical questions follow from this. First, do the more fundamental mechanisms proposed here sufficiently replace for traditional reanalysis as mechanisms that can bring innovation to grammar? Second, if the reduc-

tive approach to reanalysis is followed through, is there any meaningful place left for reanalysis as a specific type of change in a typology of changes?

As to the first question, there is a general view that analogy reinforces existing patterns while "only reanalysis can create new grammatical structures" (Hopper & Traugott 2003: 64). So, how can analogy, which only extends the domain of application of existing structures, create new structures? It is clear that the kind of grammatical innovation the usage-based model allows is comparatively modest, and it is an empirical question whether language change is equally modest as the model implies. In principle, however, the mechanisms proposed *can* produce genuine innovations, especially when they conspire. Analogy, for instance, can work locally (because of automation and language users' lack of overview over the whole grammar) and disrupt the regularities of grammar even as other regularities are reinforced or new regularities instated.

Even radical categorial innovations can conceivably be worked by the mechanisms proposed. By way of illustration, one type of counterargument to abandoning reanalysis in its traditional conception takes the form of abstract examples such as the following:[23] English at some point introduced auxiliaries, so conceivably there must have been a first auxiliary, but how could the first English auxiliary be analysed as an auxiliary without drastic reanalysis, given that analogically-based categorial incursion is impossible in the absence of other auxiliaries? So how could auxiliaries ever emerge without a first auxiliary? The answer, I believe, is that, paradoxically, the first English auxiliary could not be analysed as an auxiliary until there was a second one. Before that time, the 'auxiliary' would have been an under-analysed and grammatically isolated chunk of language that had undergone both gradual category-internal change and automation. Only when another such chunk developed, language users could perceive a similarity between the two. At that point a category 'auxiliary' arises, which, however, entails no more than that perceived similarity.

This abstract example is an analogue to what happened in the case of *worth* and *worthwhile*. English had no gerundial tough-movement construction until *worth* underwent gradual category-internal change, became automated to some degree, and drew the intransitive adjective *worthwhile* into its sphere of influence, resulting in a new (minimally) productive construction type. The *for...to*-infinitive has only gotten

[23] This kind of problem has been pointed out to me by Graeme Trousdale (p.c.) and Freek Vandevelde (p.c.).

halfway in this scenario of change. From the perspective of the linguist who aims to label what s/he finds, *for* emerged as an 'infinitival subject marker' when *for...to*-infinitives survived while the older *forto*-infinitives from which they directly derive disappeared. But from the perspective of the language user, *for* needs no categorial membership label as long as there is no element that behaves sufficiently like it to belong in the same category. In this view, the history of *for* need involve no shift to a new grammatical category that is not supported by regularities inferable from actual usage.

The second question – whether there is any meaningful place left for reanalysis as a type of change – requires a balanced answer. If reanalysis can be broken down into more fundamental mechanisms, it becomes epiphenomenal to those mechanisms. Eventually, reanalysis is not itself a mechanism of change then. At the same time, it is possible that reanalysis still represents a particular going together of (more fundamental) mechanisms of change under particular linguistic circumstances. As a specific constellation of mechanisms, then, reanalysis may be a linguistically significant type of change. In addition, the analogy responsible for reanalysis is unique in involving extension to a syntagm that already exists. This prior existence of a syntagm can be seen as an extreme case of the similarity that analogy normally requires: the source and target of analogical extension are so similar that the extension is superficially invisible. It is plausible, therefore, that the prior existence of the syntagm is a significant factor in bringing the analogical extension about. In general, language users prefer changes that are unobtrusive, at least superficially (Aitchison 1991; Bybee & Slobin 1982b; Naro 1981; Plank 2004), so it is plausible that the availability of a syntagm that superficially resembles the outcome of analogical extension facilitates change. In this sense, too, reanalysis remains a relevant type of change, as analogy disguising its outcome under an existing syntagm.

Appendix

The discussion in the case-studies is based on surveys of corpus data. The corpora used are detailed in Table A. All these corpora represent British English, except for CEN and CB, which also contain American and – in the case of CB – Australian English.

Table A
Corpus data used.
[INSERT TABLE A HERE]

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TABLE 1

Corpus	Corpus size	Time	Regional variety	Intransitive *worth*	Intransitive *worthwhile*
LOB	1 million words	1961	British English	8.0	6.0
FLOB	1 million words	1990s	British English	7.0	1.0
CB; ukbooks	5.35 million words	1990s	British English	16.1	1.9
BROWN	1 million words	1961	American English	3.0	0.0
FROWN	1 million words	1990s	American English	2.0	0.0
CB; usbooks	5.63 million words	1990s	American English	3.7	0.2

TABLE 2

SYNTACTIC FUNCTION	± inorganic *for*		+ inorganic *for*	
Predicand uses:				
Extraposed subject	50	8.6	2	0.3
Adjective postmodifier	12	2.1	0	0.0
Extraposed object	2	0.3	0	0.0
Sub-total predicand uses	64	11.0	2	0.3
Non-predicand uses:				
Noun postmodifier (relativisation)	10	1.7	0	0.0
Noun postmodifier (complementation)	8	1.4	1	0.2
Adjunct of comparison	3	0.5	0	0.0
Purpose adjunct	2	0.3	3	0.5
Verb complement	2	0.3	0	0.0
Purpose adjunct/noun postmodifier	2	0.3	1	0.2
Purpose adjunct/verb complement	1	0.2	2	0.3
Purpose adjunct/adjective complement/noun postmodifier	0	0.0	1	0.2
Sub-total non-predicand uses	28	4.8	8	1.4
TOTAL	92	15.9	10	1.7

TABLE A

Corpus	Abbreviated title	Period covered	Size
Penn-Helsinki Parsed Corpus of Middle English Second Edition	PPCME2	1150-1500	1.16 million words
Innsbruck Middle English Prose Corpus (Sampler)	IMEPC	1100-1500	3.55 million words
Penn-Parsed Corpus of Early Modern English	PPCEME	1500-1570	0.58 million words
		1570-1640	0.65 million words
		1640-1710	0.57 million words
The first part of the *Lampeter Corpus*	LC	the sections covering 1640-1710	0.85 million words
Corpus of Early Modern English Texts	CEMET	1640-1710	1.94 million words
Corpus of Late Modern English Texts (Extended Version)	CLMETEV	1710-1780	3.04 million words
		1780-1850	5.72 million words
		1850-920	6.25 million words
Corpus of English Novels	CEN	1880-1922	26.23 million words
Lancaster/Oslo/Bergen Corpus of British English	LOB	1961	1 million words
Freiburg-LOB Corpus of British English	FLOB	1990s	1 million words
Collins Cobuild Corpus	CB	roughly 1990-1995	57.42 million words

FIGURE 1

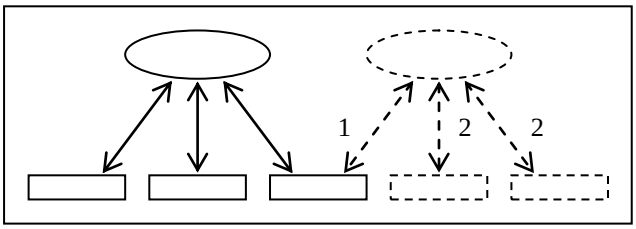


FIGURE 2

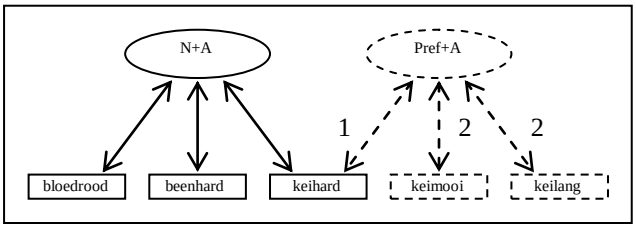
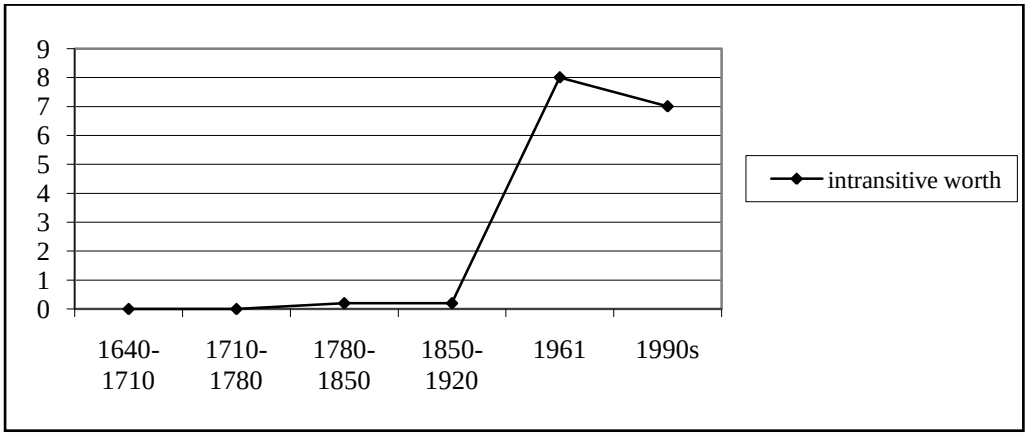


FIGURE 3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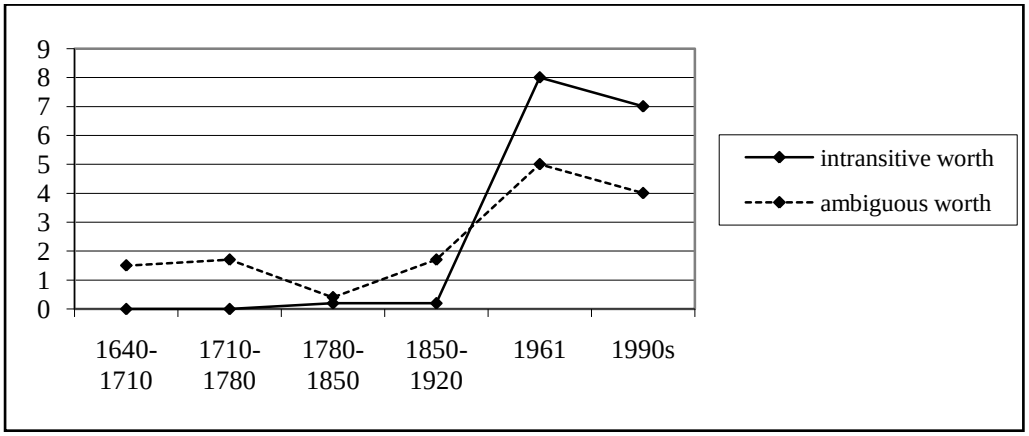
intransitive worth

FIGURE 4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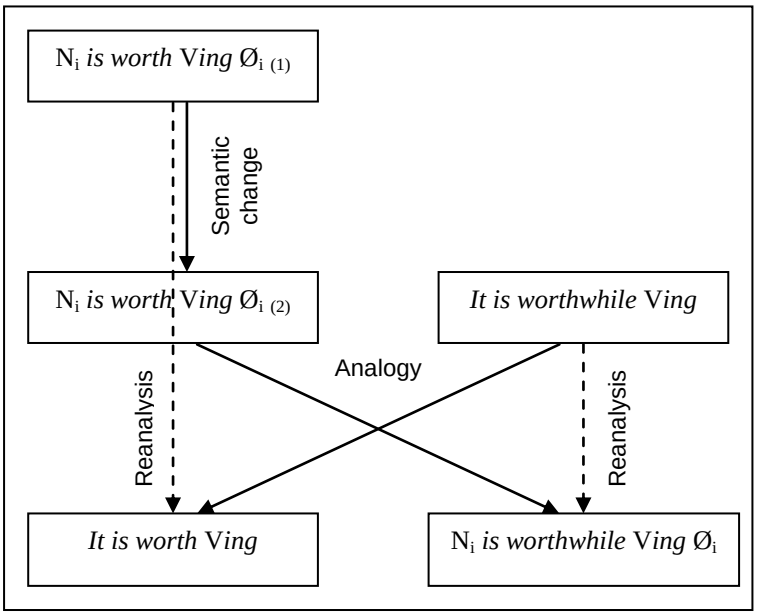
1990s
intransitive worth
ambiguous worth

FIGURE 5


Ni is worth Ving Øi (1)
Semantic change
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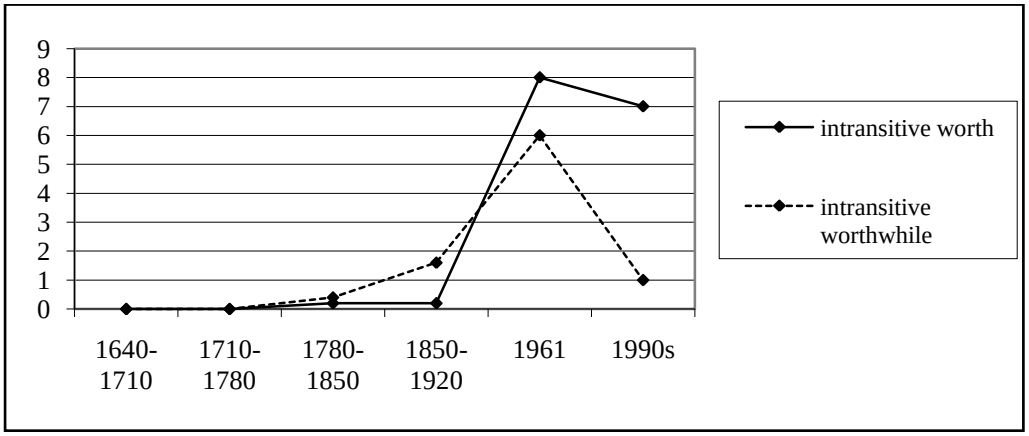
Analogy
Reanalysis
Reanalysis
It is worth Ving
Ni is worthwhile Ving Øi

FIGURE 6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intransitive worthwhile

FIGURE 7

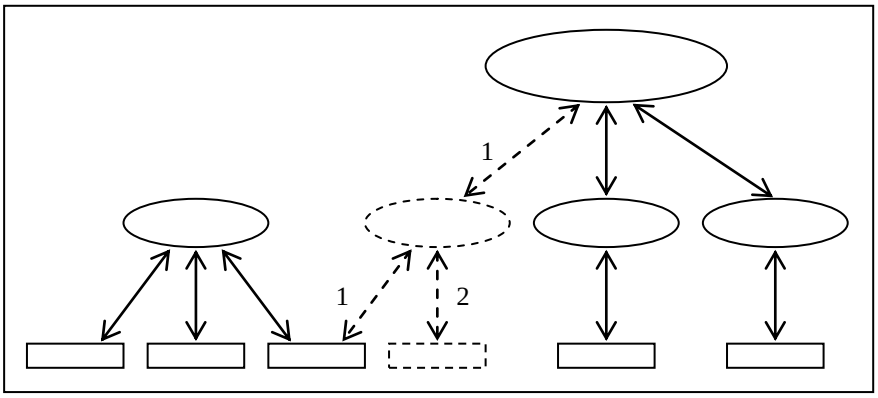

FIGURE 8

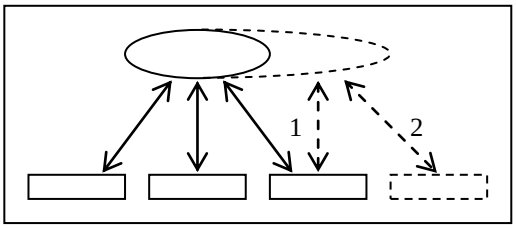

FIGURE 9