

From language-specific constraints to implicational universals

A cognitive-typological view of the dative alternation

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This article seeks to shed more light on the well-studied, yet still challenging, dative alternation. It starts from the cognitive-typological suggestion of Croft (2001, 2003) that language-internal variation is subject to the same constraints as cross-linguistic variation (the semantic map model), and that careful language-specific research may therefore reveal facts about language in general. I argue that there is a parallel between dative alternation and passivisation. Then, using a sample of active tokens from the British National Corpus of ditransitive *give* in both the indirect-object and double-object constructions and comparing these to a matched sample of passive examples, I evaluate the effect on passivisation — and hence dative alternation — of the semantic parameters proposed in previous scholarship. The results are stated as a set of implicational universals. They should hold for all languages that feature the alternation, and make diachronic predictions as well. In addition to the semantics — which has been discussed in many previous studies — I argue that token frequency also plays a role in promoting dative alternation — which has never been suggested before. The conclusion identifies some general implications for theoretical linguistics and for the practice of research on language structure and meaning.

1. The problem

The dative alternation, exemplified in (1), below, is a well-studied phenomenon. For overviews of scholarship see e.g. Levin (1993:45–48) or, less extensive but more recent, Gries (2003).

- (1) a. John gave a gift to Mary.
- b. John gave Mary a gift. (Gropen *et al.* 1989:204)

The prepositional construction in (1a) will henceforth be referred to as the indirect-object construction (IOC), and the construction illustrated by (1b), as the double-object construction (DOC).

Determinant factors of the alternation have been analysed along two orthogonal dimensions: (i) the cross-linguistic vs. language-specific dimension and (ii) constraints on the verb type vs. the choice of one construction over the other in discourse. The present article sets out to investigate both language-specific and cross-linguistic constraints on the alternation, which, in line with the cognitive-typological approach to language of e.g. Croft (2001, 2003), are treated as two sides of the same coin.¹ The article is not concerned with the choice of a particular construction in discourse.

Typological work on the dative alternation has mostly focused on the variation in constructions across languages for the encoding of two objects, see e.g. Siewierska (2003), Haspelmath (2005). Some work has also been carried out on what determines the availability of the patterns in a given language. Givón, for example, citing evidence from English, Hebrew, Sherpa, Indonesian and KinyaRwanda has argued that the “grammaticalisation to DO, if occurring at all, is governed by the hierarchy of topicality” (1984:163):

BEN > DAT > ACC > LOC > INSTR > OTHERS

While this makes certain predictions as to which verbs, in a given language, may display the dative alternation, the semantic roles of the hierarchy are fairly general labels. Research on specific languages — where English has very much been the focus — suggests that the topicality hierarchy is not fine-grained enough to account for all the facts of the dative alternation.

A considerable body of language-specific research on the dative alternation investigates speakers’ choice between IOC and DOC in running discourse. Various factors related to morphophonological weight and information structure (e.g. definiteness, topicality) have been shown to play a role, see e.g. Allerton (1978), Arnold *et al.* (2000), Givón (1984), Gries (2003), Hawkins (1994), Panther (1997), Polinsky (1998), Ransom (1979), Thompson (1990). As this article is not concerned with choices in discourse, I will not discuss this scholarship in any detail. Incidentally, the DOC construction itself has two variants (at least when both objects are pronominal), one with the recipient (REC) preceding the theme (TH), as in (1b) above, the other, with the two objects in reverse order, e.g. *John gave it her*. Variation here is determined by various factors, including again weight and discourse status but also regional dialect; see e.g. Siewierska and Hollmann (2007) and Gast (this volume) for an overview and discussion.

In previous work on verb-type restrictions on the dative alternation, scholars have been especially puzzled by the fact that semantically similar verbs such as

give vs. *donate*, *send* vs. *transport/carry/push/pull*, *tell* vs. *shout/report* may vary in their behaviour:

- (2) John donated the painting to the museum.
- (3) *John donated the museum the painting. (Groefsema 2001:525)

Some have taken this as an indication that while in a very general fashion there is a semantic constraint underlying the alternation — described by Levin as “change of possession, where possession is rather broadly construed” (1993:48) — there must be other factors at work as well. Specifically, Gropen *et al.* (1989), Mazurkewich and White (1984), Oehrle (1976), Pinker (1989), Storm (1977) and Stowell (1981) have argued that within the class of change of possession predicates there is a morphophonological or etymological constraint as well. (Goldberg 1992 argues for such a constraint, too, but her view of the role played by the semantics is more sophisticated than the constraint presented above — see below for discussion.) The suggestion is that, for example, *give* but not *donate* allows dativisation because it is monomorphemic/monosyllabic and of Germanic not Latinate origin. *Donate*, by contrast, is not monosyllabic or even polysyllabic with initial stress — which is the Germanic pattern; compare the dativisability of *promise* and *offer*, both of which are also of Latinate stock but have been assimilated to the native stress pattern.

With respect to these semantic and morphophonological/etymological constraints, Groefsema (2001:528–29) points out that none of the proposals accounts for all the data. Indeed, a quick glance at the list of dativisable verbs compiled by Levin (1993) shows that there are cases of monomorphemic and monosyllabic verbs of Latinate origin that do occur in DOC, e.g. *lease*, *pay* and *serve*, and that there are also cases of Latinate verbs that do not conform to the Germanic stress pattern yet may dativise nonetheless, e.g. *advance*, *allot*, *assign*, *award*, *bequeath*, to name but a few. Groefsema also observes that there are undativisable verbs whose meaning and morphophonological properties would nonetheless seem to make them candidates for dativisability on the traditional accounts of the authors mentioned above (not including Goldberg (1992)), viz. *shout*, *scream*, *pull*, *push*, *lower*, *entrust*, *credit*, *supply*, *choose*, *pick*, *select* (2001:529). Another problem Groefsema identifies is that whether the morphophonological/etymological constraint applies or not ultimately depends again on the semantics of the verbs involved. Consider for example that the verbs *bequeath*, *refer*, *recommend*, *guarantee* and *permit* form a class of verbs of ‘future having’ (2001:529, see also the summary on p.533). She concludes, rightly to my mind, that morphophonology/etymology should be disregarded.

Groefsema argues that the solution to the problem of accounting for the distribution of DOC lies in a refinement of the semantic constraint. She labels her

specific proposal the Unique Effect Constraint: “for a verb to occur with both syntactic frames [viz. IOC and DOC], each one has to encode an effect which is not linguistically realised by any other VP” (Groefsema 2001:536–37). Let me illustrate the constraint in relation to *give* vs. *donate*. Groefsema suggests that *give* encodes a different effect on REC when in DOC as compared to IOC. This is widely accepted: the semantics of the two constructions with *give* are commonly analysed as follows (see e.g. Gropen *et al.* 1989:241, Goldberg 1992:45–46):

IOC → ‘X causes Y to go to Z’
 DOC → ‘X causes Z to have Y’

In DOC, then, REC is causally affected in a way that it is not in IOC, which instead focuses on the effect on TH. The idea is that this meaning difference supports the availability of the two constructions for the verb *give*. *Donate* is different, Groefsema suggests, as its function is to ascribe a special status, i.e. that of being a donation, to TH. Given the focus on the status of TH, *donate* does not occur in DOC, which after all would focus more on REC, and “the effect on the recipient in an act of donating does not differ from that in an act of giving” (Groefsema 2001:542).

The Unique Effect Constraint is problematic, as it is not easy to decide in a principled way which verbs may describe a special effect on TH, and which verbs may code a special effect on REC. Regarding *donate*, the case does not look convincing. One could argue that this verb encodes a situation where REC is especially reliant on gifts, and is perhaps expected to be more grateful than in a typical act of giving. The common collocation of *donate* with the noun *charity* as in example (4), below, taken from the British National Corpus,² supports the suggestion that our frame knowledge of acts of donating does include a special effect on the recipient: we know that charities can only exist by virtue of donations, and are in that sense more profoundly affected than the recipient in an ordinary act of giving.

- (4) Any readers who want to collect aluminium cans can either send them to me or contact local scrap metal dealers and take them there, where they can then donate the cash to a charity of their own choice. (BNC A17 1220)

The semantic dimension of Goldberg’s (1992, cf. also 1995) account of dative-ability is more sophisticated than other research on the phenomenon. Rather than proposing one single constraint, she argues that the DOC construction has a certain central meaning associated with it, i.e. ‘Subj successfully causes Obj1 to receive Obj2’ (Goldberg 1992:56). Core members of the class of dative-able verbs are fully compatible with this meaning, but various extensions are also possible (see e.g. Taylor 1995, Croft and Cruse 2004 for the prototype-based view of semantics implicit here). Her proposal, including some but not all of the extended senses of DOC, is summarised below:

- Central sense: Subj successfully causes Obj1 to receive Obj2
 Verb classes:
- i. inherent acts of giving: *give, hand, pass, feed*
 - ii. punctual causation of ballistic motion: *throw, toss, slap, kick, poke, fling, shoot*
 - iii. verbs of continuous causation in a deictically-specified direction: *bring, take*
- Extended senses: satisfaction conditions imply: Subj causes Obj1 to receive Obj2
 verbs of giving with associated satisfaction conditions: *guarantee, promise, owe*
 Subj intends to cause Obj to receive Obj2
- i. verbs involved in scenes of creation: *bake, make, build, cook, sew, knit*
 - ii. verbs of obtaining: *get, grab, win, earn*
- (adapted from Goldberg 1992:56)

Goldberg's account is descriptively adequate for the facts of present-day English. However, the extended senses all seem to be on a par, and so she would still have to explain why the scope of DOC was extended to certain verbs before others; consider for example that *owe* (*agan*) was already dativisable in Old English (Visser 1973:621) while e.g. *bake* and *build* were not.³ In addition, Goldberg's proposal cannot straightforwardly account for some dativisability facts of other languages in which the alternation is found, even if the language in question is a closely related one such as Dutch:

(5) *Jan beloofde Marie een nieuwe fiets.*
 'J. promised M. a new bike.'

(6) ?*Jan bakte Marie een cake.*
 'J. baked M. a cake.'

(7) ?*Jan bouwde Marie een huis.*
 'J. built M. a house.'

2. Theoretical perspective and methodology

2.1 Cognitive-typological linguistic theory

Despite the shortcomings in terms of diachronic and cross-linguistic applicability, Goldberg's (1992) — and others' — semantic analyses do make reference to uni-

versally valid semantic properties, such as volitionality of the agent (AG), volitionality of REC, and unity of time. The present article starts from the assumption that on the basis of these kinds of universal semantic parameters it is possible to devise an account of dativisability that is valid across time and across languages (that is, of course, languages where the alternation occurs).

Underlying this assumption is the cognitive-typological approach to language exemplified by e.g. Croft (2001, 2003). This approach takes an essentially universalist position on conceptual structure and cognitive processing. In other words, speakers of different languages share the same conceptual system, and the same set of cognitive abilities that allow them to interact with their environment, which includes language structure and meaning. Variation across languages occurs because different languages conventionalise different ways for the grammar to code aspects of the conceptual space, and these conventionalisations are subject to change. The variation is nevertheless constrained by the (cognitive) requirement that conceptually adjacent notions are more likely to be coded in a similar manner than conceptually distant ones (cf. e.g. Croft 2001:96). The diachronic manifestation of this principle is that extensions of a given linguistic expression (construction) are only possible if they are in the direction of conceptually adjacent conceptualisations (this is part of what Croft labels “diachronic typology” or “the dynamicisation of typology”, where typological hierarchies and implicational universals are essentially reinterpreted as grammaticalisation clines, see especially Croft 2003: Chapter 8). In technical terms, the language-specific ways in which regions of the conceptual space are covered by linguistic expressions (constructions) are semantic maps. The traditional typological term for the constraints on cross-linguistic variation in the mapping of linguistic form onto function is implicational universals, and the diachronic typological view is that these universals are the synchronic manifestation of grammaticalisation clines (cf. especially Croft 2003:244ff.). Over the past two or three decades the semantic map model has become increasingly important in functional-typological linguistics: see also Anderson (1974, 1982, 1986, 1987), Croft *et al.* (1987), Croft and Poole (2004), Kemmer (1993), Haspelmath (1997, 2003), Kortmann (1997), Stassen (1997), Van der Auwera and Plungian (1998).

Because language-specific constraints are no more than conventionalised manifestations of cross-linguistic universals, it is possible to use language-specific facts to infer implicational universals (Croft 2001:107). This article uses data from English ditransitives to shed light on universal constraints on the dative alternation. The first step is to draw on previous scholarship to identify the semantic properties that may play a role in determining dativisability.

2.2 Dativisability and passivisability

With a list of potentially relevant semantic properties in hand, I will move on to an analysis of IOC vs. DOC in terms of these parameters. Unfortunately it is not feasible to compare the two constructions directly. This is because weight and information-structural factors also play a large role in speakers' decision to use one construction rather than the other, rendering it difficult to tease out the influence of the semantics. The evidence I will rely on instead is indirect, inasmuch as *passivisation* facts will be used to shed light on *dativisability*. There are two reasons why it is legitimate to use the former phenomenon as a window onto the latter.

The first reason has to do with the (abstract) lexical semantics of the REC argument. Specifically, according to the semantic characterisations of IOC vs. DOC presented in Section 1, REC in DOC is directly causally affected by the act of transfer, whereas in IOC s/he is not. In other words, in the transfer situation portrayed by DOC the interaction between AG and REC is semantically more highly transitive than in IOC. Significantly, research on the passive construction has shown that the interaction between AG and the undergoer tends to be semantically more highly transitive than in the corresponding active construction as well (see e.g. Bolinger 1978, Hopper and Thompson 1980, Keenan 1985, Rice 1987). It follows that there must be a parallel between dativisability and passivisability.

The second reason for assuming that there should be such a parallel is a discourse-pragmatic one. Functional models of grammar generally point to similarities between direct objects of active clauses — crucially including DOC sentences, where the direct object is the REC argument (see e.g. Givón 2001a:178) — and subjects of passive clauses. Givón argues that the competition for subjecthood and direct objecthood is determined by the discourse-pragmatic factor of topicality, where, in active transitive clauses, primary topicality will lead to coding as the subject, secondary topicality, as the direct object (2001b:198). Topicality, in its turn is related to semantic function. One version of the topicality hierarchy for direct objects along these lines was given in Section 1, above; for subjecthood an agent node would have to be added to the left of the BEN role. Different functionalist schools propose slightly different hierarchies (compare e.g. Dik's 1997:266 Subject Function Hierarchy), but they overlap considerably and illustrate the same basic insight concerning the mapping between function and structure. Since the primary motivation for using a passive is to detopicalise the agent participant of the event portrayed, the secondary topic — i.e. what would be the direct object in a transitive clause portrayal of the event — emerges as the subject (see e.g. Givón 2001b:94, 125).

For these two reasons, the question as to what semantic constraints determine dativisability can be operationalised by comparing the semantics of passive

to active ditransitives. Properties found significantly more often in the passive are not only determinants of passivisation, but by extension also of dativisation. Furthermore, given the cognitive-typological view of language espoused here and the cross-linguistic validity of the semantic parameters involved, the results for English may be used to infer implicational universals pertaining to the dative alternation.

It is important to emphasise that it would be beyond the scope of this study to not only infer these implicational universals, but to subsequently go on and confirm them against a representative sample of cross-linguistic data as well. Languages that display alternation in ditransitives are extremely rare. Siewierska's (1998) survey of 270 grammars yielded usable data for 219 languages, of which only 12 exhibited the alternating constructions. This makes it difficult to obtain the necessary data. The situation is aggravated considerably by the fact that, as also noted by Siewierska (1998:179), most grammars only report on alternation in the verb *give*. For present purposes one would obviously need surveys of most, preferably all, verbs displaying the variation (*à la* Levin's 1993 comprehensive description of alternations in English), ideally illustrated by reliable corpus examples from the languages in question. The solution would be to elicit data for the relevant languages (abandoning the idea of a genetically and geographically stratified sample Siewierska 1998:179–180 managed to identify an additional 26 languages exhibiting the alternation) and put the universals inferred below to the cross-linguistic test. For now, this must remain an idea for a promising follow-up study.

2.3 Potentially relevant semantic properties

The potentially relevant semantic properties proposed in previous scholarship are six. I briefly discuss them below, illustrating the different values with examples from the British National Corpus, all involving the verb *give* (about which, more later).

The first property is the nature of the transfer. Goldberg (1992:51), Goldsmith (1980), Gropen *et al.* (1989:222 and *passim*), Mazurkewich and White (1984:264), Oehrle (1976) and Stowell (1981) argue, more or less explicitly, that there is a difference between a situation where REC actually ends up as being the possessor of a concrete TH, and where transfer is merely abstract or intended. The idea is that concrete transfer makes the situation more amenable to being portrayed by DOC than does abstract/intended transfer:

Hierarchy 1: concreteness of TH

concrete transfer > abstract/intended transfer

Groefsema adds a further dimension to the nature of the transfer, i.e. whether it is permanent or temporary (2001:538). She does not clearly link this to the notion

of dativisability, but since REC in cases of permanent transfer can be said to be affected more than if transfer is but temporary, we may hypothesise that this dimension is connected:

Hierarchy 2: permanence of transfer

permanent transfer > temporary transfer

The two hierarchies may be integrated as follows:

Hierarchy 3: combining concreteness of TH and permanence of transfer

permanent concrete > temporary concrete transfer, > temporary abstract/intended
 transfer permanent abstract/intended transfer
 transfer

The following examples from the BNC illustrate the different values (apart from intended transfer, which *give* cannot be used for): (8) describes the permanent transfer of a concrete TH, (9) the temporary transfer of a concrete TH, (10) the permanent transfer of an abstract TH, and (11) the temporary transfer of an abstract TH.⁴

- (8) She was polite, she gave me a small box of chocolates with a thank-you card and kissed me and shook my hand when she came for a meal on Sunday. (BNC A0U 1389)
- (9) It gave me a temporary Equity card — mind you they took it away again as soon as I had done the four weeks work. (BNC A06 1809)
- (10) In other words he opened up the circles, squares and longways sets to show what gave rhythm and life to the movements. (BNC A12 1151)
- (11) She gave me a half-smile.⁵ (BNC A0F 907)

The second property is punctuality (Pinker 1989:273):

Hierarchy 4: punctuality

punctual transfer > non-punctual transfer

Example (12), below, illustrates punctual, (13), non-punctual transfer.

- (12) “Oui,” she said, and gave him the folded note. (BNC A0L 3516)
- (13) Richard Rampton QC, read out a draft of a speech which Lord Aldington gave in March 1985 to the pupils of Winchester College where he was Warden. (BNC A49 185)

Goldberg actually includes both punctual and non-punctual transfer in her DOC prototype (1992:57), but it is important to note that this stage of the investigation

is meant to be as unrestrictive as possible: limitations on what properties are important in determining dativisability will fall out of the data analysis later on.

The third semantic factor is volitionality of AG (Gropen *et al.* 1989:244, Goldberg 1992:46, 58–61):⁶

Hierarchy 5: volitionality of AG

volitional AG > non-volitional “AG”

Example (14), below, features a volitional AG, while (15–16) have non-volitional subjects (which for that reason strictly speaking should not be termed agents):

- (14) “With his left hand he snatched the gun from the Pole’s hands, and with his right he gave him a violent blow to the ear.”(BNC A05 1445)
- (15) In either case, the absence of colour gave an incentive to the authors to provide evocative descriptions. (BNC A04 713)
- (16) Rivonia gave immortality to the men it jailed for life. (BNC A4X 250)

The fourth parameter is volitionality of REC:

Hierarchy 6: volitionality of REC

volitional REC > non-volitional REC

REC in example (17) is clearly volitional (especially since the preceding context makes it clear that if *she* does not rake the grass, a sudden thundershower may render it unusable), while in (18) it cannot be:

- (17) He gave her the rake and she went vigorously at the hay while he plaited a grass rope to put round a burden and heft it down to the byre. (BNC A0N 1978)
- (18) This gave greater depth to most of the patterns, but often made the dancers appear earthbound. (BNC A12 1768)

There is some confusion as regards the exact meaning of the term volitionality in Goldberg’s account: she sometimes refers to a volitional REC as a “willing recipient” (1992:46, 61–62), but reluctant REC participants also qualify:

- (19) Bill gave the driver a speeding ticket. (Goldberg 1992:62)
- (20) Chris gave Bill a kick. (*ibid.*)

Volitionality, then, is defined as the *ability* to be willing to receive something, see also Goldberg’s suggestion that “all cases where the first object is required to *accept* the transferred object in order for transfer to be successful imply that the first object is assumed to be a willing recipient” (1992:62; emphasis in the original). This

essentially means that volitional REC participants are human or at least sentient beings. Thus, the parameter is actually interpreted in terms of animacy. In this study I have chosen to adopt the more narrow definition of volitionality as real willingness. This does have the disadvantage of there being room for subjective judgment — can we always infer reliably whether someone wants something or not? — but as I show in Section 2.4, ambiguous cases are dealt with in a principled fashion.

The fifth semantic property is spatiotemporal contiguity, i.e. whether or not the giving and receiving are carried out in the same space and at the same time.⁷ Groefsema (2001:537) only recognises spatial contiguity:

Hierarchy 7: spatial contiguity

unity of space > spatial remove

Goldberg (1992:56) only considers temporal contiguity:

Hierarchy 8: temporal contiguity

unity of time > temporal remove

Thompson and Koide (1987:401–402), by contrast, mention both. Spatial and temporal contiguity are interrelated, and are indeed often integrated in the functional-typological literature (see e.g. Givón 1990:520–26, 2001b:44–50). The hierarchy then becomes:

Hierarchy 9: spatiotemporal contiguity

unity of time and space > unity of space / temporal remove, > spatiotemporal remove

spatial remove / unity of time

In example (21) the giving and receiving are spatiotemporally contiguous, in (22) there is temporal contiguity but a spatial remove (the British Film Institute is not in Germany), and in (23) Tchaikovsky's character performs the solo in question at a spatiotemporal remove from the act of composing the piece.

- (21) Cameron folded the paper and gave it to James Menzies. (BNC A0N 801)
- (22) The German co-producers were shocked when they found that the contract for *Melancholia* gave this right to the BFI, since in Germany final cut is almost always given to the director. (BNC A4S 241)
- (23) Tchaikovsky was the first to break that mould when he gave the Sapphire Fairy (now one of Florestan's sisters) a solo to a 5/4 time signature. (BNC A12 145)

The sixth potentially relevant semantic parameter mentioned in the literature concerns the question as to whether the verb foregrounds the transfer (as in *give*), or the manner of motion. Gropen *et al.* (1989:226), citing Talmy (1985), Levin (1985) and Pinker (1989), suggest that in many languages manner of motion verbs such as *throw*, *toss*, *kick* and *flip* do not develop a transfer meaning, as a result of which they cannot dativise either.

Hierarchy 10: foregrounded aspect of transfer

transfer foregrounded > manner of motion foregrounded

Example (24), below, illustrates the use of a verb, *throw*, that foregrounds manner of motion:

- (24) From its windows a crowd, led by John & Zcaron;ižka [*sic*], threw the anti-Hus councillors to the crowd below, who promptly lynched them. (BNC AE8 1311)

2.4 Sampling procedure and method of analysis

I restricted the analysis of active vs. passive ditransitives to the verb *give*. This verb allows speakers to describe transfer events that vary along all of the parameters listed above, except for the values ‘intended transfer’ and ‘manner of motion foregrounded’. I collected examples from the BNC of *gave*, *was given* and *were given*. The tense-aspect value was kept constant because it is known to have an effect on semantic transitivity (cf. Hopper and Thompson 1980).

I extracted the first 100 examples of *was given* and the first 100 of *were given*. Together, these yielded 128 examples with a REC subject. In order to acquire a roughly equal number of active clauses, I extracted 500 tokens of *gave*. The first 200 tokens already contained 82 examples of DOC. IOC proved considerably less frequent: the full 500 tokens I analysed contained 67 examples. The sum total of 149 active clauses with *give* was close enough to the total of 128 passive clauses for my purposes.

The inclusion of both DOC and IOC in my sample follows from the theoretical approach adopted here. From a generative perspective one would perhaps argue that the passive is more likely to be a transformation of DOC than of IOC, in which case the sample of active sentences need not have included IOC. But transformations are not part of the cognitive-typological approach, and so it is impossible to say whether the passive corresponds more closely to DOC or to IOC, or to both. All three possibilities are considered in the calculations below.

To facilitate the comparison of active and passive clauses equal size samples were created. I balanced the definiteness of the AG and REC participants in the

Table 1. Samples used for passive vs. active comparison

sample type	passive vs. active	passive vs. DOC	passive vs. IOC
sample size	119 (i.e. of each)	79	54

samples, such that there was an equal number of active and passive sentences with a definite AG and a definite REC, an equal number with an indefinite referential AG and a definite REC, and so on. The reason for this precaution is that Hopper and Thompson (1980) argue that definiteness is among the factors determining semantic transitivity. The sizes of the resulting pairs of samples to be compared are shown in Table 1.

These samples might not seem very large, but they were large enough to allow interesting results to emerge from the statistical analysis — see Section 3.

The corpus examples were analysed in terms of the first five parameters outlined in Section 2.3. For bivalent hierarchies, an example displaying the higher value received a score of 1 for that parameter, while the lower value was rated 0. Thus, sentence (12) above was scored 1 for punctuality, and (13) was scored 0. For trivalent hierarchies, the values were 0, 1 and 2. Example (8) was rated 2 for the nature of transfer, (9–10) were rated 1, and (11) was rated 0. The fact that the top of the rating scale here is higher than for bivalent hierarchies does not matter, as the statistical test used is not sensitive to absolute values, only relative ones (i.e. the ranking). Indeterminate, ambiguous cases were consistently classed as the lower value. For instance, it is not easy to decide whether Bunty in example (25) below is a willing recipient of the sharp look, or a very reluctant one. Tokens like this receive the lower score, i.e. 0.

(25) She gave Bunty a very sharp look.

Using the values for all passive vs. active examples (either split up into DOC and IOC or taken together), I applied the Mann-Whitney U-test (one-tailed;⁸ see e.g. Butler 1985:98–102) in order to determine whether there was a statistically significant difference between the two samples. The U-test is appropriate because it does not ascribe any absolute value to the intervals on the scales used. For example, it does not assume — as indeed our linguistic theory would not warrant us to — that the difference in transitivity between examples (8) and (9–10) above is *exactly* the same as that between (9–10) and (11). Instead, all it assumes is that (8) is more highly transitive *by some indeterminate amount* than (9–10), which in turn are more highly transitive *by some indeterminate amount* than (11). This is another way of saying that the U-test is sensitive to rankings not absolute values.

3. Results and discussion

Tables (2–4) present the U-scores and significance levels for all five parameters investigated, for all three active vs. passive samples.

Table 2. Comparison of passive and active (DOC +IOC)

	transfer	punctuality	volitionality AG	volitionality REC	spatiotemporal contiguity
U-score	8508.0	8362.0	9508.5	7080.5	7261.5
significance (one-tailed)	$p < .01$ highly sign	$p < .01$ highly sign	$p < .01$ highly sign	p appr. 5 not sign	$p > .35$ not sign

Table 3. Comparison of passive and active (DOC)

	transfer	punctuality	volitionality AG	volitionality REC	Spatiotemporal contiguity
U-score	3853.5	3634.0	3752.5	3397.0	3274.5
significance (one-tailed)	$p < .01$ highly sign	$p < .01$ highly sign	p appr..01 significant	$p > .15$ not sign	p appr..3 not sign

Table 4. Comparison of passive and active (IOC)

	transfer	punctuality	volitionality AG	volitionality REC	spatiotemporal contiguity
U-score	1492.0	1635.0	1890.0	1512.0	1508.5
significance (one-tailed)	$p > .4$ not sign	$p > .1$ not sign	$p < .01$ highly sign	$p > .35$ not sign	$p > .35$ not sign

The pretty solid statistical significance of nature of transfer, punctuality and volitionality, across the three ways of comparing active vs. passive ditransitive clauses, suggests that these are indeed determinant factors of passivisability of ditransitives — and by extension of dativisability (see Section 2.2). Volitionality of REC and spatiotemporal contiguity, by contrast, do not have a significant effect anywhere and therefore do not seem to play any role in this relation.

Regarding cross-linguistic constraints on the kinds of verbs that may occur in DOC as against those that may not, the following implicational universals may now be inferred:

Implicational universal 1

If in a language there are differences as to whether ditransitives allow dativisation or not, then verbs on the higher end of the transfer hierarchy will be at least as dativisable as verbs lower on the hierarchy (all other things being equal).

Implicational universal 2

If in a language there are differences as to whether ditransitives allow dativisation or not, then verbs associated with punctual transfer will be at least as dativisable as verbs associated with non-punctual transfer (all other things being equal).

Implicational universal 3

If in a language there are differences as to whether ditransitives allow dativisation or not, then verbs featuring volitional agents will be at least as dativisable as verbs associated with non-volitional agents (all other things being equal).

These implicational universals are interesting in that they represent the first attempt at a description of the dative alternation that potentially has cross-linguistic validity. Furthermore, where traditional studies of the alternation have steered clear of asking any diachronic questions, in line with Croft's (2003) dynamicisation of synchronic typology (cf. Section 2.1) these universals have diachronic implications as well. For example, while in any given language that has DOC we expect it to include at least predicates denoting the permanent transfer of concrete objects, an increase in the scope of DOC in that language to include temporary transfer of abstract entities will also imply inclusion of permanent transfer of abstract entities as well as temporary transfer of concrete objects.

The universals also shed light on some classical problem cases. Consider for instance that the kinds of transfer described by *donate*, *transport*, *carry*, *push*, *pull* and *report* are probably best analysed as non-punctual, cf. Implicational universal 2. Also, the difference in acceptability in Dutch of (5) vs. (6–7) is less surprising in light of this universal: whereas baking a cake and building a house take time, promising someone a new bike is easily thought of as punctual.

In addition, some problem cases, such as *donate*, *transport*, *carry*, *push*, *pull*, *shout*, *report*, do not foreground the act of transfer itself but rather the manner. The *give* corpus data made it impossible to test the relevance of the sixth parameter proposed in the literature (see Section 2.3), but we may tentatively hypothesise a fourth constraint that would help explain these cases:

Implicational universal 4 (not substantiated)

If in a language there are differences as to whether ditransitives allow dativisation or not, then verbs whose meaning foregrounds transfer itself will be at least as dativisable as verbs foregrounding manner of motion (all other things being equal).

The cognitive-typological stance leads me to suggest that there may be yet another factor involved in dativisability, which is (more or less) independent of semantics. The usage-based model and grammaticalisation theory, which many linguists

working in the framework adopted here support, suggest that morphophonological reduction is a function of token frequency (see e.g. Zipf 1935, Bybee and Hopper 2001). Due to the absence of oblique marking DOC may be seen as a more compact, reduced version of IOC. If this is correct, then ditransitive predicates with a high token frequency have an advantage over those with a low token frequency in terms of their ability to occur in DOC. There is some support for this. First, contra Wasow's (1981) suggestion that novel transfer verbs sound natural in DOC (e.g. *I satellited him a message*), Croft *et al.* (in prep.) present evidence from several Germanic languages to show that acceptance in DOC is by no means immediate (using *fax*, *e-mail*, *text*): using an apparent time-depth methodology this study finds that older speakers are more reluctant to accept novel transfer verbs than younger speakers. It may be that some threshold frequency must be reached before these verbs occur in DOC. Second, there is evidence from child language acquisition that children commonly overextend DOC with the verb *say* (e.g. *Don't say me that*, Gropen *et al.* 1989:239), which is very frequent. To the extent that this evidence is convincing, a fifth implicational universal may be inferred:

Implicational universal 5

If in a language there are differences as to whether ditransitives allow dativisation or not, then verbs whose token frequency is relatively high will be at least as dativisable as verbs whose frequency is lower (all other things being equal).

The fact that *owe* occurred in DOC earlier than *bake* and *build* (cf. Section 1) may well be related to the lower frequency of the latter two verbs, especially in their ditransitive uses.⁹

4. Conclusion

This article has applied a new approach to the old problem of the dative alternation. Adopting the cognitive-functional view of language, I have argued (with Croft 2001:107) that the language-specific constraints on the variation between IOC and DOC shed light on the phenomenon cross-linguistically. Using data from the British National Corpus I was able to determine which of the semantic factors proposed in previous scholarship should be relevant in determining dativisability, not only in English but also in other languages. The constraints were formulated as implicational universals, and in line with Croft's notion of the dynamicisation of synchronic typology, these make diachronic predictions as well. Following Groefsema's criticism of several classical studies on the phenomenon in English, morphophonological properties were regarded as irrelevant. The constraints proposed

here are for the most part semantic, but contrary to all previous scholarship on the dative alternation I argue that token frequency may be another factor promoting occurrence in DOC. The proof of the pudding is of course in the eating, and the implicational universals inferred help explain some problems, synchronic and diachronic, in English and elsewhere, that previous scholarship cannot account for so readily.

The extent to which one may illuminate synchronic and diachronic typological patterns on the basis of synchronic data from a single language is of course limited in some ways, which means there is considerable scope for further research. Substantiation (or otherwise) of the hypothesised universals on the basis of a large sample of languages would obviously be desirable. It is not clear, either, whether the parameters proposed in the literature are sufficient, or sufficiently precise. The present study added the factor of token frequency, and there may be more. As for the level of precision of the parameters invoked, let me consider punctuality (Implicational universal 2). It is not inconceivable that speakers use a more sophisticated model of duration than is suggested by the simple punctual vs. non-punctual distinction. Conventional temporal expressions such as *a while*, *a long time*, *forever*, etc. would certainly seem to suggest as much, inasmuch as they illustrate the human capacity to conceptualise a broad range of time intervals. It may be the case that speakers make a distinction between relatively short vs. relatively long duration. It would be interesting in this connection to investigate for instance the relative chronology of the acceptance of *bake* and *build* in DOC, given that the former probably tends to occur with themes that are created faster (e.g. *a cake*) than the latter (e.g. *a house*).

This observation about predicates based on *bake* vs. *build* implies that, just like passivisability (Hopper and Thompson 1980), dativeability is properly regarded as a property of actual clauses, and only derivatively of the ditransitive verbs used in those clauses. This is interesting, as it vindicates theoretical models where constructions are taken to be primary in terms of speakers' grammatical knowledge, such as Radical Construction Grammar (Croft 2001) and some recent work in grammaticalisation theory (see especially Traugott 2003) and child language acquisition (e.g. Tomasello 2003).

This article shows that there is a lot of potential for symbiosis between traditional typological research on the one hand and corpus-based language-specific analysis on the other. Corpus-based intralinguistic research benefits from cross-linguistic validity of the notions invoked — here, the syntactic variants IOC and DOC, the semantic parameters, and the universal role of token frequency in processes of morphophonological reduction. Conversely, large-scale, often inevitably rather coarse-grained typological work may be refined considerably by corpus research on a single, well-documented language such as English.

Notes

1. An anonymous reviewer suggests that the hypothesis concerning the link between intra-linguistic research and cross-linguistically valid observations actually “goes back, within the Generative tradition, at least to Postal (1969)”. In that famous study on so-called anaphoric islands, Postal states that while his data are all from his own variety of English “it is clear that they have general if not complete cross-dialect validity”, and goes to say that “[t]he extent to which they are illustrative of true cross-linguistic principles deserves investigation” (1969:205). It is therefore unclear to what extent Postal intended his conclusions to hold for all varieties of English, much less all the languages of the world. It is easy to see why he should have been so careful as regards the general, cross-linguistic validity of his claims, as there is no clear typologically valid model of language structure and meaning underlying his study. At the date of publication of Postal’s article, the systematic study of cross-linguistic variation, and constraints on that variation, was a relatively new enterprise — Greenberg’s (1963) being the pioneering work. Moreover, within the Generative tradition the notion of Universal Grammar was still very much in its infancy: Seuren (1998:279–285) dates the concern with cross-linguistic validity in Generative linguistics to the 1970s. In contrast to Postal’s study, the present article, like Croft’s work, is grounded in the semantic map model (see Section 2.1, below), which is widely accepted in typological circles. Note that as a model to describe typological facts, there is now some dissatisfaction with Universal Grammar even within Generative circles, see Newmeyer (2005). For these reasons I would distance the present study from the Generative tradition more than the reviewer may seem to wish.
2. The BNC is a 100-million-word corpus of spoken and written present-day English; for more information see e.g. Aston and Burnard (1998).
3. Some scholars make a distinction between the dative alternation and the benefactive alternation, where the oblique object in the English IOC is linked with the preposition *for* not *to* (e.g. Levin 1993:45–49). For the purpose of this article I will follow the less fine-grained approach of e.g. Goldberg (1992) in grouping them together.
4. Examples (8–24) below are only meant to illustrate the values of the various semantic dimensions. In selecting examples I have first and foremost paid attention to their transparency in terms of exemplifying the semantic value in question. Whether or not the examples display the “right” structure, i.e. DOC for values on the left-hand side of the hierarchies, and IOC for values towards the right-hand side, has not been a consideration. “Right” is in scare quotes since on the functional-typological view espoused here — in the tradition of e.g. Givón (1980) and Hopper and Thompson (1980) — it is more appropriate to speak of tendencies than of absolute constraints. Thus, for example, a given token of IOC may very well display the left-most value on a given hierarchy. The only claim would be that given a sufficiently large sample examples of DOC would display that value more often. Section 3 presents the quantitative evidence regarding the extent to which this claim is upheld. As explained in Section 2.2, this study uses an indirect method, involving passivisation.
5. I am grateful to an anonymous referee for pointing out that strictly speaking TH is a second-order entity (an eventuality of some kind) rather than an abstraction, i.e. third-order entity. All examples of second-order entities in my data were classified as abstract entities.

6. In distinguishing volitional from non-volitional agents the definition of AG adopted here is quite broad. Other definitions are of course possible. Talmy (2000:473), for example, reserves the term for volitional instigators whose actions have the intended outcome, using *author* for volitional instigators whose actions have some unintended outcome (*I broke the vase in (with my/by) rolling the ball into it*) and *instrument* for non-volitional instigators (*A ball broke the vase in (by) rolling into it*).

7. An anonymous reviewer suggests that spatiotemporal contiguity must overlap to some extent with punctuality (see hierarchy 4, above). While it is perfectly possible to keep these notions logically distinct, it may indeed be that in practice spatiotemporally contiguous events are more often punctual than non-contiguous events. This is therefore an interesting suggestion meriting further research, but here I will simply note that as far as I am aware the two parameters are never integrated in the functional-cognitive and typological literature.

8. The reason why the U-test was employed as a one-tailed not two-tailed test is that I assume that the data are patterned *directionally*, that is to say, the data are studied from the perspective of the hierarchies presented in Section 2.3, which are essentially predictions as to the relation between structure and meaning. If it had not been possible to make any such predictions, a non-directional (two-tailed) test would have been appropriate. This basically means that the differences between the samples compared would have had to be larger in order for them to be deemed statistically significant. For more elaborate discussion see Butler (1985:72–74) or any other introductory statistics textbook.

9. An anonymous reviewer argues that in addition to token frequency the semantic role of the non-thematic object argument of the verb played a role as well, the idea being that since it is a benefactive in the case of *bake* and *build* but REC in the case of *owe* would have promoted attraction to the DOC construction for the latter. To the extent that this analysis of the participant roles is correct this is plausible. The analysis may be supported on structural grounds, as in IOC the arguments in question are linked to the preposition *for* in the case of *bake* and *build* but to *to* in *owe*. Semantically, however, these arguments in *bake/build* have some claim to REC status as well: change of possession of the TH is not necessarily less likely in these verbs than in *owe*. This situation illustrates the well-known fact that participant roles are often not clearly distinguishable; see in this connection Langacker's (1987:328) suggestion that to try and maintain strict distinctions between similar roles is not a very useful exercise.

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