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## (Apparently) competing motivations in morpho-syntactic variation

### Abstract

(Key words: grammatical variation, synthetic, analytic, processing, cognitive complexity)

With the revived interest in variation there has been a growing readiness to incorporate competing motivations into linguistic theory-building. In previous work (Mondorf 2009a), I have established that English comparatives are a showcase of grammatical variation, in which what looks like competing motivations at first glance, turns out to be an emergent division of labour between synthetic and analytic means of expressing comparison.

Analyticity is resorted to if explicitness is required because of an increased processing effort. Syntheticity is preferred in easy-to-process environments. This paper discusses whether this claim extends to other synthetic-analytic contrasts: Spanish future alternation (e.g. *comeré* vs. *voy a comer*), English future alternation (e.g. *She'll stay* vs. *She's going to stay*), English genitive alternation (e.g. *the topic's relevance* vs. *the relevance of the topic*), English mood alternation (e.g. *if he agree-Ø* vs. *if he should agree*) or German past tense alternation (e.g. *sie brauchte...* vs. *sie hat ... gebraucht*), etc.

## 1 Introduction

Competing motivations in language systems are not easily accommodated into linguistic theory-building (cf. also Mondorf 2010). Traditional grammatical theory had, for a long time, relegated language variation to the realm of performance, thereby declaring it out of bounds for linguistic theory-building. And even in sociolinguistics, the cradle of linguistic variability, research on morphological or syntactic variation, as opposed to phonological or lexical variation, was occasionally impaired by erroneous assumptions concerning an alleged *uniformity of syntax*, which was regarded as “the marker of cohesion in society” by Hudson (1980: 44, 47). By contrast, functional approaches, which seek to explain language form in terms of its function, have tried to accommodate the true extent of grammatical variation, welcoming it as an instructive challenge for linguistic theory-building.

Several volumes explicitly dedicated to grammatical variation (cf. Chambers et al. 2002; Dufter et al. 2009; Kortmann et al. 2004; Maguire & McMahon 2011; Peters et al. 2009; Rohdenburg and Mondorf 2003; Rohdenburg and Schlüter 2009) provide ample evidence for the view that grammatical variation is much more pervasive than formerly expected. This also means that any theory that seeks to reach descriptive adequacy and predictive power needs to come to grips with the internal and external factors that shape and design grammar. The number and diversity of factors constraining grammatical variation can sharpen our eye for uncovering underlying cognitive principles and generalizations. These can neither be dealt with by strictly modular models nor by models assuming a top-down processing in which phonology does not influence grammar. The former fail to account for the observation that languages system-internally trade syntax against morphology (as shown, for instance, in Mondorf 2009a; Rosenbach 2002; Vosberg 2006), while the latter in assuming a top-down processing that first determines grammatical structure and then

arranges pronunciation have been contradicted by findings showing that prosodic requirements govern morphological variation (cf. Schlüter 2005). Similarly, typological approaches and historical linguistics addressing issues of syntheticity vs. analyticity call for integrating additional parameters from all language levels to arrive at a meaningful definition of syntheticity and a more accurate account of typological change (cf. Haspelmath 2010 and Nübling 2010 and the references therein). Thus, it is not surprising that recent conceptions of grammar emphasize the relevance of linguistic variation on all levels of language analysis, as reflected in the frameworks of *Cognitive Grammar* or *Construction Grammar*.

The present paper brings together a range of studies that lend themselves to an explanation in terms of competing motivations in the form of *Analytic Support* (i.e. the tendency to resort to analytic rather than synthetic variants in cognitively demanding environments). It thus bridges the gap between traditionally descriptive variation linguistics and approaches based on typological and psycholinguistic principles, with the primary concern to explain competing motivations governing the choice between functionally equivalent morphological and syntactic structures.

More specifically, this paper argues that at least some synthetic-analytic contrasts lend themselves to an explanation in terms of competing motivations governed by processing demands. Comparative alternation is a showcase of morpho-syntactic variation<sup>1</sup>, where language users have the choice between a synthetic form (e.g. *fuller*) and an analytic variant (*more full*). What looks like competing motivations with two variants competing for the same functional domain at first glance appears to be an emergent division of labour between synthetic and analytic means of expressing comparison. Analyticity is resorted to if explicitness is required because of an increased processing effort. On the other hand,

syntheticity is preferred in easy-to-process environments. The option to mitigate cognitive complexity provides the underlying motivation for the retention of morpho-syntactic variation patterns.<sup>2</sup>

This paper sets out to show that the findings emanating from research on comparatives can be extended to other synthetic-analytic contrasts displaying similar conflict resolution patterns (e.g. future alternation in Spanish and English, genitive alternation in English or mood alternation in English). After all, if the theoretical frameworks lending explanatory power to comparative alternation can justly claim universality, they need to be extendable to other synthetic-analytic contrasts as well. The parallels between English, Spanish and German synthetic-analytic contrasts can be related to Evans and Levinson (2009: 429), stating that universal tendencies

(...) are better explained as stable engineering solutions satisfying multiple design constraints, reflecting both cultural-historical factors and the constraints of human cognition.

Emphasizing the relevance of human cognition as the underlying force for cross-linguistic similarities and restrictions on variability, the present paper suggests that apparently competing motivations in synthetic-analytic contrasts come to be resolved in the form of a finely-tuned division of labour in line with general processing principles. In accordance with Wasow and Arnold's (2003: 148) claim that "(...) at least some categorical constraints are simply the limiting cases of more general statistical tendencies", we find that the synthetic vs. the analytic forms of comparative alternation are merely the extremes on a finely-graded scale ranging from 0% analytic formation to 100 % analytic formation.

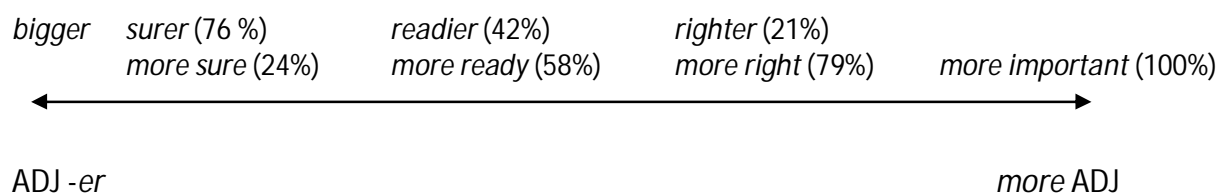


Figure 1. Synthetic-analytic scale for individual adjectives

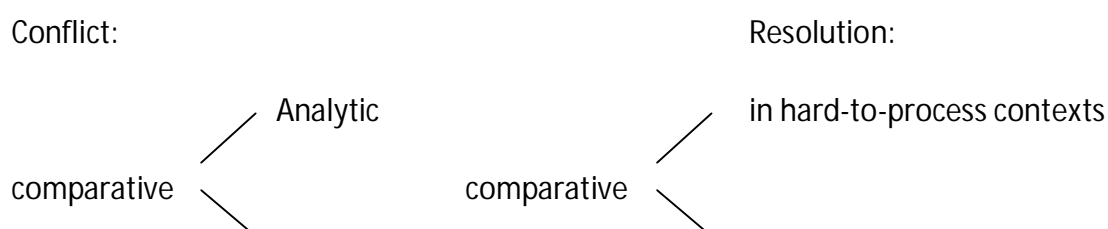
Thus, we are faced with a high degree of variability raising the following question: Why does a language like English retain variation over centuries in its diachronic development rather than promoting one variant to the detriment of the other, thus creating a system in which form-meaning consistency is optimized?

The findings emanating from research on synthetic-analytic contrasts will be related to theoretical frameworks and generalizations that hold some potential for explaining morpho-syntactic variation, such as

- The Principle of Uniformity and Transparency (Wurzel 1987)
- The Competition Model (Bates & MacWhinney 1987)
- Theories of processing efficiency (Hawkins 1994)
- The Complexity Principle (Rohdenburg 1996).

as well as to type "C Contextualizing the two statements" of Moravcsik's (this volume)

fourfold typology of conflict resolution:



Synthetic

in easy-to-process contexts

This paper is structured as follows: Section 2 draws on previous research on morpho-syntactic alternation in order to pursue the question of which linguistic environments favour analytic variants over synthetic ones. Theoretical frameworks implying that analytic variants are easier to process than synthetic ones will be presented in section 3, where it will be argued that analytic forms are apt to mitigate cognitive complexity of their linguistic environments. This poses the intricate problem of delimiting and operationalizing syntheticity and analyticity dealt with in section 4. The paper closes with a conclusion showing that what appears to be competing motivations at first sight turns out to be a functionally motivated division of labour with analytic variants being resorted to in cognitively demanding situations.

## 2 In which linguistic environments do language users favour analytic variants over synthetic ones?

In a book-length study investigating the factors determining the choice between the *more*-variant (e.g. *more full*) and the *-er*-variant (e.g. *fuller*) I have shown that the analytic comparative variant tends to be resorted to in cognitively complex environments, i.e. environments which exert an extra processing load, while the *-er*-variant is more prone to occur in easy-to-process environments (cf. Mondorf 2009a)<sup>3</sup>. This distribution is well in line with the Complexity Principle stating that:

In the case of more or less explicit grammatical option(s) the more explicit one(s) tend to be chosen in cognitively complex environments. (Rohdenburg 1996: 151)

Thus, the more explicit variant (*more full*) is shown to be preferred in cognitively complex environments, a finding subsumed under the heading of *more*-support. We can now derive the notion of Analytic Support:

(...) in cognitively complex environments that require an increased processing load, language users tend to compensate for the increased processing load by resorting to the analytic (*more*) rather than the synthetic (*-er*) variant. (Mondorf 2009a: 8)

This can be summarized as follows:

high processing load	⇒	higher ratio of <i>more</i>
low processing load	⇒	higher ratio of <i>-er</i>

The claim that the more explicit variant is preferred in cognitively complex environments requires defining two concepts. The first concerns the classification of the *more*-variant as more explicit than the *-er*-variant and the second concerns the notion of cognitive complexity.

The classification of *more* as the explicit variant is made on morphological and phonological grounds: Morphologically, *more* is a free form, while the *-er*-variant is bound. Phonologically *more* is able to receive stress, while *-er* is not.

Criteria for cognitive complexity are more difficult to formulate, partly because cognitive complexity can arise on all levels of linguistic analysis: morphology, syntax, semantics, lexicon, phonology, etc. Figure 2 below presents an overview of 26 determinants that have been shown to affect comparative alternation (cf. Mondorf 2009a):

- Syntactic complexity, for instance, correlates with constituent structure viewed in terms of both length and hierarchical ordering. Consequently, claims concerning syntactic complexity need to draw on constituent structure and dependency relations. For

instance, the presence of a prepositional complement can render the adjective phrase harder to process (e.g. *proud of him*). We will return to this issue in section 4.6.

- By contrast, phonological complexity can arise from phonotactic principles, e.g. through the occurrence of certain consonant clusters (e.g. in words like *strict, apt*), which are typologically dispreferred in the world's languages, or through violations of rhythmic alternation patterns, etc.
- Semantic complexity can result from different accessibilities of e.g. concrete vs. abstract concepts (described in more detail in section 4.3).

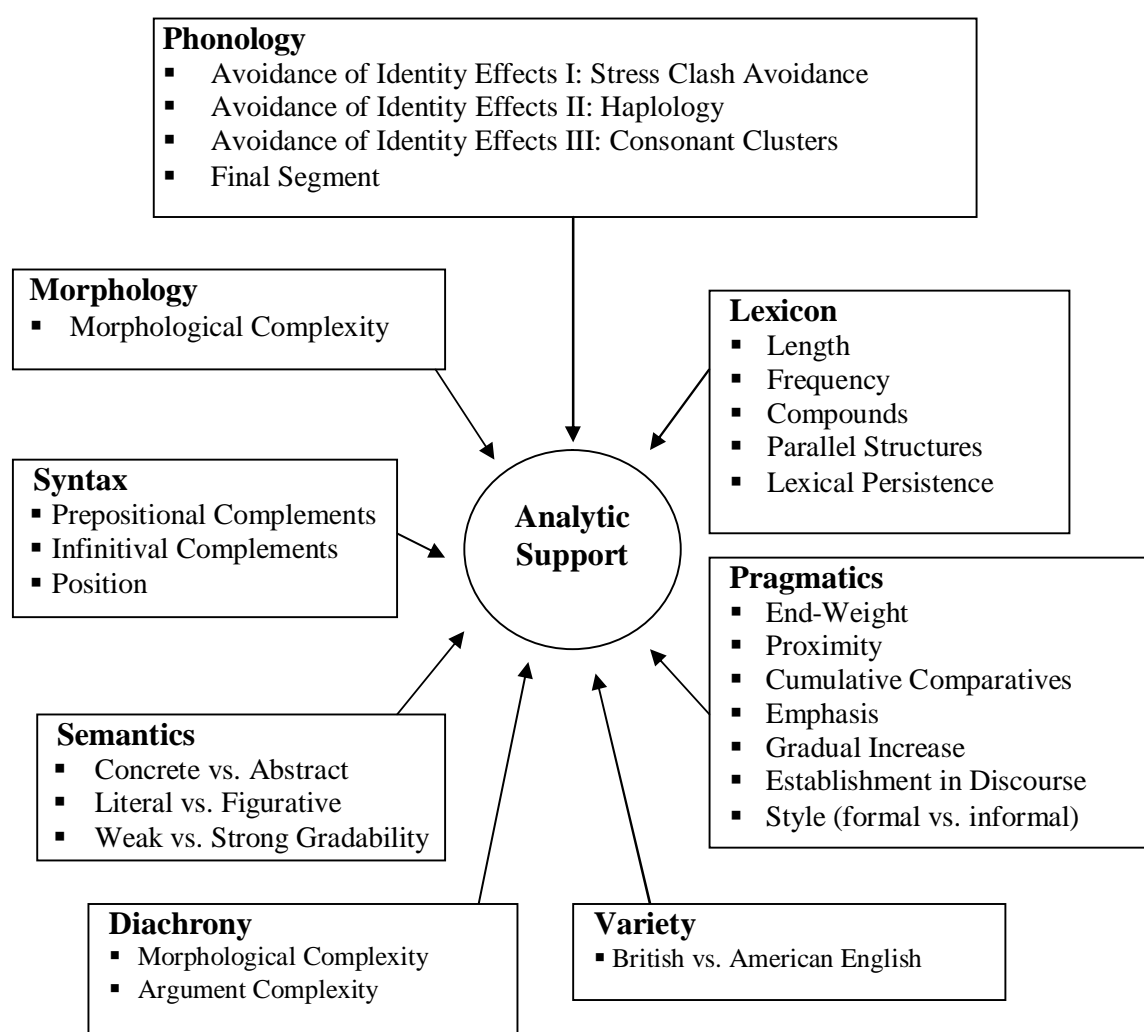


Figure 2. The domains of analytic support<sup>4</sup> (based on Mondorf 2009a: 197)



Thus, the defining features of cognitive complexity need to be developed separately for each level. This does not mean that we cannot grasp the common denominator of complexity across language levels. It just means that our measures for complexity need to adapt to these levels. Consequently, one of the problems we face when trying to define cognitive complexity is that we require a concept that is wide enough to encompass very diverse language levels (phonology, morphology, syntax, semantics, pragmatics, etc.) but at the same time narrow enough to include those – and only those – parameters that can be grasped in terms of complexity. The criteria to be discussed in the present paper are, however, sufficiently well-established throughout the literature to permit their analysis in terms of cognitive complexity. While Figure 2 forms the basis for the present analysis by displaying complexity factors influencing comparative alternation as one well-researched case of synthetic-analytic contrasts, the present paper sets out to relate these and additional complexity parameters to other synthetic-analytic contrasts, such as e.g.:

1. English comparative alternation: *fuller* vs. *more full*
2. English genitive alternation: *the topic's relevance* vs. *the relevance of the topic*
3. English future tense alternation: *will* vs. *going to*
4. English mood alternation: *if he agree-Ø* (subjunctive) or *if he agrees* (indicative) vs. *if he should agree* (modal periphrasis)
5. Spanish future tense alternation: *comeré* vs. *voy a comer*
6. German past tense alternation: *Sie brauchte ...* vs. *Sie hat ... gebraucht*.

It is furthermore assumed that entities that are cognitively complex are harder to process than cognitively simpler entities. This implies that delayed reaction times, higher ratios of

speech errors and lower scores in serial recall tasks can be expected to correlate with compensatory use of more explicit variants. Pending psycholinguistic experiments, some of these corpus-based correlations still await independent validation. However, the in-depth analyses of the synthetic-analytic alternations covered here are characterized by a whole range of findings pointing in the same direction. Additionally, psycholinguistic evidence for the processing load of the complexity parameters presented will be adduced wherever available.

### 3 Why are analytic variants easier to process?

According to the *Principle of Uniformity and Transparency* postulated by Wurzel (1987), a high degree of form-function mapping should favour the processing of a linguistic unit, since fewer options need to be retained in working memory. Applied to morpho-syntactic variation, this principle would mean that the sheer existence of a synthetic next to an analytic variant in a language should impede the processing of e.g. comparatives in English.<sup>5</sup> As regards the individual variants, one could argue that the *more*-variant is 'better' in terms of form-function mapping, since it helps to disentangle a complex lexeme consisting of a base plus inflectional suffix by assigning each function a separate form.

The *Competition Model* by Bates & MacWhinney (1987) states that linguistic items which form reliable cues facilitate processing, while less reliable cues exert a higher processing load. A reliable cue is one that is closely linked with a specific function. Trying to apply the Competition Model to comparative alternation, we would have to find out how reliable the individual variants are as cues for the respective grammatical structure. For instance, the analytic variant *more* does not uniquely single out a degree phrase, since it can also function as quantifier:

(1) The Americans have more heavy armour on the streets of Port-au-Prince than originally envisioned. [*Times* 1994]

*More* is not a perfect cue for comparative formation. But neither is the synthetic variant *-er*, since it has a homonymic morph which serves as agentivity marker, though not on ADJs but on nouns (cf. Köpcke 1998:300; MacWhinney et al. 1985:184):

(2) painter, writer

If applicable at all, MacWhinney and Bates' (1985) Competition Model would predict that the analytic variant is a better cue, because *more* is closely tied to the expression of comparative degree (with the numerically small exception of quantifier uses), while the suffix *-er* is highly pervasive in other functions. However, the parameters for measuring cue applicability cannot easily be operationalized for comparative alternation: Though *more* as a quantifier is rarer and hence it is a more reliable cue for indicating comparatives, agentive *-er* attaches only to verbs, so that ambiguity would not arise at all with *-er*, which in turn might make it more reliable after all. *More* can precede adjectives in its quantifier and degree marker functions as in (1) above, which would make it potentially more ambiguous than *-er*.

Psycholinguistic research on morphologically complex words has revealed that their accessibility in the mental lexicon is constrained by an entire network of frequency-related factors. While earlier approaches have assumed that either the whole-word route is used (i.e. *fuller* would be directly accessed as one word) or the decomposed route (i.e. the components *full* + *er* would be stored and assembled on the spot), recent findings based on eye tracking suggest dual or even multiple route models which make use of all possible cues available in processing morphologically complex words (cf. Kuperman et al. 2008: 3-6; Plag 2003: 176). Comparatives offer the choice between a morphologically simple form (*more*

*full*) and a morphologically complex one (*fuller*). However, the applicability of multiple route models to both comparative variants should not easily be discarded. After all, *more full* could also take the dual route, even though it is not morphologically complex. In the face of ample research on family size effects and other frequency-related parameters for both morphologically simple and complex words (cf. Hay 2001; Schreuder and Baayen 1997;) as well as findings on the gradience of lexical fusion in adjectival compounds (*wider-spread* vs *more wide-spread* in Mondorf 2009a: 44f), we would be well-advised to not rule out the possibility that such frequency-related parameters also affect the combined processing of two separate lexemes, such as *more full*.

Another theoretical approach that can be applied to comparative alternation is Hawkins' (2003: 200) *Theory of Processing Efficiency* which states that

(...) language users have a choice between less form processing (...) but more dependent processing on the one hand, and more form processing (explicit marking) with less dependent processing on the other. One can speculate that the working memory demands of dependent processing across large domains exceed the processing cost of additional form (and meaning) processing through explicit marking.

Language users thus weigh the pros and cons of the explicit *more*-variant as opposed to the more dependent *-er* variant. Note that Hawkins' (1994; 2003) approach does not conceive of working memory as capacity-constrained but rather as efficiency-based. This means that opting for *-er*, which entails more dependent processing, would not exceed the available processing capacity. It merely adds processing effort that can be avoided by choosing the

more explicit analytic variant. On the other hand, when processing demands are low, we can easily afford to use the *-er* variant.

#### 4 Establishing the notion of Analytic Support

One advantage of the *more*-variant that is not directly related to its analyticity but rather to ordering preferences of elements within phrases is highlighted by Hawkins' (1994) Principle of Mother Node Construction, which states that early recognition of phrase structure facilitates processing.

(...) in the left to right parsing of a sentence a word that can uniquely determine or classify a phrase will immediately be used to construct a representation of that phrase. (Hawkins 1994: 60ff)

Early recognition can help the working memory by option-cutting. Retaining fewer options in the working memory minimizes processing effort. Extending the principle to comparative alternation, the *more*-variant would provide a relatively (though not completely) safe signal that a degree phrase (DegP) follows.

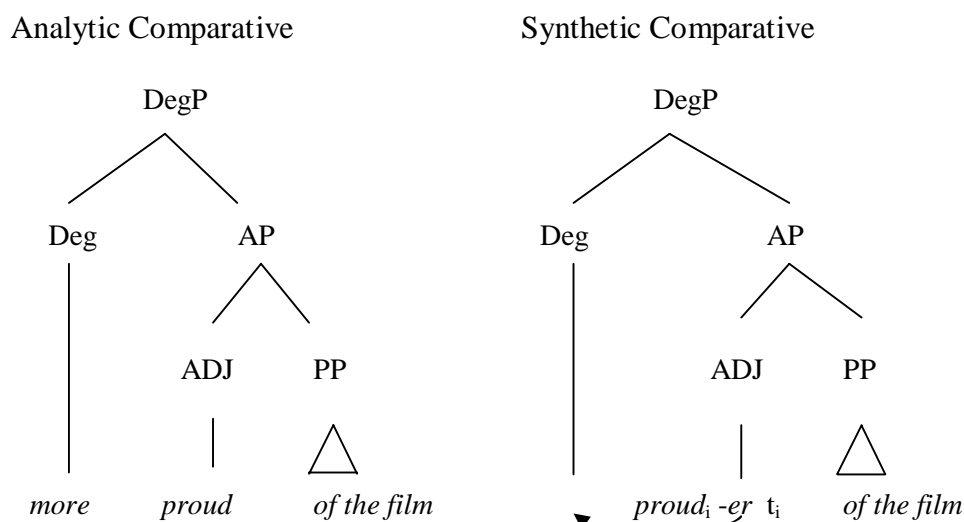


Figure 3. Phrase structure of analytic and synthetic comparatives

Early recognition of phrase structure is thus assumed to maximise processing speed and minimize processing effort.

#### 4.1 How can we define and measure analyticity?

Analytic Support, however, is not restricted to ordering advantages. Other cases of morpho-syntactic variation and synthetic-analytic contrasts can also be observed to display a pattern in which an analytic variant is comparatively preferred in cognitively complex environments.

When operationalizing the best-known definition of analyticity by Greenberg (1954: 192), who divides the number of morphemes by the number of words (Syntheticity = morphemes/words), we obtain the syntheticity values shown in Table 1<sup>6</sup>. Thus, *fuller* is taken to consist of 2 morphemes or 1 word. Dividing the number of morphemes (2) by the number of words (1), according to Greenberg's formula, we obtain a syntheticity index of 2. The analytic variant *more full*, however, consists of 2 morphemes and 2 words, which renders a syntheticity index of 1.

Table 1: Categorization of synthetic-analytic contrasts based on Greenberg's parameters including controversial cases

	synthetic ←————→ analytic	
English Comparative Alternation	full er <sup>7</sup> 2/1 = 2	more full 2/2 = 1
English Genitive Alternation	the topic 's relevance 4/2 = 2	the relevance of the topic 5/5 = 1
English Future Alternation		BE go ing to go 5/4 = 1.25
		will go 2/2 = 1
Spanish Future Alternation	comer é 2/1 = 2	IR a comer 3/3 = 1
German Mood Alternation	bliebe 3/1 = 3	würde bleiben 4/2 = 2

However, syntheticity values are less clear-cut as soon as we start acknowledging all grammatical properties encoded in the variants. For this reason several studies, such as Schwegler (1990: 48), Szmrecsanyi (2009) and Haspelmath (2009) set up different syntheticity or agglutination parameters. Nübling (2010: 3) provides a thorough discussion of the problems involved in measuring syntheticity and she convincingly argues for a whole range of parameters that need to enter the classification, among them syntagmatic parameters (such as concord), paradigmatic parameters (such as the number and similarity of available allomorphs) and even the frequency of a grammatical construction as a whole. As an example, consider the English *BE going to* future, which would at first sight be classified as analytic. In the Greenbergian system, the syntheticity value of 1.25 is, however, more synthetic than that for *will* (1.0). This somewhat puzzling decision derives from the morphologically complex word *go/ing*, while the fact that *BE* needs to minimally display person and number agreement with the subject is not represented at all in the formula. Similarly, *will* raises the issue of how to account for the fact that it is highly idiosyncratic by not overtly inflecting for person and number, given that syncretism is one of the factors that a syntheticity index needs to account for according to Nübling (2010: 20). This also relates to the question of how a syntheticity value should deal with zero morphemes, portmanteau

morphs, etc. And finally, *will* could be classified as more synthetic than *going to* on phonological and morphological grounds. It can be reduced to a single phoneme /l/ and it can be attached to a free morpheme (*I'll, he'll*, etc.), while *going to* has more phonological substance and more morphological autonomy.<sup>8</sup>

Similarly, for the Spanish future alternation we would have to acknowledge the fact that the verb (*comer/é* 'will eat') is inflected for person and number in the same fashion as the forms of *ir* 'to go' in *voy a comer, vas a comer*, etc.

Another type of variation patterns involves a zero option in competition with explicit marking (cf. Eitelmann 2012; Rohdenburg 2009). Assuming a wider conception of syntheticity and analyticity, even these variables could be included on this cline, though the Greenbergian measure would rank the more explicit variant as more synthetic.

(3) As I approach the flats I don't try to hide myself.

At school I used to read, mostly, and hide  $\emptyset$  in the shed at dinnertime (...). (BNC)

(cf. Eitelmann 2012)

	synthetic ←	→ analytic
English Reflexive Alternation	oneself 2/1=2	$\emptyset$ 0/0 = 1 <sup>9</sup>

Drawing on Schwegler (1990: 48), Nübling (2010: 6) argues that measures of syntheticity need to incorporate a whole range of parameters as well as syntactic, semantic morphological and phonological interdependencies. Morphological and phonological syntheticity parameters indicate whether individual units can be separated, fused, moved, stand in isolation, whether they are obligatory, as well as their structural and semantic transparency (cf. Nübling 2010: 6). For instance, semantic syntheticity can be illustrated for particle verbs.

(4) Sie sollten ihren Familienstand angeben.

Sie gaben ihren Familienstand an.





In-depth studies of the factors constraining the choice of genitive variants have, for instance, revealed that certain complexity factors trigger a higher ratio of *of*-genitives (cf. Rosenbach 2003: 392), so that we can similarly deduce the following correlation:

high processing load	⇒	higher ratio of <i>of</i>
low processing load	⇒	higher ratio of -'s

Rosenbach (2003: 392) shows that possessors that express new information score significantly higher on *of*-genitives than those expressing given information (cf. also Biber et al. 1999: 305f; Quirk et al. 1985: 1282).<sup>10</sup> In line with Rosenbach (2003: 392) we can argue that newness increases the processing load and that this distribution might form another case of an explicit variant mitigating cognitive complexity, in this case triggered on the pragmatic level by information status.

#### 4.3 Analytic Support with abstract rather than concrete uses

With Walker and Hulme (1999: 1258) we define concreteness “as an index of how directly the referent of a word can be experienced by the senses” (cf. also Mondorf 2009a: 91-93). Studies reveal considerable unanimity among subjects who were asked to rate words as concrete or abstract. While *ball* and *ship* are clearly assigned to the concrete category, *logic* and *conscience* have been classified as abstract (cf. Gilhooly and Logie 1980).

For semantic complexity we are in the lucky position of having ample independent psycholinguistic evidence showing that abstract words are harder to process than concrete words. Firstly, Moss and Gaskell (1999) report shorter reaction times for concrete than for abstract words. Secondly, EEG measurements (cf. Weiss and Rappelsberger 1996: 17f) show that concrete words are easier to memorize and retrieve. This processing difference is attributed to the fact that concrete nouns refer to objects that can be perceived via highly diverse channels (seeing, hearing, feeling, smelling or tasting). Thirdly, neurophysiological

studies report the simultaneous activation of more and more widely spread sensory-based features when using concrete rather than abstract nouns. And finally, serial recall of concrete nouns is more accurate than that of abstract nouns.

(...) concrete words benefit from a stronger semantic representation than do abstract words and (...) the quality or strength of a word's semantic representation contributes directly to how well it can be recalled. (Walker and Hulme 1999: 1261)

In accordance with these findings, empirical analyses in Mondorf (2007: 219) have revealed that semantic complexity triggers higher ratios of Analytic Support, as illustrated by the following examples.

(5) the beer is bitterer (The Daily Telegraph 1994)	concrete
the more bitter takeover battles of the past (The Daily Telegraph 1991)	abstract

For this study, seven adjectives were selected, because they were equal in length and sufficiently numerous in matching concrete and abstract uses. Given the scarcity of comparatives in general and of semantic contrasts in highly specific matching contexts in particular, even megacorpora comprising more than 900 million words proved to fall short of qualifying as a useful database, which is why retrieval by means of Google was chosen. The vast quantity of resultant entries (with over 22,000 entries for *a dark colo(u)r*) meant that the general procedure of manually editing each entry had to be abandoned for the sheer reason of economy. Instead, waste entries were minimized by searching for the exact strings e.g. "*a more round face*" and "*a rounder face*" using the quotation mark option in Google. Another problem for using web data is that search strings can occasionally render crucially different constructions ("a cleaner room" provides instances of the genitive "a cleaner's room" in Google), a problem that did, however, not occur with the noun combinations

analyzed in the present study. What remains is the general messiness of web data, which includes doublets and errors. In order to restrict the amount of non-native data wherever possible, the search was restricted to English language domains. When evaluating the results in Figure 4, it is important to bear in mind that according to the vast majority of grammar books the *more*-variant should not occur at all with these monosyllabic adjectives. The vertical axis provides the percentages for the *more*-variant. The ratio for e.g. *more round* is higher with abstract uses of the adjective *round* than with concrete uses. Thus, *a more round number* scores 24% (leaving only 76% for the synthetic variant *a rounder number*) but *a more round face* is used in 4% of the cases (leaving 96% for the synthetic variant *a rounder face*).

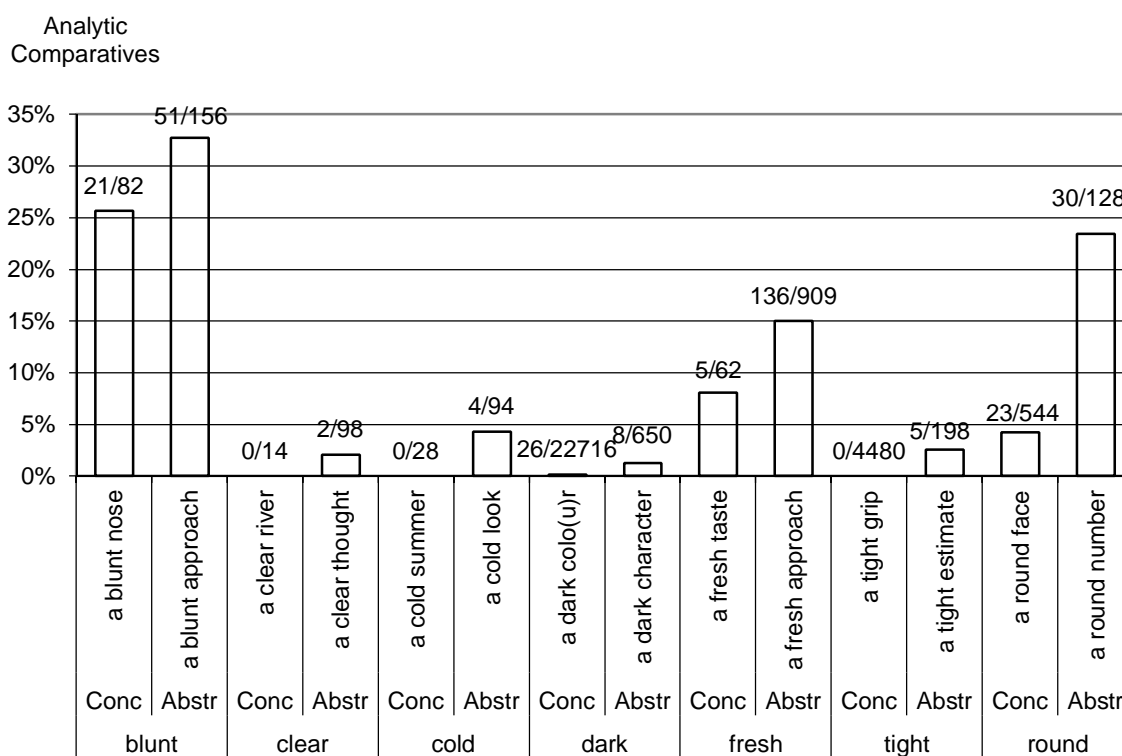


Figure 4: Analytic comparatives of concrete vs. abstract adjectives (Number<sub>Analytic</sub> = 311)<sup>11</sup> (taken from Mondorf 2007: 219)

Confirmatory findings on these semantic complexity effects are also reported in a very sophisticated psycholinguistic follow-up study by Boyd (2007: 77).

The distribution indicates that for all seven adjectives the use of the *more*-variant is higher with abstract than with concrete concepts. Semantic complexity can thus be shown to trigger Analytic Support.

#### 4.4 Analytic Support with negated rather than affirmative contexts

Another determinant that has been shown to condition the choice between synthetic vs. analytic variants in both Spanish and English is negation. Independent psycholinguistic evidence has largely confirmed that negation is cognitively more complex than affirmation, leading to delayed statement verification (cf. Wason 1961) and delayed picture verification (cf. Gough 1965; MacDonald and Just 1989: 641; Slobin 1966). This processing difference has repercussions on grammatical variation.<sup>12</sup>

For Mexican Spanish, Lastra and Butragueño (2010) report a statistically significant increase of the analytic variant (*voy a comer*) from 91% in affirmative to 96% in negated sentences.

(6) Comeré.	affirmative context
No voy a comer	negated context

For English mood alternation, language users can express irrealis by choosing the synthetic variant (i.e. the subjunctive is marked by a zero-inflected verb form as exemplified in *have-∅* in (7)) or the analytic form, which uses a periphrastic modal instead (e.g. *would have*). The analytic subjunctive is reported to be favoured in negated contexts in Schlüter (2009: 300) – a fact that might at least partly be attributed to the proclivity to analytic variants in negated contexts.<sup>13</sup>

(7) (...) on the condition that he have-∅ in-home aides (...)	affirmative context
(...) on the condition that he would <u>not</u> have to work (...) (COCA)	negated context

The increased processing effort associated with negated contexts appears to be mitigated by the choice of analytic variants in both Spanish and English.

As regards the distribution of *will* and *BE going to*, the categorization into synthetic vs. analytic is less straightforward, as Table 1 and the discussion in section 4.1 have indicated. On the basis of the number of lexemes involved and the degree of cliticization *will* is considered the synthetic variant, while *BE going to* is rated as more analytic, since it includes several portmanteau morphemes, which increase its morpheme to word ratio. As regards the factors determining the choice between both future variants, negation is one of at least three cognitively complex environments that have been shown to trigger higher ratios of the analytic *BE going to*. Negated contexts generally increase the ratio of the *BE going to*-variant as opposed to the synthetic *will*-future (cf. Szmrecsanyi 2003: 316).<sup>14</sup>

- (8) (...) if you'll provide the contact information, I'll check his story out. affirmative context
- (9) If she's not gonna provide the information he wants, this is not going to make a prosecutor happy (...). negated context<sup>15</sup>  
(COCA)

All findings concur that – in line with the Complexity Principle and more specifically with the Principle of *Analytic Support* – the more explicit/analytic variant (*BE going to*) is favoured in negated, i.e. cognitively complex, environments.

#### 4.5 Analytic Support with low frequency rather than high frequency words

In German the periphrastic perfect (*Sie hat gebraucht ...*) has increasingly replaced the preterite (*Sie brauchte ...*). One of the few environments in which the decrease of the synthetic preterite is delayed is extremely frequent verbs, i.e. well-entrenched verbs that exert a lower processing load than rare verbs (cf. Jäger 1971). Similar frequency effects have also been observed for English comparatives, where the analytic *more*-variant is chosen

more often with extremely rare adjectives than with highly frequent ones (cf. Mondorf 2009a: 40-3).

#### 4.6 Analytic Support with complements rather than adjuncts

Given the high degree of dependency between an adjective and its complement(s), it has been argued in Mondorf (2009a: 57-79) that the presence of complements triggers a higher share of analytic comparatives than its absence.

- (10) Never have I felt more proud to be a conservative. + infinitival complement  
(The Guardian 1994)  
I'd be even prouder if John Cleese were in it somewhere. - infinitival complement  
(The Guardian 1992)

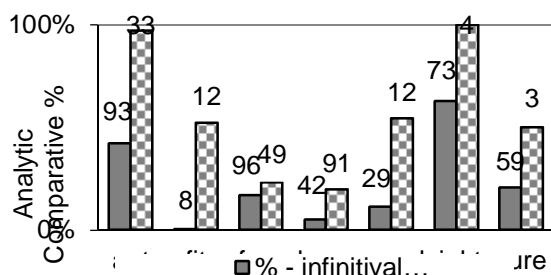


Figure 5. Analytic comparatives of monosyllabic adjectives in non-attributive position +/- infinitival complement (Number<sub>Analytic</sub> = 1047) (Based on Mondorf 2009a: 65)

Figure 5 summarizes corpus-based findings which reveal that all adjectives increase their use of the analytic variant in the presence of a complement. This has been attributed to the higher processing demands effected by the strong dependency relations between an adjective and its complement in Mondorf (2002). Follow-up studies using judgement tasks as well as reaction-time experiments have found that comparatives plus infinitival

complements produce shorter reaction times if the comparative is formed analytically than if it is formed synthetically (cf. Boyd 2007: 27-32).

At a Symposium on Determinants of Grammatical Variation, Jack Hawkins (p.c.) raised the following question: It would be interesting to see if complements but not adjuncts raise the use of the *more*-variant. If the strength of dependency relations between an adjective and its complement are responsible for Analytic Support, adjuncts should not trigger Analytic Support to the same extent as complements, since obligatory complements express necessary information complementing the adjectives' meaning, while adjuncts merely convey additional optional information. Consequently, the presence of complements should increase the processing load, but the presence of adjuncts should not. We are now able to answer this question by taking a closer look at *than*-phrases.

Quirk et al. (1985: 462) list *than*-phrases exemplified in (11) among adjectival complements rather than adjuncts:

(11) Delays are the worst in a decade and planes are more full than ever. (COCA)

However, several aspects cast considerable doubt on their complement status: First, generative approaches portray *than*-phrases as licensed by the degree marker rather than the adjective (cf. Haumann 2004), an analysis which would imply that they are not part of the adjective phrase. Consequently, we would not expect *than*-phrases to trigger *more*-support, because they are semantically and syntactically less dependent on the adjective. What is more, corpus findings presented in Mondorf (2006: 593) show that Quirk et al.'s (1985: 462) claim that monosyllabic adjectives take the analytic form "more easily when they are predicative and are followed by a *than*-clause" must be attributed to their predicative use alone. And indeed, there is ample corpus evidence showing that *than*-phrases do not significantly affect comparative alternation (cf. Hilpert 2008: 407; Leech and



Culpeper 1997: 367; Lindquist 2000: 129; Mondorf 2002: 74, 2009: 123-126). They do not behave like complements, simply because they are adjuncts; and in line with these findings we can now answer Hawkins' question in the positive: The strength of semantic and/or syntactic dependency relations determines whether Analytic Support does or does not take place. While complements trigger Analytic Support, adjuncts (in our case *than*-phrases) do not.

## 5 The historical development

English has often been cited as a language that has developed from synthetic to analytic, so we could expect that the degree of competition between both variants is declining. Others have claimed that as regards comparatives, this typological tendency appears to have been reversed in English (cf. Kytö and Romaine 1997: 344).

While it is a truism that no language can be described as completely synthetic or analytic, even for individual structures, this question can be less clear-cut than expected (e.g. the *going to* vs. *will* future). But even duly assuming that syntheticity and analyticity are a matter of degree, we are faced with problems in operationalizing these highly pervasive concepts.<sup>16</sup> Any meaningful account of syntheticity needs to move beyond the Greenbergian parameters in order to account for the number and diversity of dependencies that exist on the syntagmatic and the paradigmatic levels, etc.

While the situation appears to be more straightforward for English with its highly isolating features – at least at first sight –, the treatment of morpho-syntactic alternation patterns indicates that we are merely looking at the tip of the iceberg. When zooming in on the actual distribution of synthetic vs. analytic comparatives throughout the history of English, any claims stating that the English language or English comparative formation has developed

from synthetic > analytic or vice versa turn out far too coarse to grasp the systematic variation that has evolved throughout the last four centuries.

### 5.1 Less frequent adjectives have come to require Analytic Support

A corpus-based study of the diachronic development of Analytic Support with comparatives has revealed that monosyllabic adjectives and disyllabic ones in <-y> (*heavy, lucky*, etc.) have increased their ratios for the synthetic variant since around 1600 up to Present-day English. Fifteen other groups of formally defined adjectives (e.g. those ending in *-ful, -ure, -ous, -ward, -some*, etc.) have increased their share of analytic variants in the past four centuries. This development has culminated in a situation in which most morphological groups of disyllabic adjective types are knock-out contexts for the synthetic comparative variant (cf. Mondorf 2009a: 128f). The only two groups of adjectives that have decreased their share of the *more*-variant over time are monosyllabic adjectives and disyllabic ones in <-y>. What these have in common is that they are also the most frequent groups, as Figure 6 indicates.

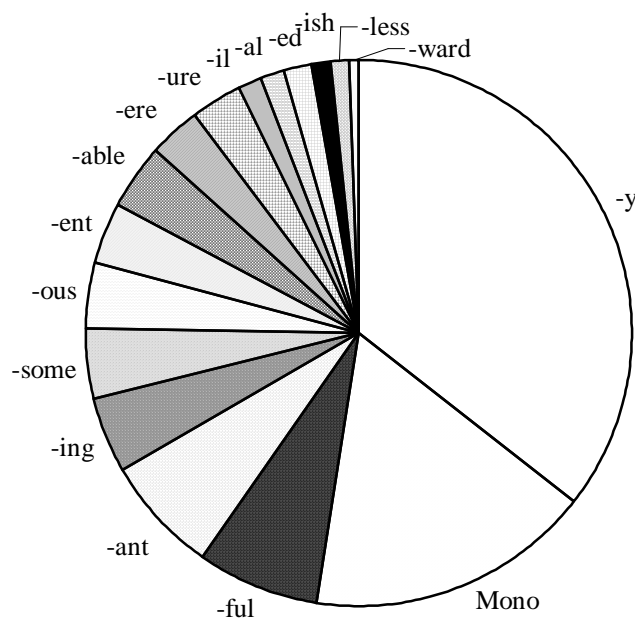


Figure 6: Token frequency of comparatives (both synthetic plus analytic) with different groups of adjectives (Number = 12166) (Based on Mondorf 2009a: 131)

Being short and highly frequent, it is argued in Mondorf (2009a: 130), the two adjective groups do not require Analytic Support to the same extent as rarer adjectives. This data also indicates that lumping all adjectives together conceals a systematic division of labour in which short and highly frequent adjective types have come to favour the synthetic comparative, while other adjective groups have become 100% analytic.

## 5.2 Analytic Support with syntactically complex comparatives emerged after the 18th century

In addition, the diachronic analysis presented in Mondorf (2009a: 161-164) has revealed that the preference of the *more*-variant for syntactically complex environments has not always been around in the English language. It is only after the 18<sup>th</sup> century that the analytic variant increases in the presence of complements. Figure 7 provides the ratio of analytic comparatives in the absence of complementation (solid line) in contrast to the presence of complementation (dashed line) for eight adjectives.<sup>17</sup> It is only in the 18<sup>th</sup> century that the

division of labour emerges and analytic variants come to be preferred in syntactically complex environments.<sup>18</sup>

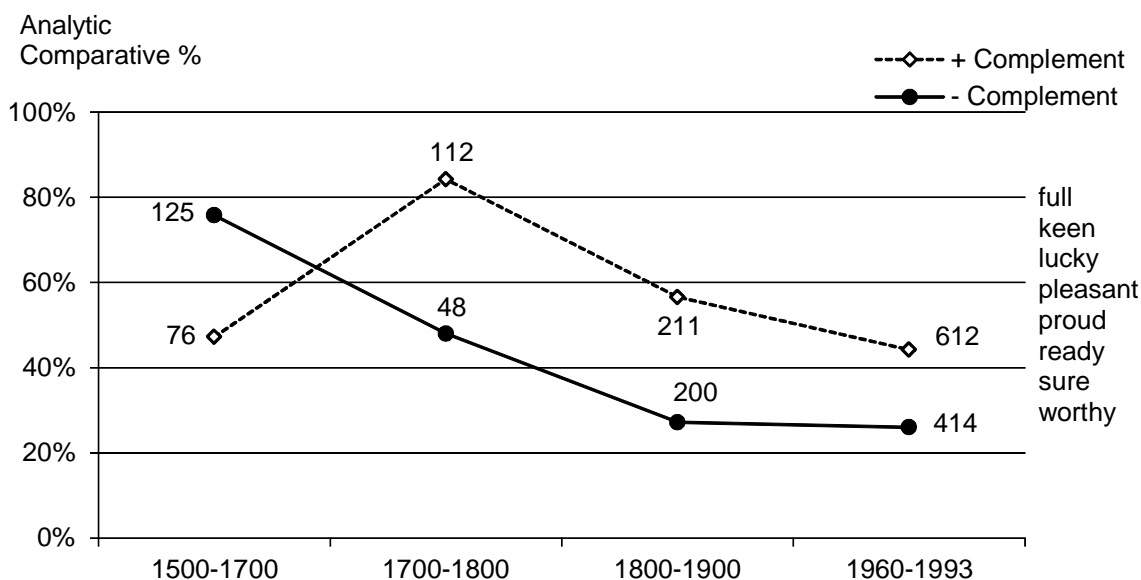


Figure 7: Diachronic development of analytic comparatives according to the presence/absence of complements (Number<sub>Synthetic + Analytic</sub> = 5987) (Based on Mondorf 2009a: 160)

## 6 Competing motivations or division of labour?

By drawing on descriptive variation linguistics and approaches based on typological and psycholinguistic principles, we arrive at a processing-based explanation for the systematic similarities within a range of six morpho-syntactic alternations from three languages, i.e. English comparative alternation, English mood alternation, English genitive alternation, English and Spanish future alternation and German mood alternation. The Principle of Analytic Support provides the common denominator for a series of individual – at first glance unrelated – variation phenomena that are affected by processing demands exerted by syntactic, semantic or pragmatic complexity.

By linking Hawkins' (1994) processing theory, typological syntheticity measures and Rohdenburg's (1996) Complexity Principle, the following cline for Analytic Support can be postulated:



Figure 8. Cline for Analytic Support

Research on morpho-syntactic variation reveals that what appears to be competing motivations at first glance turns out to be part of an intricately systematic adaptation to processing demands resulting in a division of labour between both variants. Syntheticity is favoured in comparatively easy-to-process contexts. Analyticity is resorted to in cognitively more demanding contexts, thereby mitigating processing effort. This division of labour must have developed some time after the 18<sup>th</sup> century in English.

The historical development of morpho-syntactic alternation patterns observed for six synthetic-analytic contrasts raises the question of why, for instance, the English language has not long ago settled the conflict between synthetic and analytic variants by promoting one variant to the detriment of the other. After all, in other areas, the system has established purely analytic rather than synthetic marking, as, for instance, in case marking (with the exception of the genitive). Why did this streamlining not take place in the area of English comparatives, genitives or subjunctives?

My suggestion is that the English language has, in fact, settled the conflict – in the form of an emergent division of labour. The outcome, i.e. that the analytic variant is required in harder to process environments is hardly surprising if we assume that analytic structures are able to mitigate the processing load. It appears to be the case that languages retain morpho-syntactic alternations in order to optimally exploit the system.

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- <sup>1</sup> In contrast to Guerrero Medina (2011), the term morpho-syntactic alternation is here taken to refer to variation involving a morphological and a syntactic variant, rather than covering the variation between either two morphological variants (which is more appropriately termed morphological variation) or two syntactic variants (i.e. syntactic variation).
- <sup>2</sup> A vital and controversial issue that – to my knowledge – has not yet been solved, is whether analyticity/explicitness is apt to reduce processing costs in production or in comprehension. It has occasionally been assumed that syntheticity is speaker-friendly by primarily catering for the needs of the speaker/writer (input-economical), while analyticity mainly benefits the listener/reader (output-economical) (cf. Szmrecsanyi 2009: 322). Pending further psycholinguistic research the present paper is deliberately non-committal in deciding whether analytic forms are preferred in order to decrease processing costs for the speaker/writer, for the hearer/reader, or for both. A possible experimental design would have to place some processing burden on speakers and see if their ratio of analytic forms increases.
- <sup>3</sup> Note that what is at stake here are relative frequencies. If analytic variants are claimed to be preferred in hard-to-process environments, this does not imply that their ratio is higher than that for synthetic variants, i.e. that they are the majority variant, but that their ratio is higher than it would be in easier-to-process environments.
- <sup>4</sup> Figure 1 presents an overview of 24 factors investigated in Mondorf (2009a: 197), with the factors “style” and “lexical persistence” being supplemented here in accordance with findings reported by Mondorf (2009b: 100-5) and Szmrecsanyi (2005).

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- <sup>5</sup> For the crucial question of determining in which cases *-er* and *more* can be conceived of as functionally equivalent, readers are referred to Mondorf (2009a: 11-3).
- <sup>6</sup> In Greenberg's (1954) typology, languages in the range between 1 to 1.99 are classified as analytic, 2 to 2.99 synthetic.
- <sup>7</sup> A vertical line within a word indicates a morpheme boundary (|)
- <sup>8</sup> I am indebted to Matthias Eitelmann (p.c.) for calling my attention to this aspect.
- <sup>9</sup> Mathematically any division by zero renders the result 1. Whether this procedure is meaningful for computing syntheticity in languages remains doubtful.
- <sup>10</sup> Givenness is operationalized as second-mention and definite expressions (*the girl, his father*) vs. first-mention and indefinite ones (*a girl, some composer*). The occurrence of new information with the *of*-variant can also partly be adduced to positional preferences (cf. Hinrichs and Szmrecsanyi 2007: 452): With given information typically preceding new information, known possessors are placed first and encoded by the *-s*-genitive, while the possessed is placed last.
- <sup>11</sup> Based on retrieval of English language texts by means of Google (09.08.2004 and 12.10.2004). Apart from the figures for *blunt* and *clear*, the differences are statistically significant.
- <sup>12</sup> For English, syntactic variation phenomena involving the choice between a marked *to*-infinitive vs. a zero-variant also show that negated contexts trigger higher ratios for the explicit variants than affirmative contexts (cf. Horn 1978: 191-205; Rohdenburg 2008). The percentage for *help to* in negative contexts amounted to 87% (34 cases) in negated



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contexts, while in general its share was merely 43% in British newspaper data.

(a) She helped me  $\emptyset$  make a hash of things. affirmative contexts

(b) She helped me not to make a hash of things. negated contexts

(based on Rohdenburg 2008)

<sup>13</sup> A possibly related aspect contributing to the preference of modal periphrasis according to Schlüter (2009: 299) is the *Embedded Negation Constraint* by Horn (1978: 191), according to which “[t]he less the dependent clause looks and acts like a sentence (...) the less negation is admitted without corresponding discomfort, if it is admitted at all.”

<sup>14</sup> The other two contexts are dependent rather than independent clauses and longer rather than shorter sentences (cf. Szmrecsanyi 2003: 316).

<sup>15</sup> Note that an example using the contracted forms (the clitic *'ll* and *gonna*) would be even better suited to illustrate the synthetic-analytic contrast.

<sup>16</sup> An in-depth treatment of the pitfalls in defining these concepts in German is found in Nübling (2010: 1), who comes to the conclusion that once we take the measurement of syntheticity seriously, there is “not much evidence that German has become a more analytic language”.

<sup>17</sup> The curves are additionally labelled with the absolute numbers of occurrences in order to indicate whether the numbers are large enough to permit the deduction of meaningful claims.

<sup>18</sup> For a more detailed account of the historical development of comparative alternation, cf. Mondorf (2009a: 117-70).