Explaining the Ditransitive Person-Role Constraint:
A usage-based approach[1]

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Abstract

In this paper, I propose a frequency-based explanation of the Ditransitive Person-Role Constraint, a cross-linguistic generalization that can be formulated as follows: "Combinations of bound pronouns with the roles Recipient and Theme are disfavored if the Theme pronoun is first or second person and the Recipient pronoun is third person." This constraint is well-known from Spanish and other Romance languages: *Alicia se lo mostrará.* 'Alicia will show it to her.' (3rd theme, 3rd recipient), but ** Alicia te le mostrará.* '...you to her.' (2nd theme, 3rd recipient).

The theoretical literature offers a number of explanations of this constraint (e.g. in terms of structural positions, a clash of positional alignment requirements, or markedness), but none can account for the fact that it is both widely found in the world's languages, independently of morphosyntactic factors like case-marking peculiarities, and non-universal (some languages are shown to violate the constraint).

My own proposal starts out from the observed correlation between allowed grammatical patterns and frequency in language use. In languages that lack bound pronouns and therefore cannot be subject to the constraint, we see a significant skewing in the frequencies of various person-role combinations. Combinations with 1st/2nd Recipient and 3rd Theme greatly outnumber combinations with 3rd Recipient and 1st/2nd Theme, although the latter do occur occasionally. This performance-grammar

correspondence can be explained on the basis of a principle of language change that I call the *Frequency Condition on Entrenchment in Grammaticalization*. It says that when a loose combination of expressions becomes entrenched and is conventionalized as a separate construction, which particular elements may figure in the construction often depends on their frequency of occurrence.

I go on to explain in semantic-pragmatic terms why certain combinations of Recipient and Theme are rare, and I show that grammaticalizations of these usage preferences are more widespread than current discussions of the Ditransitive Person-Role Constraint imply.

1 Definitions and examples

The goal of this article is to explain the Ditransitive Person-Role Constraint, a universal preference disfavoring certain ditransitive construction types involving bound object pronouns whose effects can be observed in many languages. This preference can be formulated as in (1) (the role labels Recipient and Theme are defined later in this section).

(1) **The Ditransitive Person-Role Constraint (DPRC) (weak version)**[2]

Combinations of bound pronouns with the roles Recipient and Theme are disfavored if the Theme pronoun is first or second person and the Recipient pronoun is third person.

The ungrammaticality of constructions with such clitic pronoun clusters in the Romance languages has been known for a long time (e.g. Meyer-Lübke 1899: §378), and analogous restrictions have also been reported from other languages such as Slavic and Balkan languages. In (2-4) as well as in further examples below, the (a) sentence shows a well-formed combination of clitic pronouns, and the (b) sentence shows an ill-formed combination. (The notation "($n > m$)" is to be read as "nth person Recipient, mth person Theme".)

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[2] Besides the "weak" version given here and discussed in most parts of the paper, there are also three "stronger" versions; see §6.4 below.

(2) French (e.g. Grevisse 1986: §657 (b) 1°)

(2a) (1 > 3) Agnès   me   la   présentera.

              Agnès   1SG.REC   3SG.F.THM   present.FUT.3SG

              'Agnès will introduce her to me.'

(2b) (3 > 1) *Agnès   me   lui   présentera.

              Agnès   1SG.THM   3SG.F.REC   present.FUT.3SG

              'Agnès will introduce me to her.'

(2c)   Agnès   me   présentera   à   elle.

              Agnès   1SG.THM   present.FUT.3SG   to   her

              'Agnès will introduce me to her.'

(3) Modern Greek (Anagnostopoulou 2003: 252-3; cf. also Warburton 1977)

(3a) (2 > 3) Tha   su   ton   stílune.

              fut   2SG.REC   3SG.M.THM   send.PF.3PL

              'They will send him to you.'

(3b) (3 > 2) *Tha   tu   se   stílune.

              fut   3SG.M.REC 2SG.THM   send.PF.3PL

              'They will send you to him.'

(3c)   Tha   tu   stílune   eséna.

              fut   3SG.M.REC send.PF.3PL   you.OBL

              'They will send you to him.'

(4) Bulgarian (Hauge 1999 [1976]; cf. also Vasilev 1969)

(4a) (3 > 3) Az   im   ja   preporâčvam.

              I   3PL.REC   3SG.F.THM   recommend.PRES.1SG

              'I recommend her to them.'

(4b)　　(3 > 2)　　*Az　　im　　　　te　　　　　　　　　preporâčvam.

　　　　　　　　　　I　　　3PL.REC　　2SG.THM　　　　　　recommend.PRES.1SG

　　　　　　　　'I recommend you to them.'

(4c)　　　　　　　　Az　　te　　　　preporâčvam　　na　　tjah.

　　　　　　　　　　I　　2SG.THM　　recommend.PRES.1SG　　to　　them

　　　　　　　　'I recommend you to them.'

The restrictions in these languages are clearly of a formal-syntactic, not of a purely semantic nature. From a semantic point of view, there is nothing wrong with the (b) sentences of (2-4): If a circumlocution with a free pronoun is used instead of a combination of two bound pronouns, as in the (c) examples, perfectly grammatical sentences result.

The above examples involve easily segmentable "clitic" pronouns, but the effects of the DPRC have also been observed in languages with affixal marking of both Recipient and Theme. Such languages typically exhibit gaps in their morphological paradigms at the relevant positions. Since Addis (1993) and Bonet (1994), it has been recognized that the ban on certain clitic clusters (as in 2-4) and the gaps in morphological paradigms (as in 5-7) represent the same phenomenon. The term "bound pronoun" in (1) should be taken in a broad sense, subsuming affixal pronominal markers[3] as well as clitic pronouns.[4]

(5) Standard Arabic (Fassi Fehri 1988: 116)

(5a)　　(1 > 3)　　ʔaʕṭay-ta-nii-hi

　　　　　　　　　　give-2SGM.SUBJ-1SG.REC-3SGM.THM

　　　　　　　　'You gave it/him to me.'

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[3] Affixal object person/number markers are never pure agreement markers but can always convey pronominal information on their own if no full noun phrase is present (see Siewierska 1999).

[4] A recent trend in the study of clitic pronouns in the Romance and Balkan languages has been to argue that the traditional "clitics" are in fact affixes, and that the restrictions on pronoun clusters fall in the domain of morphology rather than syntax (e.g. Kaiser 1992, Bonet 1995, Miller & Sag 1997, Miller & Monachesi 2003). Since I do not make any specific assumptions about the properties of morphology and syntax, this issue can be left aside in the present paper.

(5b) (3 > 2) *ʔaʕṭay-tu-huu-ka

give-1SG.SUBJ-3SGM.REC-2SGM.THM

'I gave you to him.'

(5c) ʔaʕṭay-tu-hu ʔiyyaa-ka

give-1SG.SUBJ-3SGM.REC ACC-2SGM

'I gave you to him.'

(6) Basque (Addis 1993: 448-49; cf. also Albizu 1997)

(6a) (3 > 3) Edu-k neska Toni-ri aipatu d-io.

Edu-ERG girl.ABS Toni-DAT mention 3THM-3REC.3AG

'Edu has mentioned the girl to Toni.'

(6b) (3 > 1) *Edu-k ni Toni-ri aipatu n-io.

Edu-ERG I.ABS Toni-DAT mention 1THM-3REC.3AG

'Edu has mentioned me to Toni.'

(6c) Edu-k ne-re aipamena Toni-ri egin d-io.

Edu-ERG I-GEN mentioning Toni-DAT do 3THM-

3REC.3AG

'Edu has mentioned me (lit. made mentioning of me) to Toni.'[5]

(7) Kera (East Chadic; Ebert 1979: §5.1)

(7a) (1 > 3) Yaak-an-dǝn.

leave-1SG.REC-3.THM

'(He/she) leaves it/them to me.'

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[5] In Basque, a circumlocution with free pronouns is not an option for rescuing sentence (6b), because the ditransitive verb obligatorily agrees with all three arguments, including free pronouns. Thus a different circumlocution has to be chosen. Addis (1993) discusses further possible circumlocutions.

(7b)   (3 > 1)   *Yaak-an-dù.

                 leave-1SG.THM-3SG.M.REC

                 '(He/she) leaves me to him.'

(7c)   Wə   yaak-an   á   tó.

            he   leave-1SG.THM   to   him

           'He leaves me to him.'

(8) Shambala (Bantu-G, Tanzania; Duranti 1979: 36)

(8a)   (1 > 3)   A-za-m-ni-et-ea.

                 3SG.SUBJ-PAST-3SG.THM-1SG.REC-bring-APPL

                 'S/he has brought him/her to me.'

(8b)   (3 > 1)   * A-za-ni-mw-et-ea.

                 3SG.SUBJ-PAST-1SG.THM-3SG.REC-bring-APPL

                 'S/he has brought me to him/her.'

(8c)   A-za-ni-eta   kwa   yeye.

                 3SG.SUBJ-PAST-1SG.THM-bring   to   him/her

                 'S/he has brought me to him/her.'

Effects of the Ditransitive Person-Role Constraint have been described for many other languages than those exemplified here. A list of additional languages and references is given in Table 1. (This list contains languages that happened to come to my attention. Since many reference grammars are not very explicit on bound-object combinations, a more systematic cross-linguistic study is not possible at present.)

Zurich German	Germanic	Werner 1999: 81
Spanish	Romance	e.g. Perlmutter 1970, 1971
Catalan	Romance	e.g. Bonet 1994: 33, 35
Italian	Romance	e.g. Seuren 1976, Wanner 1977
Romanian	Romance	e.g. Farkas & Kazazis 1980
Albanian	Indo-European	Buchholz & Fiedler 1987: 449-50
Maltese	Semitic	Borg & Azzopardi-Alexander 1997: 360
Cairene Arabic	Semitic	Broselow 1983: 281-2
Migama	Chadic	Jungraithmayr & Adams 1992: 40
Georgian	Kartvelian	Harris 1981 , Boeder 1999, Amiridze & Leuschner 2002
Hakha Lai	Chin, Tibeto-Burman	Peterson 1998
Kambera	Central Malayo-Polynesian	Klamer 1997: 903
Manam	Oceanic, Austronesian	Lichtenberk 1983: 162, 166
Yimas	Sepik-Ramu	Foley 1991: 210
Monumbo	Torricelli	Vormann & Scharfenberger 1914: 53
Warlpiri	Pama-Nyungan	Hale 1973: 334
Takelma	Penutian	Sapir 1922: 141-142
Ojibwa	Algonquian	Rhodes 1990: 408
Passamaquoddy	Algonquian	Leavitt 1996: 36
Southern Tiwa	Kiowa-Tanoan	Allen et al. 1990, Rosen 1990
Kiowa	Kiowa-Tanoan	Adger & Harbour forthcoming
Tetelcingo Nahuatl	Uto-Aztecan	Tuggy 1977

Table 1: Additional languages exemplifying the Ditransitive Person-Role Constraint

Bonet (1994: 40) concludes from its widespread attestation that the constraint is universal, but we will see below (§2.4) that it is only a preference, not a strict universal constraint.

The name "Ditransitive Person-Role Constraint" which I have chosen was inspired by Bonet's (1994) term "Person-Case Constraint".[6] I have added "ditransitive", because there is also an analogous monotransitive constraint on person-role associations, disfavoring straightforward combinations of third person agents and first or second person patients in some languages (see §6.4). And I have replaced "case" by "role", because semantic roles are more easily comparable across languages than cases. Thus, the effects of the constraint are by no means restricted to languages such as French whose clitic pronouns can be said to bear dative case (for Recipient) and accusative case (for Theme). In some languages, different cases are used for Theme and Recipient pronouns (e.g. absolutive for Theme in Basque, and genitive for Recipient in Modern Greek), and many languages have no case-marking at all and still show the effects of the DPRC. A less language-particular solution would be to formulate the universal preference in terms of syntactic functions such as "indirect object" and "direct object", but these cannot be identified in all languages either (see Dryer 1997 on the language-particular nature of syntactic functions). The most obvious problem for a description in terms of a "direct object/indirect object" distinction is the fact that some languages with DPRC effects (e.g. Ojibwa) operate with a "primary object/secondary object" distinction (Dryer 1986).

On the other hand, using narrow semantic role terms such as "patient" or "recipient" does not work very well either, because languages generally treat other argument types in the same way as true patients and true recipients. For practical purposes, I use the notions Theme and Recipient, which have to be understood as macro-roles (hence the

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[6] Another term sometimes found in the literature is "*me lui* constraint" (e.g. Perlmutter 1971, Laenzlinger 1993, Ormazabal & Romero 1998).

Since the DPRC is a cross-linguistic preference, it would perhaps be more precise to refer to it as the "Ditransitive Person-Role (Dis-)Preference". However, the use of the term "constraint" for cross-linguistic (dis-) preferences is widely known from work in Optimality Theory, so I trust that no misunderstanding will arise from this term.

capitalization),[7] so that Recipient, for instance, mostly comprises not only the recipient in the narrow sense, but also the addressee and the beneficiary, and in some languages also the causee of causative constructions.[8]

In this article, my goal is to provide a usage-based explanation of the cross-linguistic pattern described by the Ditransitive Person-Role Constraint. I do not deal with the question of the optimal characterization of language-particular grammars which manifest the constraint. Any descriptive account that states the facts correctly (such as is found in reference grammars or even pedagogical grammars) is sufficient for my purposes. Crucially, I do not claim that the Ditransitive Person-Role Constraint is represented as such (or somehow isomorphically) in speakers' mental grammars. It could be that speakers do have a constraint of similar generality in their grammars, or it could be that they simply store all permitted bound-pronoun combinations individually. For the purpose of this article, I simply remain agnostic about the form of this restriction in synchronic grammars, and I take it for granted that the language-particular DPRC effects can be acquired on the basis of positive evidence.

This research strategy is typical of functional-typological and usage-based syntactic theory (cf. Croft 1990, 2001), and sharply contrasts with generative grammar, where one typically finds a very different research strategy: When it is realized that several individual facts within a language must be related (e.g. object-verb order and genitive-noun order in

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[7] Such macro-roles have often proved useful in cross-linguistic studies. The letters A and P/O for monotransitive macro-roles are well-known from Comrie's and Dixon's work. Croft (1990:102) and Dryer (2005) extend this approach to ditransitive clauses, using the letters R and T in exactly the same sense as my "Recipient" and "Theme". (For the macro-role that is here called Recipient, one could alternatively choose the term "Goal", cf. Croft 1990:102.)

[8] One can think of Recipient as referring to expressions that have the narrow recipient role of core transaction verbs like 'give' or 'send', plus expressions that are coded in the same way and have semantically similar roles. Similarly, Theme refers to expressions that have the narrow theme role of core transaction verbs, again plus expressions that are coded in the same way and have semantically similar roles. So Recipient and Theme are concepts defined by a universal prototype. As in the well-known case of color terms, languages vary least with respect to prototypes, so such prototypes are well-suited for cross-linguistic comparison.

Japanese) because the same pattern is found in language after language, a generative grammarian proposes a modification of the formal framework that captures the cross-linguistic generalization by allowing only those languages to be described that are actually attested (thus, Chomsky and Lasnik 1993: 518 mention a "head parameter" accounting for the fact that most languages show either consistently head-initial or consistently head-final word order; the Japanese facts are explained by saying that in Japanese, the head parameter is set as "head-final"). The basic idea is that the unattested language types do not exist because they are not within the bounds of Universal Grammar, i.e. they cannot be acquired.

In this paper, by contrast, I argue for a usage-based (or functional) explanation of the Ditransitive Person-Role Constraint, and I argue against alternative explanations, especially explanations that explicitly or implicitly appeal to Universal Grammar. However, it must be noted that generative analyses of the kind mentioned in the previous paragraph typically have two components. On the one hand, they make claims about language universals, and on the other hand, they provide formal characterizations of language-particular grammars. The thrust of my usage-based theory is directed against the universal claims. Thus, with reference to the example of head-initial or head-final word order, a usage-based approach would derive the universal correlations from a theory of parsing efficiency (Hawkins 1990, 1994, Dryer 1992, Newmeyer 1998a: 105-114, 1998b), in which the notions of head and dependent play no role, and it would reject the idea that a "head parameter" is involved in explaining the word-order correlations. It is still possible that Japanese speakers represent object-verb and genitive-noun constructions in terms of a more general dependent-head schema, but the optimal language-particular characterization is not directly relevant to the usage-based explanation (see Haspelmath 2004 for further discussion). The main general point is that the limits on attested grammars do not fall out from independently needed properties of the formal framework, but are best predicted by a usage-based theory.

This limitation to the cross-linguistic patterns as the domain of theorizing does not mean, however, that the present proposal is irrelevant for the study of particular languages. If a linguist primarily wants to understand a particular language like French or Arabic and is less interested in understanding universal patterns, she still needs to separate the accidental facts of the language from the necessary ones, because there can be no explanation for the former. But the necessary facts are precisely those that are universal, and when we have an explanation for the universal patterns, this also means that their language-particular manifestations are no longer surprising. However, on this approach, understanding a language-particular pattern does not necessarily involve claims about language-particular mental grammars. It may well be, after all, that the linguists' understanding goes beyond the speakers' understanding, so that our generalizations are not mirrored by speakers' generalizations.

In the next section (§2), I will discuss earlier attempts at explaining the DPRC, and in §3 I will offer my own explanation, which is based on harmonic associations of persons and roles (based on shared animacy and topicality propensities), asymmetries of usage frequency that follow from these, and diachronic filtering of rare constructions in grammaticalization.

2 Earlier attempts at explanation

2.1. Non-explanation

Language-particular manifestations of the Ditransitive Person-Role Constraint have seemed puzzling to many linguists. Perlmutter (1971: 28) frankly states: "It is not clear why these sentences are ungrammatical", and this is echoed by Kayne (1975: 174): "The ungrammaticality of [combinations like *me lui*] still needs to be explained." Almost two decades after Perlmutter, Cardinaletti (1999: 69) finds the DPRC "still highly mysterious", and Bonet (1994: 51) is deeply pessimistic: "[W]hy should languages have such a weird morphological constraint? This question might never be answered."

Some theoretically oriented works have proposed language-particular stipulations that are not more than formal restatements of the facts. For instance, Warburton (1977: 276) posits a "positive surface constraint [±Person][–Person]" for Modern Greek clitic clusters. In her notation, "[+Person]" means first or second person, and "[–Person]" means third person, so this says that the first clitic (the Recipient) can be any person, but the second clitic (the Theme) must be third person. Warburton's constraint thus amounts to a stronger version of the formulation in (1) (see §6.4). Similarly, Miller & Sag (1997: 597) formulate the following constraint for French ("SL" stands for "slot"): "If SL-2 or SL-6 is nonempty, then SL-4 is empty." This rules out combinations like *me lui*, because *me* occupies slot 2 and *lui* occupies slot 6.

Such language-particular stipulations are clearly needed (see §2.4 below), and the question of how to formulate them best for each individual language is not devoid of interest (though it is left aside in this paper). But since so many languages have so highly similar constraints, the facts of these individual languages cannot be accidental, and a number of linguists have proposed explanations that go beyond mere restatements of the facts.

2.2. A ban on doubly filled slots

For French, structural linguists have often set up three structural slots for preverbal clitic pronouns: One for first, second and reflexive clitics (whether accusative or dative), one for third person accusative clitics, and one for third person dative clitics, as shown in (9) (see, e.g., Togeby 1982: 400, Miller & Sag 1997: 596, among many others).

(9)

ACC/DAT	ACC	DAT
me_{1SG}		
te_{2SG}	$le_{3SG.M}$	lui_{3SG}
se_{3REFL}	$la_{3SG.F\ L}$	$leur_{3P}$
$nous_{1PL}$	$les_{3P\ L}$	
$vous_{2PL}$		

According to Togeby and Miller & Sag, the reason for the ungrammaticality of clusters such as *me_{DAT} te_{ACC} 'you to me' or *$vous_{DAT}$ me_{ACC} 'me to you (PL)' is that all these pronouns must occupy the same slot, so they cannot cooccur. Emonds (1975) extends this kind of account to ungrammatical clusters like *me_{ACC} lui_{DAT} 'me to him/her' by arguing that underlyingly the clitics of the first and third slot in (9) occupy a single slot, from which only a single element can be selected.

It is of course possible that speakers arrange clitics in such slots in their mental grammars, but the question is whether anything makes this arrangement necessary. Are these particular slots innately given in Universal Grammar? If we do not want to assume this, we are led to ask: Why should languages arrange their clitic pronouns in such structural slots in the first place? My conclusion is that structural slots can provide elegant descriptions of language-particular facts, but they are themselves in need of explanation. Moreover, since no cross-linguistic generalizations about pronoun slots seem to be possible, it appears that everything about (9) that does not fall under the DPRC is simply accidental and therefore not amenable to further explanation.

2.3. The constraint is inviolable and innate

Having noted that DPRC effects are found widely across languages, Bonet (1994: 43-44) concludes that "the [Person-Case Constraint] ... has to be understood as a universal constraint which ... is ranked highest in the grammars of all languages". Since she works in

an Optimality Theory framework, this presumably implies that the constraint is considered to be innate.

While the list of languages that show DPRC effects is indeed long, there are also languages that do not obey the constraint. For instance, Polish has clitic pronouns which clearly contrast with free pronouns (e.g. *mu* vs. *jemu* 'him.DAT', *cię* vs. *ciebie* 'you.ACC'), but these clitics can be used when the Theme (i.e. the accusative object) is a first or second person pronoun, as shown in (10) (cf. also Lenertová (2001) for analogous data from Czech).

(10) Polish (Cetnarowska 2003)

(2>3)	Dałbym	Mu	cię	za	żonę	bez	wahania.
	give.COND.1SG	him.DAT	you.ACC	for	wife	without	hesitation

'I would give you to him as a wife without hesitation.'

DPRC violations are also found in languages with affixal rather than clitic object pronouns. Four examples of such languages are given in (11)-(14).

(11) Kabardian (Kumaxov & Vamling 1998: 34)

(3>2)   w-je-s-te-n-s'

2SG.THM-3SG.REC-1SG.AG-give-FUT-ASSRT

'I will give you to him.'

(12) Lakhota (Van Valin 1977: 7)

(3>2)   ni-wícha-wa-k?u

2SG.THM-3PL.REC-1SG.AG-give

'I give you to them.'

(13) Noon (Northern Atlantic, Senegal; Soukka 2000: 207)

(3 > 2)   mi   teeb-pi-raa

            I   present-3SG.REC-2SG.THM

            'I present you to her.'

(14) Haya (Bantu-J, Tanzania; Duranti 1979: 40)

(3 > 1)   A-ka-mu-n-deet-ela.

            3SG.SUBJ-PAST-3SG.REC-1SG.THM-bring-APPL

            'S/he brought me to him.'

            (or: 'S/he brought him/her to me.')

In addition, Vamling (1988: 316-17) claims that such combinations are possible in Tbilisi Georgian, contrary to what is reported in Harris (1981) (on Georgian, see also Boeder 1999 and Amiridze & Leuschner 2002).

This means that the Ditransitive Person-Role Constraint is not a universally inviolable constraint. However, it is still universal, but only as a **preference** (in the sense of Vennemann 1983, 1988), which may or may not be reflected in a given language. A preference is universal if no language manifests the opposite preference, so that it can be reformulated as an implicational universal. The implicational universal corresponding to the DPRC is formulated in (15).

(15) If a language allows some combinations of bound Recipient-Theme pronouns, the

Theme may be third person and the Recipient may be first or second person.

More informally, (15) says that no language shows "anti-DPRC effects". I know of no counterexamples to this universal. Thus, we can maintain that the DPRC is a universal constraint or preference, and we can keep looking for a universal explanation.

2.4. A clash between positional alignment requirements

Duranti (1979) and Gerlach (1998a, 1998b, 2002) offer an explanation of DPRC effects in terms of a clash between positional alignment requirements. Duranti discusses several Bantu languages (in particular Shambala, cf. (8)), and Gerlach discusses Romance and Modern Greek. In the following, I will focus on Gerlach's more recent analysis (which was apparently arrived at independently of Duranti).

The basic idea is that sentences with DPRC violations are ungrammatical because they are unable to simultaneously fulfill two conflicting requirements of ordering. On the one hand, first and second person clitics should occur on the left in clitic sequences, and on the other hand, indirect-object clitics should occur on the left in clitic sequences. This is expressed by the alignment constraints in (16) (Gerlach 1998: 47,49; 2002: [131]). (In the constraint names, "ALIGN-L" stands for 'align left', "+1" and "+2" stand for 1st and 2nd person, "+lr" effectively means 'indirect object', and CS stands for 'clitic sequence'.)

(16) ALIGN-L (+1, CS): 1st person clitics are initial in a clitic sequence.

ALIGN-L (+2, CS): 2nd person clitics are initial in a clitic sequence.

ALIGN-L (+lr, CS): Indirect object clitics are initial in a clitic sequence.

Romance and Modern Greek sentences that are blocked by a DPRC effect violate at least one of these constraints, because when the direct object is first or second person, then both the direct object and the indirect object should be in the initial position in the clitic sequence, which is impossible. In addition to the alignment constraints, Gerlach (2002: [69]) also posits a faithfulness constraint that requires an argument to be expressed morphologically as a clitic:

(17) MAX(arg)^M: An argument role has a morphological correspondent

(i.e. a clitic or an affix) in the output.

Given the constraint ranking ALIGN-L (+1, CS), ALIGN-L (+2, CS), ALIGN-L (+lr, CS) >> MAX(arg)^M, it follows that DPRC-violating clitic sequences are less optimal than

sequences in which only one clitic is realized. In the tableaux in (18), we see that the well-formed Modern Greek sequence *su ton* ('to-you him') violates none of the constraints (cf. 18a), whereas the ill-formed sequences *se tu* and *tu se* ('you to-him') violate at least one of them (cf. 18b). The candidate with only one clitic, *tu*, violates MAX(arg)$^{\text{M}}$, but it emerges as optimal.

(18) Modern Greek (cf. Gerlach 1998a: 58, 60)

a. Input:	'him to you'		ALIGN-L($+2$,CS)	ALIGN-L($+$lr,CS)	MAX(arg)$^{\text{M}}$
☞	*su ton*	('to-you him')			
	ton su	('him to-you')	*	*	
	ton	(,him')			*

b. Input:	'you to him'		ALIGN-L($+2$,CS)	ALIGN-L($+$lr,CS)	MAX(arg)$^{\text{M}}$
	se tu	('you to-him')		*	
	tu se	('to-him you')	*		
☞	*tu*	(,to-him')			*

This analysis works well for Romance and Modern Greek,[9] but it cannot explain the DPRC as a universal preference, because different languages show different orderings of Recipient and Theme pronouns, and the ordering does not correlate with the presence or absence of DPRC effects. Thus, Noon bound pronouns occur in the order Recipient-Theme but show no DPRC effects (cf. 13), whereas Shambala bound pronouns do show DPRC effects but have the order Theme-Recipient (cf. 8).

Moreover, unless a principled reason is given why only the constraints in (16)-(17) exist, Gerlach's analysis does not entail the prediction that no "anti-DPRC effects" will be found

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[9] It also works for Classical Arabic, and in fact an analysis of Arabic DPRC effects in terms of a general principle "first (and second) person precedes 3rd person" was proposed over twelve hundred years ago by Sibawaihi (d. 793) in §211 of *Al-Kitaab* (see Gensler 1998:278-80 for a translation of this passage of Sibawaihi's work, and Gensler 1998:240-45 for discussion).

in any language.[10] By positing constraints that force rightward alignment of Recipient or of first and second pronouns, one could easily describe a language with "anti-DPRC effects" that violate the universal in (15). One might be tempted to look for general principles that favor leftward alignment of recipients and first/second person pronouns, but in fact there is no evidence for a bias in the cross-linguistic distribution. Gensler (2003), in a cross-linguistic study of 31 languages with bound Recipient and Theme pronouns, found that there is no general preference for either Recipient-Theme or Theme-Recipient order.

Thus, Gerlach's (and Duranti's) analysis sheds no light on why the DPRC as a universal preference should exist.

2.5. Markedness of person and case values

Another type of explanation attempts to derive DPRC effects from the fact that in the ungrammatical combinations, both bound pronouns show a "marked" value for one feature. Thus, in French *me lui* 'me to her', *me* (1st person) shows the marked value of the person feature, and *lui* (dative case) shows the marked value of the case feature.

Grimshaw (2001: 225-227) sketches such an analysis for the Romance clitic pronouns. She writes:

> "If first and second persons, dative, and reflexive are more marked than, respectively, third person, accusative, and nonreflexive..., it turns out that the impossible combinations of clitics are those that involve marked values for case, person, and/or reflexivity." (Grimshaw 2001: 226)

This idea is implemented by positing a constraint "MARK1ST/2ND&DAT" which penalizes combinations of the marked values first/second person and dative, and which in Romance is ranked above a constraint against free pronouns. Thus, of two competing candidates like

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[10] Gerlach does make a promising suggestion in this direction, relating the constraints to two well-known hierarchies or scales: "the clitic which is high either in the animacy hierarchy ... or in the argument hierarchy ... occurs on the left edge of a clitic sequence" (2001:130; cf. 1998a:46). It is still not clear why high position on these hierarchies should correlate with initial order, and in any event, this observation is not incorporated into the formal analysis.

(2b) and (2c) from French (*me lui VERB* vs. *me VERB à elle*), the latter emerges as optimal because it only violates the lower-ranked constraint. Earlier similar approaches include Addis's (1993: 432) rather vague notion of "marking overload" and Seuren's (1976) elaborate system of "functional loads".

The basic idea behind this explanation is more interesting than an explanation in terms of positional requirements, because there is good independent cross-linguistic evidence that universally, dative is more marked than accusative, and 1st/2nd person is more marked than 3rd person (Greenberg 1966: 37-38; 44-45; Croft 1990: 92-93). There are, however, two serious problems with this approach.

First, it presupposes the contrast between a marked dative and an unmarked accusative case, which can be motivated for Romance bound pronouns, but which plays no role in languages like Arabic (5a-c above), Kera (7a-c above) or Shambala (8a-c above). For these languages, one would have to argue that Recipient pronouns are marked with respect to Theme pronouns, but the available evidence indicates that if anything, the opposite is the case.[11]

Second, the analysis seems to make the prediction that combinations with two third-person pronouns should be the most favored, whereas combinations with two non-third-person pronouns should be the least favored. Consider the markedness assignments in (19).

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[11] For instance, it is not uncommon for languages to require the Theme to be expressed as a free pronoun in ditransitive constructions. In Hausa, bound object pronouns only express the primary object (Patient/Recipient), whereas the secondary object (Theme) is expressed by free pronouns (Kraft & Kirk-Greene 1973:76):

(i)	Náa	sán = shì.		'I know him.'
	I	know = him		
(ii)	Náa	báa = shì	ítá.	
	I	give = him	it	'I gave him it.'

(19) Markedness of bound-pronoun combinations with respect to person and case:

	(A)		(B)		(C)		(D)	
	him to-her		him to-me		me to-him		me to-you	
person	u	u	u	m	m	u	m	m
case	u	m	u	m	u	m	u	m

If combination (C) is disfavored because it shows two marked values, one might expect (D) to be even more disfavored, but the opposite is the case: Some languages such as Catalan and Spanish allow (D) but rule out (C) (see §6.3 below). Also, one might expect (A) to be even more favored than (B), but there is at least one language, Kambera, that prohibits (A) but allows (B) (see again §6.3).

In general, appeals to "markedness" suffer from the lack of clarity of this concept. In Optimality Theory all kinds of well-formedness constraints are referred to as "markedness constraints", but this is a rather different concept from Jakobsonian and Greenbergian markedness as applied to morphosyntactic categories such as case or person. Grimshaw's proposal seems to presuppose that markedness values of morphosyntactic categories (or at least their combinations) automatically translate into markedness constraints, but it is not clear exactly how this connection is made.

2.6. Harmonic association of person and role scales

Finally I come to the explanation that comes closest to my own explanation of all those found in the literature. The basic idea here is that DPRC-violating sentences show a lack of harmony between two hierarchies or scales which are supposed to exhibit (what I call here) **harmonic associations**. The two relevant scales are the person scale and the semantic role scale:

(20) **person scale:**

1st/2nd person > 3rd person

semantic role scale:

Agent > Recipient > Patient/Theme

These scales are so well known from the literature (e.g. Silverstein 1976, Givón 1984: 139, Croft 1990: 104, Aissen 1999) that no further discussion is necessary here. The person scale is often presented as a sub-scale of a broader "animacy scale" (pronoun > proper noun > human > animal > inanimate). For our current purposes, only the person scale and the sub-scale "Recipient > Theme" are relevant. The two scales are the most in harmony if the first/second person pronoun is a Recipient and the third person pronoun is a Theme, and they are the most in disharmony if the first/second person pronoun is a Theme and the third person pronoun is a Recipient.

I know of three places in the literature where such an explanation of DPRC effects has been proposed. None of these studies has become widely known, and the later ones do not refer to the earlier ones.[12]

Farkas & Kazazis (1980: 78) write, with reference to Romanian:

> "[I]n the Rumanian clitic system, the case hierarchy [Ethical > Goal > Theme] and the personal hierarchy [1 > 2 > 3] are not supposed to conflict. Where there is no conflict..., the string is grammatical. Where there is strong conflict..., the sequence is unacceptable..."

And Parodi (1998: 98-99) writes, with reference to Spanish:

> "What we end up with is a joint conditioning of clitic ordering by case and person. The hierarchy of syntactic functions and argument structure [i.e. Agent > Recipient > Theme] has to be observed; the specificity hierarchy [i.e. 1/2 > 3] must be observed as well and in the same direction. The hierarchies are not allowed to cross; ... This means that in order for a sequence of

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[12] A fourth study of this type is Roegiest (1987), but his discussion (1987:152) is sketchy and not as clear as the other three authors.

two clitics to be allowed, the argument which is higher in the specificity hierarchy must have a higher position in terms of case."

Rosen (1990) is the only author who develops the idea of scale association (or "alignment") in some detail, proposing a novel formalism and two specific hierarchies for Southern Tiwa (Kiowa-Tanoan, New Mexico) (the original work on Southern Tiwa, on which Rosen's analysis is based, is reported in Allen et al. 1990). In Rosen's approach, the other scale is a relation scale, not a role scale, but the basic idea is the same:

"A salient feature of Southern Tiwa is the hierarchical principle whereby, in each clause, final term relations must align in a certain way with person/animacy categories. The categories that figure in the hierarchy are liste in [i]...

[i]   a.   Relations ...

Ergative   Dative   Absolutive

b.   Person and animacy

categories:

Sole Animate   1st/2nd person   3rd person   Inanimate

or HiSpecific" (Rosen 1990: 675)

As will become clear in §3, my own explanation also appeals to the harmonic association of person and role scales, and in this respect I am in fundamental agreement with Farkas & Kazazis, Parodi, and Rosen. There is a sense in which first and second person Recipients and third person Themes are "ideal", in all languages, while third person Recipients and first/second person Themes are "problematic". Even though these authors restrict their claims to particular languages (Romanian, Spanish and Southern Tiwa), they have in fact discovered a universal pattern, and their generalization captures what is necessary and not accidental in these languages.

However, no principled account is proposed for the directionality of the harmonic associations. Why is Recipient associated with first and second person, and Theme with third person? Why not the other way round? Rosen and Parodi have nothing to say about

this, and Farkas & Kazazis restrict themselves to a few sketchy remarks (cf. §4 below). Moreover, what is the exact connection between disharmonic association and ungrammaticality? And why is it the person and role scales, rather than other imaginable scales, that have to be in harmony? Finally, why is the ungrammaticality generally restricted to bound pronouns? In the next section, I will present a usage-based explanation that addresses all these questions.

2.7. Minimalist accounts in terms of feature checking

For the sake of completeness, I mention here a number of recent accounts of DPRC effects in minimalist terms: Laenzlinger 1993, Albizu 1997, Ormazabal & Romero 1998, 2002, Boeckx 2000, Anagnostopoulou 2003, Adger & Harbour forthcoming. None of them seems to have become widely accepted, and they are generally so complicated that it would take a lot of effort to discuss them. This paper is already very long, so I have to ignore them here.

3 A usage-based explanation

3.1. Usage-grammar correspondences

My own explanation is different from the earlier explanations in that it is explicitly proposed as a **grammar-external explanation**. I claim that we need to look at patterns of language use, more precisely frequency distributions in language use, to be able to explain the universal preference that was formulated in (1) as the Ditransitive Person-Role Constraint. The explanation thus clearly contrasts with §2.1 (stipulation), §2.2 (ban on doubly filled slots), §2.4 (clash between alignment requirements), §2.5 (markedness), and §2.6 (harmonic association of scales), which are **grammar-internal explanations** (cf. Newmeyer 1998a: §3.3-4 for a discussion of these two types of explanation). The explanation in §2.3 (innateness) is also grammar-external in a sense, but as such it is quite shallow, because we do not know

why such a constraint should be innate, and there is no independent evidence for this explanation.

Thus, I do not appeal to the "theory of grammar" or Universal Grammar in my explanation, in line with Newmeyer's (1998b) claim that typological generalizations and UG-based grammatical theory are two domains of study that are independent of each other and not directly relevant to each other. I fully agree with Newmeyer that "UG tells us what a possible human language is, but not what a probable human language is" (1998b: 164). Typological generalizations such as those that have led to the animacy/person scale and to the role scale, and likewise generalizations such as the DPRC, tell us which languages are probable, less probable and so improbable that we do not expect to find them. Universal Grammar is not relevant to explaining them.

Usage-based (or performance-based) explanations typically start out from the observation that the same kind of construction exhibits categorical grammaticality constraints in some languages and statistical preferences in other languages. For instance, Givón (1979: 26ff.) observes that many languages prohibit referential indefinite NPs in subject position, while others allow them but still show an overwhelming preference for definite subject NPs. Hawkins (1994) shows that the constituent order patterns predicted by his Early Immediate Constituents principle show up as frequency skewings in some languages and as competence restrictions in others. And Bresnan et al. (2001) observe that some languages (such as Lummi) do not allow passives with first or second person agents, while other languages (such as English) show a significantly depressed frequency of passives with first or second person agents.

The centerpiece of my explanation of the DPRC is the analogous observation that even in languages where the DPRC does not lead to the ungrammaticality of the disfavored pronoun combinations, these combinations are still much rarer than the favored pronoun

combinations. One such language is German. The parallelism between French and German is shown in (21).

(21)		favored combination	disfavored combination
	French	grammatical:	ungrammatical:
		Agnès me la présente.	*Agnès me lui présente.
	German	frequent:	infrequent:
		Agnès stellt sie mir vor.	Agnès stellt mich ihr vor.
		'Agnès introduces her to me.'	'Agnès introduces me to her.'

I will discuss the evidence for the German frequency differences in §4 and take it for granted in the following discussion.

3.2. The Frequency Condition on Grammaticalization

Functionalists have sometimes been content with pointing out usage-grammar correspondences, because they confirm the expectation that "grammars code best what speakers do most" (Du Bois 1985: 363). For instance, the grammar of French allows the most straightforward way of expressing object pronoun combinations only for the most frequent combinations. But why are grammars well-designed for the purpose of speaking and understanding? Why do they code best what speakers do most? Human beings are used to working with instruments that are well-designed for their purposes, and in the case of human-made artifacts, such good design is not surprising because the creators' plan provides the link between the purpose and the structure of the instrument. For language, there is no such plan, so we need a theory that explains how language use and language structure are connected. As Bybee (1988) (and similarly Haspelmath 1999b, Kirby 1999) has pointed out, diachronic change is the necessary link between patterns of language use and grammatical structures. Hawkins (1994) refers to the process by which performance principles are

conventionalized to become grammatical restrictions as "grammaticalization", but he does not say more about it.

There is a large body of theoretical literature that contributes to our understanding of grammaticalization (more recent works include Givón 1979, Lehmann 1995 [1982], 1993, Heine et al. 1991, Hopper & Traugott 1993, Bybee et al. 1994, Haspelmath 1999a, Heine & Kuteva 2002). However, much of this literature is not directly relevant in the present context because it deals primarily with the semantic changes that often stand at the beginning of a grammaticalization process, whereas here we are concerned with the morphosyntactic changes. The relevant type of change is the development from an independent personal pronoun with the full range of syntactic options to a bound pronoun that is phonologically (and often morphologically) reduced and is quite fixed in its syntactic possibilities (see, for instance, Givón 1976, Lehmann 1995[1982]: 41, Wanner 1987). Such a change is well-documented for most Romance and several Germanic languages and for modern dialects of Arabic, and it can be inferred for many further languages around the world. In fact, we can assume with great confidence that the vast majority of bound pronouns in the world's languages come from an independent-pronoun source (see Mithun (1996) for some exceptions). In the well-studied cases, this grammaticalization change does not lead to the loss of the old independent pronouns, but to a split: The old independent pronouns continue to exist in syntactically prominent positions (e.g. in focused position and in coordination), but in less prominent positions, especially when used as verbal arguments, the grammaticalized forms are normally used. Two schematic examples from Latin and Italian are given in (22) (small capitals mark focused constituents, which have prosodic prominence; " = " marks a clitic boundary).

(22)			Latin	>	Italian	
	a. focused position		Videunt	me.	Vedono	me.
			see.3PL	me.ACC	see.3PL	me
			'They see ME.'			
	b. ordinary		Me	videunt.	Mi = vedono.	
	argument position		me.ACC	see.3PL	me = see.3PL	
			'They see me.'			

In Italian, the independent pronoun *me* is a direct successor of the Latin independent pronoun *me*, while the grammaticalized clitic form *mi* represents a phonologically reduced innovative form with limited syntactic possibilities.

Now the central claim of my explanation is that this kind of grammaticalization process, like all grammaticalization changes, is subject to a universal constraint:

(23) **The Frequency Condition on Grammaticalization**

The more frequent a candidate for grammaticalization is relative to other competing candidates, the more likely it is that grammaticalization will take place.

This condition has been widely assumed (e.g. Traugott & Heine 1991: 8), though not yet widely discussed in the theoretical literature on grammaticalization (see, however, Krug 1998, Bybee & Scheibman 1999, Haspelmath 1999a, various papers in Bybee & Hopper (eds) 2001, Bybee 2002; Bybee 2002 calls it the "Linear Fusion Hypothesis"). There is no consensus yet on the correct explanation for the Frequency Condition on Grammaticalization, but it seems that frequency is relevant in at least two different ways: On the one hand, higher frequency of use of a sequence of linguistic expressions makes it more likely that a larger pattern comprising these expressions will be formed by speakers, and that the combination of the expressions will be entrenched and automatized. This is just a special case of the general link between memory storage and frequency of exposure to an experience that is familiar to every piano player. On the other hand, higher frequency of use

leads to greater predictability and therefore allows the speaker to reduce her articulatory effort, so that frequent expressions exhibit a greater tendency to be phonologically shortened and simplified than rare expressions (Zipf 1935). Thus, the main aspects of grammaticalization changes, tighter structures and shorter elements, can be plausibly linked to frequency.

This extremely sketchy account of the causes of grammaticalization will not persuade skeptical readers, but nothing hinges on it in the present context. All that is relevant for my explanation of the DPRC is that the Frequency Condition on Grammaticalization is a correct generalization, and that it is plausible to assume that it can be further explained in terms of general principles of human action and cognition.[13] As I mentioned earlier, the condition is widely assumed, and no counterexamples have come up so far. Evidence in favor of the Frequency Condition on Grammaticalization is very easy to find, and the following subsection will provide illustrative examples of the frequency-sensitivity of grammaticalization.

3.3. Further examples of grammaticalization processes

Depending on the nature of the competing candidates, two different ways in which frequency is relevant can be distinguished. On the one hand, a candidate item for grammaticalization can have a high **proportional frequency** in combination with a given host lexeme, compared to combinations with other lexemes. Three examples of this are given in (i)-(iii).

 (i) Possessive affixes and inalienable nouns: In many languages, possessive pronouns have been grammaticalized as affixes only with inalienable nouns, i.e. nouns that very frequently occur in a possessive construction (cf. Nichols 1988). For instance, in the Old Tuscan

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[13] Thus, it is somewhat analogous to abstract principles in generative grammar, such as the A-over-A principle. If such principles seem to reflect correct generalizations and if it is plausible to assume that they are part of

variety of Italian, possessive pronouns, deriving from the Latin independent possessive pronouns (e.g. *mulier mea* 'my wife'), were grammaticalized as possessive suffixes with inalienable nouns (e.g. *moglia-ma* 'my wife', *fratel-to* 'our brother', *signor-so* 'his father', Rohlfs 1968: 124), but not with alienable nouns (e.g. **terra-ma* 'my land'). The claim here is not that possessed inalienable nouns are more frequent in absolute terms than possessed alienable nouns, but that with inalienable nouns, a higher proportion of occurrences are with a possessive pronoun. Thus, 'my kidney' is not more frequent than 'my village', but most occurrences of 'kidney' include a possessor, whereas a much smaller proportion of occurrences of 'village' include a possessor.

(ii) Reflexive affixes and self-directed verbs: In many languages, reflexive pronouns have been grammaticalized as affixes only with self-directed verbs such as grooming verbs, i.e. verbs that very frequently occur in a reflexive construction (cf. Kemmer 1993). For instance, in Old Norse, reflexive pronouns, deriving from Proto-Germanic independent reflexive pronouns (e.g. **klaiðjanþ sik* '(they) dress themselves'), were grammaticalized as reflexive suffixes with grooming verbs and other "self-directed" verbs (e.g. *klæða-sk* '(they) dress', *legja-sk* '(they) lie down, lit. lay themselves', Faarlund 1994: 57), but not with "other-directed" verbs such as 'help' (**hjálpa-sk* '(they) help themselves'). Again, the claim here is only that a higher proportion of occurrences of the self-directed verbs include a reflexive pronoun, thus making grammaticalization more likely with these verbs than with other-directed verbs.

(iii) Locative affixes and inanimate nouns: In many languages, case affixes are restricted to nouns of a particular semantic class. For instance, in Dhivehi (the Indo-Aryan language of the Maldives), the locative case is possible only with inanimate nouns, while animate nouns

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Universal Grammar, most linguists are willing to accept them as contributions to linguistic theory, even though it is quite unclear in what way they are innate.

must resort to a circumlocution (cf. 24). Again, this must be because animates are rarely thought of as locations and are hence rarely used with a locative case.

(24) Dhivehi (Cain & Gair 2000: 16)

inanimate noun		animate noun	
fot	'book'	*dari*	'child'
fotu-ge	'of the book'	*darī-ge*	'of the child'
fotu-gā	'in the book'	**darī-gā*	'in the child'
		(darī-ge gai-gā 'in the child('s body)')	

On the other hand, a candidate item for grammaticalization may have a high **absolute frequency** independently of the host lexeme, compared to other similar candidate items. In these cases, it is the less frequent candidate item, not a subclass of the host lexeme class, that fails to undergo grammaticalization because of lower frequency.

(i) Present-tense and past-tense auxiliary verbs. Since present-tense forms are more frequent than past-tense forms (Greenberg 1966: 48), we predict that they are more likely to cliticize and attach to a host. This is confirmed by cases such as the following:

(25)		present tense	past tense
	English	*I am > I'm*	*I was > *'s*
		I want to > I wanna	*I wanted to > *I wantedta*
	Bulgarian	*az=sâm* 'I'm'	*az bjax* 'I was'
	Classical Greek	*egō=eimi* 'I'm'	*egō ēn* 'I was'

(ii) Dual and trial number. Since the numeral 'two' is universally more frequent than the numeral 'three', it is more likely to be grammaticalized as a number marker. Thus, we predict that in some languages there will be a dual but no trial, whereas there is no language with a trial but no dual. The pronouns of Mangap-Mbula and Loniu, two Oceanic languages of New Guinea, exemplify this (see Bugenhagen 1995: 108, Hamel 1994: 52).

(26a) Mangap-Mbula

	singular	dual	trial	plural
1incl		*ituru*	--	*iti*
1excl	*nio*	*niamru*	--	*niam*
2	*nu*	*niomru*	--	*niom*
3	*ni*	*ziru*	--	*zi*

(26b) Loniu

	singular	dual	trial	plural
1incl		*tɔʔu*	*čito*	*tahah*
1excl	*yo*	*u*	*uto*	*uwɛh*
2	*wɔw*	*ɔw*	*ɛtow*	*hah*
3	*iy*	*suʔu*	*hetow*	*sɛh*

As the authors of the grammatical descriptions note, the dual and trial affixes in these
languages derive from numerals (Proto-Oceanic *rua* 'two', *tolu* 'three'). A few languages
have also grammaticalized the numeral four (see Corbett 2000: 26-30 on quadrals).

3.4. The explanation of the DPRC

My explanation of the DPRC is completely analogous to the explanation of the asymmetries
in §3.3: I claim that the bound-pronoun combinations blocked by the DPRC do not occur (in
the languages with DPRC effects) because they have not been grammaticalized due to their
less frequent occurrence, compared with the other combinations. This can again be
illustrated well by Romance languages, because their history is so well attested. It is well-
known that Romance clitic pronouns derive from the independent pronouns and
demonstratives of Latin (cf. Wanner 1987). Latin had virtually no word order restrictions at
the clause level, so these could occur in any order, and combinations such as *me illi* 'me to

him' were perfectly grammatical. However, as in German, these combinations must have been quite rare, for the same reasons (see §4 and §6 for more discussion). When Latin turned into Romance, the pronouns and demonstratives split up: Their stressed uses became the independent pronouns of the Romance languages, and their unstressed uses became the clitic pronouns.[14] These were grammaticalized in a quite rigid way, leading to a fixed position in the clitic sequence, a more or less fixed position with respect to the verb. The paradigm has gaps in those cases that were too rare to make it through the bottleneck of grammaticalization. So I am claiming that the rise of DPRC effects is inextricably linked to a grammaticalization process. If a language were found in which all bound-pronoun combinations were possible at an earlier stage and certain combinations became impossible at a later stage (without attendant further grammaticalization), this would constitute counterevidence to my theory.

Thus, this explanation of the DPRC is not a synchronic explanation, but a diachronic explanation. The synchronic cross-linguistic distribution of grammatical systems is constrained in the observed way because of a restriction on the way in which languages change. The unattested language type (languages showing anti-DPRC effects) does not exist because there is no way in which it could arise (given the Frequency Condition of Grammaticalization), not because of some synchronic reason (e.g. because it is unlearnable due to the structure of Universal Grammar).

4 The frequencies of pronoun combinations

The claim that combinations like 'it/him to me' are universally more frequent than combinations like 'me to it/him' is unsurprising and should not be controversial, so I will

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[14] Another unrelated language where a change from independent object pronoun to bound object pronoun is attested is Maltese. A form with Theme and Recipient suffixes such as ftaħtielu (ftaħ-t-hie-lu [open.PF-1SG.SUBJ-3SGF.THM-3SGM.REC]) 'I opened her to him' comes from a Classical Arabic source like fataħ-tu-haa la-hu [open.PF-1SG.SUBJ-3SGF.THM TO-3SGM].

not make great efforts to marshal evidence for it. For obvious semantic reasons, the Recipient of a ditransitive construction is virtually always animate, and the Theme shows a strong tendency to be inanimate (this was observed, for instance, by Jespersen 1927: 287). Inanimate Recipients occur only when a ditransitive verb has a very atypical meaning (e.g. English *give* in *I'll give it a try*, or French *préférer* in *Ce film, je lui préfère le roman* 'This movie, I prefer the novel to it'). Animate Themes do occur with ditransitive verbs such as 'prefer' and recommend', but of course verbs of transfer such as 'give' and 'sell' are much more frequent, and they allow animate themes only in special circumstances such as marriage and slavery.[15] Most ditransitive speech act verbs do not allow animate themes at all for semantic reasons.[16]

Since first and second person pronouns are always animate and third person pronouns may be inanimate, it is clear that the Theme NP will most often be third person, whereas the Recipient NP may be first, second or third person.[17]

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[15] Below I give some data from frequency dictionaries for four languages, to give an idea of the relative frequencies of different (potentially) ditransitive verbs. Note that for German, Italian and Spanish absolute frequency figures are given, whereas for Russian the rank is given (sometimes for two verbs: the perfective and the imperfective versions).

	German (Ruoff 1981)		Italian (De Mauro 1993)		Spanish (Justicia 1995)		Russian (Brown 1996)	
'give'	*geben*	1168	*dare*	1300	*dar*	1487	*da(va)t'*	140/155
'send'	*schicken*	41	*mandare*	248	*mandar*	141	*pos(y)lat'*	995/2023
'sell'	*verkaufen*	125	*vendere*	118	*vender*	108	*proda(va)t'*	1999/2291
'show'	*zeigen*	32	—		*enseñar*	186	*pokaz(yv)at'*	316/556
'prefer'	*vorziehen*	2	*preferire*	43	*preferir*	41	*predpočitat'*	4852
'recommend'	*empfehlen*	1	*raccomandare*	35	*recomendar*	3	*rekomendovat'*	3997
'entrust'	*anvertrauen*	1	*affidare*	18	*confiar*	7	*doverit'*	9144

[16] Here and below I do not distinguish between 'animate' and 'human' because it is unclear which of these notions is the more important notion cross-linguistically. So 'animate' should be read as a shorthand form for 'animate or human'.

[17] This is not a new observation. Retsö (1987:224), in a discussion of double pronominal objects in the Semitic languages, notes that "the receiver tends to be animate and may be either of three persons, while the patient tends to be inanimate and, as a rule, the 3rd person. It is in fact possible to extract a corpus of examples showing that this is the dominant combination."

Animacy thus explains the "harmonic association" of the person and role scales that was observed by the authors mentioned in §2.6. "Harmonic" is thus a simple synonym of "likely to occur" or "natural", and we have a straightforward semantic-pragmatic explanation of the harmonic association, both of the direction of the association and of the nature of the scales that are associated. Implicitly a somewhat similar explanation is given by Farkas & Kazazis (1980: 77-79). They note that the higher positions both on the role scale and on the person scale are associated with greater inherent topicality and "empathy potential", and they refer to both scales as "topicality hierarchies".[18] Thus, bound pronoun combinations with a first or second person Recipient are very useful and natural (because both first and second person and Recipient tend to be topical), whereas combinations with a first or second person Theme are rather unnatural and not so useful (because first or second person tend to be topical, whereas a Theme tends not to be topical). This sounds rather different from my explanation in terms of animacy. However, animacy is of course itself highly correlated with topicality, so that there is no real contradiction between an animacy-based explanation of the frequency asymmetry and a topicality-based explanation (see §6.2 for more evidence that topicality is an important factor for other aspects of the syntax of ditransitive constructions).

Thus, the frequency skewing that was presupposed in the usage-based explanation of §3 can be easily deduced from general considerations, but it is still useful to examine text corpora to see whether they confirm the predicted frequency asymmetry. Of course, we should not study the frequency of pronoun combinations in languages with DPRC effects such as French, because one could argue that the grammatical asymmetry influences the text frequency of pronoun combinations (i.e. *me la* 'her to me' could be more frequent than *me... à elle* 'me to her' simply because the former shows two bound pronouns, whereas the latter shows one bound pronoun and one free pronoun). So we need to look at languages like

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[18] This is even more explicit in Duranti's (1979) analysis, which is however based on the idea of positional requirements linked to topicality.

German, where there is no distinction between bound and free pronouns, and where all pronoun combinations are grammatical. And in fact the disfavored person-role-combinations are attested in German corpora: Example (27) is from one of Goethe's novels.

(27) einer von den Neffen meiner Wohltäterin stellte **mich ihm** als geschickten Forstmann vor, ... (Goethe, Wilhelm Meister)

'one of my benefactor's nephews introduced **me to him** as a skillful forest ranger'

In order to show conclusively that these person-role combinations are universally rare, one would need corpora from a wide range of diverse languages that are representative of everyday colloquial speech, and that are large enough to contain a sufficient number of ditransitive constructions with two object pronouns. In this paper I have to confine myself to an example from one language, and for the sake of convenience I settled on a written corpus that was readily available: the Goethe sub-corpus (1.4 million words) of the online COSMAS corpus of the Institut für deutsche Sprache (Mannheim).[19] The Goethe corpus has the advantage that there are many first person pronouns (Goethe's novels are typically written from the protagonist's perspective), though second person pronouns are of course underrepresented as in most other written texts.

The Goethe corpus contains 241 instances of ditransitive constructions with two object pronouns. Their distribution over the four main categories is shown in Table 2.

		dative pronouns	
		1st/2nd person	3rd person
accusative	1st/2nd person	15 (6%)	34 (14%)
pronouns	3rd person	132 (55%)	60 (25%)

Table 2: Object-pronoun combinations in the COSMAS Goethe corpus

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It can be seen that object-pronoun combinations with 1st/2nd-person accusative pronouns are rarer than expected (χ^2 = 23.87, p ≤ 0.001). The most favored combination is the combination of 3rd person Theme and 1st/2nd person Recipient pronouns, i.e. precisely the combination that is attested in all languages with two bound object pronouns (cf. 15). I see no reason to doubt that this reflects a universal tendency, but readers who doubt it can easily check for themselves and confirm (or falsify) the claim on a different corpus.

My explanation in terms of the Frequency Condition on Grammaticalization is primarily based on the asymmetric frequency distribution, and in this way it differs sharply from previous approaches. Linguists have traditionally sought to account for non-arbitrary patterns directly in terms of semantic-pragmatic notions, and we saw two such attempts in §2.5 (markedness of person and case values) and §2.6 (harmonic association of person and role scales). The latter turned out to be on the right track with respect to the basic generalization, but the precise causal relation between the "disharmony" of a combination and its ungrammaticality is unclear in Farkas & Kazazis (1980), Rosen (1990), and Parodi (1998).

By contrast, the relation between "disharmony" and ungrammaticality is much clearer in my usage-based explanation, where there is a reasonably well-understood causal chain from usefulness (or "naturalness" or "harmony") to frequency, and from frequency to grammaticalization. Thus, there is nothing mysterious about the notion of "harmony", and it has no particular theoretical status in my account; in particular, there is no implication that speakers' mental grammars record the harmonic or disharmonic status of pronoun combinations. It so happens that for semantic-pragmatic reasons, certain pronoun combinations tend to be more frequent than others, and we can describe these reasons in terms of a concept of "harmonic association of scales". But the nature of the grammar is influenced by the conditions on the diachronic process of grammaticalization, in particular, frequency.

5 Interim summary

Let me summarize my usage-based explanation so far: I have proposed that the DPRC should be explained with reference to frequency in language use and grammaticalization: Because the person and role scales correlate strongly with topicality and animacy, "high persons" tend to occur in "high roles" and "low persons" tend to occur in "low roles", i.e. harmonic person-role associations are more frequent than disharmonic person-role associations. This frequency skewing can be directly observed in languages that have no bound/free distinction in their pronouns, e.g. German. When free pronouns undergo grammaticalization, as happened fairly recently in the Romance languages and in Maltese, only the most frequent combinations survive as grammatical patterns, due to the Frequency Condition on Grammaticalization. Since grammaticalization depends on many other (largely unknown) factors, it is impossible to predict whether a given language will allow all bound-pronoun combinations (as Kabardian does) or whether only a proper subset will be possible after the grammaticalization change is completed (as in French and other languages with DPRC effects).

I will now briefly compare this explanation to those in §2 and point out in which ways it is superior to them:

(i) Cross-linguistic generality. My usage-based explanation predicts that the DPRC should be universal as a preference, because the ultimate semantic-pragmatic reason for the frequency skewing applies to all languages. It is thus more general than language-particular stipulation (§2.1) and other explanations that apply only to certain languages (such as the ban on doubly filled structural slots (§2.2)). This does not mean that the usage-based explanation makes language-particular stipulation superfluous. Clearly, speakers learn the language-particular DPRC effects and grammars must contain statements about the restriction, but linguists' curiosity need not stop there.

(ii) Preference, not absolute constraint. Since there is no absolute minimum frequency that is required for grammaticalization, it is not expected that all languages will show DPRC effects, in contrast with explanations that see the DPRC as an inviolable constraint (§2.3). But there is a type of language that is excluded by the usage-based explanation: Languages in which only the rarer pronoun combinations are grammaticalized (i.e. languages with an "anti-DPRC effect") should not exist, or be very rare. Thus, even though the DPRC is not an absolute constraint, it does embody a falsifiable claim.

(iii) Irrelevance of pronoun position. The usage-based explanation makes no reference to the order of the bound pronouns, unlike the explanation in terms of positional alignment (§2.4). This is appropriate, because there is no evidence that the relative order of the pronouns, either with respect to each other or with respect to the verb, is a relevant factor.

(iv) Harmonic association of scales. Person-role associations are more "natural" or more "harmonic" when high persons (first/second) are associated with high roles (Agent, recipient), and when low persons (third) are associated with low roles (Theme, Patient), because both the person and role scales are strongly correlated with animacy and topicality. This explanation for scale alignment and its direction is difficult to build into a formal model. Moreover, the fact that unnatural or disharmonic combinations are infrequent in language use follows straightforwardly from the general properties of speakers' pragmatic behavior in language use.

(v) Restriction to bound pronouns. Since the Frequency Condition on Grammaticalization is relevant only to grammaticalized structures, the DPRC will apply only to bound (i.e. strongly grammaticalized) pronoun combinations, so this restriction follows immediately from the usage-based explanation.[20] It does not seem to follow from any of the other explanations.

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[20] A slightly revised version of this statement will be given at the end of §6.1.

There is a further potential competing explanation that I have not discussed so far: an account in terms of functional Optimality Theory and Harmonic Alignment. This will be discussed in §6.6.

6 Some extensions of the usage-based explanation

6.1. How important is frequency?

One possible objection to the frequency-based explanation presented in §3-5 is that the frequencies of grammatical patterns may vary along countless dimensions: subordinate vs. main clause, past tense vs. present tense, singular vs. plural, specific lexical items, speaker's age and sex, spoken vs. written language, and so on. Why do we get a grammaticalization effect only with person and role categories, and not dependencies between various other factors? Many linguists seem to find the data from language use rather chaotic and confusing, whereas grammatical structures seem highly systematic and orderly to them. They are likely to ask: Is it really plausible that frequency of use should play such an important role in determining grammatical structures? (cf. Newmeyer 1998a: §5.3.2)

My answer to this potential objection is twofold: On the one hand, I expect that once linguists look in the right direction, they will find evidence for many of the structural asymmetries that the frequency-based account predicts to be possible. What we observe in languages is to a large extent determined by what we look for. On the other hand, I readily admit that frequency is not the only important factor determining grammatical structures, although I would insist that its importance is widely underestimated.

Besides frequency, it is clear that **analogy** plays a very important role in shaping grammatical structure. It is because of this factor that semantically similar verbs often show the same type of argument coding. For instance, the French verb *présenter* 'introduce, present' behaves just like the semantically related *montrer* 'show' and *donner* 'give', although it occurs much more often with an animate Theme argument. If frequency were the

only relevant factor, one might expect *présenter* to lack DPRC effects. But just as sound change typically affects whole classes of words (because of analogy), grammaticalization too tends to affect whole classes of lexical items. Another example is the behavior of third person pronouns. One might expect these to behave differently, depending on whether they are animate or inanimate. A pronoun combination like 'it to me' is certainly much more frequent than a combination like 'him to me', and yet in French, *Agnès me le montre* [Agnès 1SG.REC 3SG.THM shows] can mean either 'Agnès shows it to me' or 'Agnès shows him to me'. So the grammaticalization has affected the whole class of third person pronouns, independently of their meaning, and animate third persons follow the pattern of the (more frequent) inanimate third person pronouns. So analogy is a very important factor, but it must be emphasized that analogical effects need not be present and cannot be predicted for specific cases. It so happened that French *présenter* joined the class of 'give' and 'show', but this was not necessary (cf. English, where *present* does not allow the double-object construction of *give* and *show*). And it so happened that French *le* 'him' behaves like *le* 'it', but this is by no means necessarily so. Notice, for instance, that the third person reflexive pronoun *se* did not follow the analogy of *le*: The combination **se lui* is just as impossible as **me lui* and **te lui*, although *se* is third person; but because of its coreference with the subject, *se* is far more likely to be animate than *le*.[21]

Thus, I expect that we will find many other conventionalized restrictions on the patterning of Recipient and Theme arguments besides the restriction on first/second person Themes in bound pronoun combinations that have been the main focus of this paper. One factor that immediately comes to mind is number. Plural forms are invariably rarer than singular forms, so one might expect some languages to show greater restrictions on plural

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[21] It would be good if we could formulate restrictions on analogy: Which analogical effects are possible or likely, and which analogical effects are impossible or unlikely? I have nothing to contribute to these questions in the present context, but what matters here is that analogy always extends existing patterns, so that it can only eliminate, but never create DPRC effects.

object pronouns. This is indeed the case in Romanian, where combinations of plural bound object pronouns are inherently worse than combinations of singular bound object pronouns (Farkas & Kazazis 1980: 79-81):[22]

(28a)	O	să	mi	te	omoare.
	will	that	1SG.REC	2SG.THM	kill.3PL

'They will kill you (SG) on me.'

(28b)	*Vor	să	mi	vă	omoare.
	want.3PL	that	1SG.REC	2PL.THM	kill.3PL

'They want to kill you (PL) on me.'

Moreover, one might ask why the DPRC should be confined to grammaticalized pronouns, because full NPs and free pronouns must show frequency asymmetries as well, and they could equally become subject to grammaticalized constraints. This is correct, and when I said in §5 that only bound pronouns show grammaticalization effects, this was an oversimplification. All conventionalized linguistic structures, whether phrasal patterns, clitic groups or morphologically complex words are in a sense grammaticalized, i.e. they are part of speakers' internal grammatical knowledge. And we do indeed find languages with restrictions on the combination of independent Recipient and Theme pronouns. In many varieties of English, while (29a) is perfectly normal, (29b-d) get progressively worse, although these object pronouns are not normally regarded as "bound pronouns".[23]

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[22]A somewhat different type of number contrast is reported for Shambala by Duranti (1979:36-37).

[23] There is considerable variation among English speakers with regard to these structures. Some (especially American English speakers) find all four examples in (29) bad, while others (especially speakers of British English) find all of them grammatical. The matter is complicated further by the fact that in different dialects of British English, different orderings of Recipient and Theme are preferred (They showed her it vs. They showed it her). Surprisingly, nobody seems to have studied English object pronoun combinations in any detail.

(29a)   They showed me it.

(29b)   ?They showed her it.

(29c)   ??They showed her him.

(29d)   *They showed her me.

Thus, instead of saying that DPRC effects are impossible with independent pronouns, we should say that they are more likely with bound pronouns, because these are more strongly grammaticalized than full NPs and free pronouns. So what is effectively ruled out is a language that has both free and bound pronouns, but only free object pronouns obey the DPRC.

6.2. More harmonic association with Recipient and Theme

In addition to animacy, person and role, there are other properties of arguments that have to do with topicality, or more precisely topicworthiness, i.e. the tendency for NP types to occur as topics. We saw in §4 that authors such as Duranti (1979) and Farkas & Kazazis (1980) attributed the harmonic association of Recipient with first/second person and of Theme with third person to topicality or topicworthiness: Recipients are very topicworthy, and so are first and second person pronouns, and consequently these are often associated with each other. But topicality also correlates with animacy (as we saw in §4), and indeed with other parts of the animacy scale such as pronoun vs. full NP, proper noun vs. common noun, and of course with definiteness:

(30) Expected harmonic associations

more topicworthy	**less topicworthy**
Recipient	Theme
first/second person	third person
pronoun	full NP
proper name	common noun
animate	inanimate
definite	indefinite

In all these cases, there must be frequency asymmetries, and we can predict that some languages will conventionalize the discourse preferences for harmonic associations. In the following, I will give examples of grammatical restrictions for each of these additional harmonic associations.

(i) Pronoun vs. full NP. Lillooet (Interior Salish, British Columbia) has a grammatical restriction to the effect that when the Recipient is a full NP, the Theme must be a full NP as well (van Eijk 1997: 229). Thus, (31a) is possible, but (31b) is impossible (the latter example was constructed on the basis of van Eijk's statements). Instead, a passive construction must be used.

(31a)　　ʔúm'n-as-Ø　　　　　kʷ‿s-Sam　　　ti‿c'qáx̌ʔ‿a

　　　　　give-3SG.SUBJ-3SG.OBJ　ART-NMLZ-Sam　ART-horse-ART

　　　　　'He gave Sam a horse.'

(31b)　　*ʔúm'n-as-Ø　　　　　kʷ‿s-Sam

　　　　　give-3SG.SUBJ-3SG.OBJ　ART-NMLZ-Sam

　　　　　'He gave it to Sam.'

(31c)   táwən-ɬkan-Ø   ʔayɬ   ni‿n-c'qáx̌ʔ‿a

                  sell-1SG.SUBJ-3SG.OBJ   then   ART-1SG-horse-ART

                  'Then I sold him my horse.'

The opposite situation, with the Theme as a full NP and the Recipient as a pronoun, is perfectly normal (cf. 31c). A similar restriction is reported for Lunda (Bantu-K, Zambia and Angola) by Kawasha (2002: 38-40).[24]

(ii) Proper name vs. common noun. Kikongo (Bantu-H, DR Congo) allows two animate NPs as Recipient and Theme in its double-object construction (cf. 32a), but Recipient and Theme cannot be both proper names (cf. 32b). A different construction involving the preposition *kwe* 'to' has to be used (cf. 32c) (Lumwamu 1973: 181).

(32a)   Ga:na   Ngu:nú   mwá:na.

                  give   Ngunu   child

                  'Give Ngunu the child!'

(32b)   *Ga:na   Masambá   Ngu:nu.

                  Give   Masamba   Ngunu

                  'Give Masamba Ngunu!'

(32c)   Ga:na   Ngu:nu   kwe   Masamba.

                  give   Ngunu   to   Masamba

                  'Give Ngunu to Masamba!'

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[24] On the basis of (30), we would also expect the existence of languages in which the Recipient must be a pronoun and cannot be a full NP, i.e. 'He gave him a horse' would be expressed by the standard construction, but 'He gave Sam a horse' would require a circumlocution. Such languages are not uncommon, a case in point being French, where a simple prepositionless construction is possible only when the Recipient is a pronoun (Il lui a donné un cheval 'He gave him a horse', but not *Il a donné Sam un cheval 'He gave Sam a horse'). For full-NP Recipients, French has to use a circumlocution with the preposition à (Il a donné un cheval à Sam 'He gave Sam a horse'). This construction is not normally thought of as a "circumlocution", but it meets the definition of this term that I have been working with in this paper ('an alternative construction with roughly the same meaning that is more complex grammatically and/or lexically').

(iii) **Animate vs. inanimate.** In many (especially European) varieties of Spanish, there is a distinction between the inanimate third person masculine Theme object clitic *lo* ('it') and the animate third person masculine clitic *le* ('him'), e.g. *lo vi* 'I saw it' vs. *le vi* 'I saw him'. In these so-called "leísta" dialects, the animate Theme clitic *le* cannot cooccur with a Recipient clitic, whereas the inanimate clitic can (Ormazabal & Romero 1998: 418):

(33a)   *Te   le   di.

       2SG.REC   3SG.M.ANIM.THM   I.gave

       'I gave him to you.'

(33b)   Te   lo   di.

       2SG.REC   3SG.M.INANIM.THM   I.gave

       'I gave it to you.'

In Mohawk (Iroquoian, New York State, Ontario, Quebec), a ditransitive Theme can only be inanimate (cf. 34a), not animate (cf. 34b-c) (Baker 1996: 194; the similarity to the Spanish facts was pointed out by Ormazabal & Romero 1998: 423-4).

(34a)   Ká'sere'   ʌ-hi-tshʌ́rya-'s-e'.

       car   FUT-1SG.AG/3SGM.OBJ-find-BEN.APPL-PUNC

       'I will find him a car.'

(34b)   *Káskare'   ʌ-hi-tshʌ́rya-'s-e'

       girlfriend   FUT-1SG.AG/3SGM.OBJ-find-BEN. APPL -PUNC

       'I will find him a girlfriend.'

(34c)   *Wa-hi-ya't-óhare-'s-e'.

       FACT-1SG.AG/3SGM.OBJ-body-work-BEN. APPL -PUNC

       'I washed him for it (e.g., a special school event).'

Conversely, in Passamaquoddy-Maliseet, the Recipient NP cannot be inanimate, so there is no direct translation of a sentence like *I gave money to the church* (Leavitt 1996: 36). The

same is true in Southern Tiwa (Allen & Frantz 1986: 391) and Kinyarwanda (Kimenyi 1980: 59).[25]

(iv) Definite vs. indefinite. In Akan (Niger-Congo, Kwa; Ghana etc.), the Theme argument in a double-object construction must be indefinite, as in (35a). (35b) with the definite article on the Theme is ungrammatical, and a circumlocution must be used instead (cf. 35c), in which the Theme is introduced by the serial verb *dè* (lit. 'take') (Sáàh & Ézè 1997: 143-44).

(35a)	Ámá	màà	mè	sìká.		
	Ama	give	1SG	money		

'Ama gave me money.'

(35b)	*Ámá	màà	mè	sìká	nó.	
	Ama	give	1SG	money	the	

'Ama gave me the money.'

(35c)	Ámá	dè	sìká	nó	màà	mè.
	Ama	take	money	the	give	1SG

'Ama gave me the money.' (Lit. 'Ama took the money gave me.')

Since personal pronouns are always definite, Akan also shows the pronoun/full NP contrast that we saw above for Lillooet (Sáàh & Ézè 1997: 143).

Conversely, in Kinyarwanda (Bantu-J, Rwanda etc.), the Recipient NP must be definite. In order to render a sentence with an indefinite Recipient (e.g. 'I gave a child a book'), the language has to resort to a circumlocution with an existential construction ('There is a child I gave a book') (Kimenyi 1980: 59-60).

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[25] For Classical Nahuatl, Launey (1994:168) describes an animacy restriction just for the indefinite pronominal prefixes tla- 'someone' and tē- 'somebody': ni-tē-tla-maca [1SG.SUBJ-INDEF.HUM.OBJ-INDEF.INANIM.OBJ-give] can only mean 'I give something to somebody', not 'I give somebody to something'.

Thus, for all of the expected harmonic associations of (30) we find cases of grammatical restrictions reported in the literature. Such restrictions are of course expected to be rarer with full NPs than with bound pronouns, but even with full NPs they may be more common than has been suspected so far, because grammars are less likely to record such restrictions than inflectional gaps. The explanation for all these restrictions is the same as the explanation for the DPRC: Rare Recipient-Theme combinations fail to get grammaticalized.
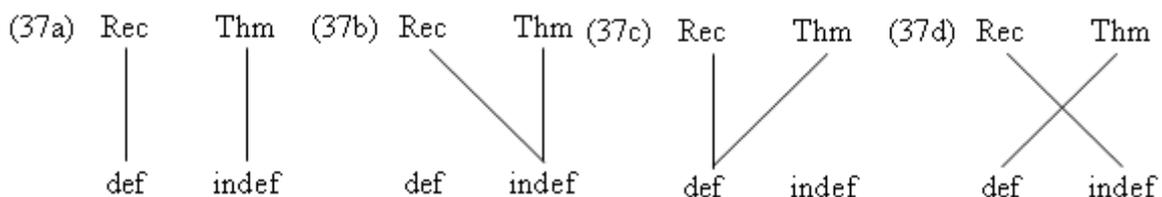
6.3. Generalizing the DPRC: The Ditransitive Topicality-Role Constraint

From the additional data that we saw in the preceding subsection, it is clear that the DPRC is only a special case of a larger generalization, which can be formulated as in (36).

(36) **Ditransitive Topicality-Role Constraint**

Grammars are likely to put restrictions on Recipient-Theme combinations to the extent

that the Recipient argument is not inherently more topicworthy than the Theme argument.

In (36), the wording "to the extent that" (instead of "if") is crucial in order to express the prediction that restrictions are the most likely if the Recipient is less topicworthy than the Theme, next most likely if the Recipient and the Theme are equally topicworthy, and least likely if the Recipient is more topicworthy than the Theme. Consider, for instance, the possible associations of role and definiteness in ditransitive constructions, shown in (37).

```
(37a) Rec    Thm  (37b) Rec    Thm (37c) Rec    Thm  (37d) Rec    Thm
       |      |          \     |          |    /          \    /
       |      |           \    |          |   /            \  /
       |      |            \   |          |  /              \/
       |      |             \  |          | /               /\
      def   indef         def indef      def indef        def  indef
```

(37a) is the most harmonic association, and it should be allowed by all languages according to the Ditransitive Topicality-Role Constraint. (37d) is the most disharmonic association, so this is the most likely to be prohibited by a grammatical rule. The associations in (37b) and (37c) are intermediate between these two.

This means that for each of the associations mentioned in §6.2 as well as for person-role associations, there is a weak form, two strong forms, and one super-strong form of the restriction. A language that only bans (37d) thus shows the weak form of the Ditransitive Topicality-Role Constraint for definiteness. A language banning both (37d) and (37b) shows one strong form of the constraint (a case in point is Kinyarwanda, which allows (37c): 'I gave the book to the child'). A language banning both (37d) and (37c) shows a different strong form of the constraint (possibly Akan is such a language, if it allows 'Ama gave a child money'; I do not know whether this is the case). Finally, a language that allows only (37a) would show the super-strong form of the restriction. No language should allow (37d) but prohibit (37b), for instance. In other words, (37) could also be conceived of as an implicational hierarchy (37d ⊃ 37c/37b ⊃ 37a), so that implicational universals like (15) are just special cases of implicational hierarchies.

6.4. Weak, strong, and superstrong DPRC

Let us now return to the DPRC. As with the Ditransitive Topicality-Role Constraint for definiteness, four different situations need to be distinguished:
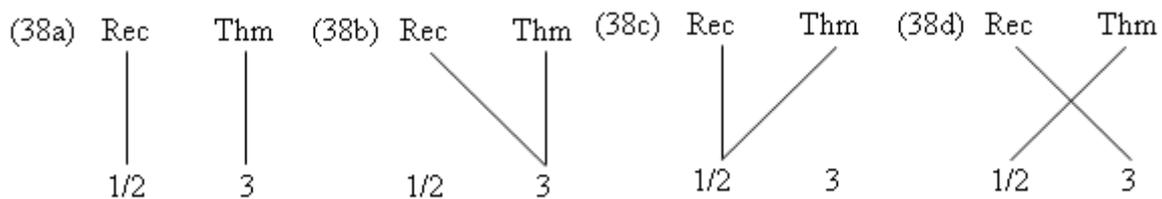
By definition, all languages with DPRC effects prohibit (38d), and many of them in addition prohibit (38c). Many of the languages mentioned in §1 do indeed show this stronger form of the DPRC, which can be formulated as in (39).

(39) **The Ditransitive Person-Role Constraint, a strong form**

Combinations of bound pronouns with the roles Recipient and Theme are disfavored if the Theme pronoun is first or second person.

For example, in French, not only is (2b) ungrammatical, but also the corresponding sentences with a first or second person Recipient (*Agnès me te présentera* 'Agnès will introduce me to you.'), and in Modern Greek, not only is (3b) ungrammatical, but also the corresponding sentences with a first or second person Recipient (*Tha mu se stílune* 'They will send you to me'). Further languages showing this strong form of the DPRC are Basque, Maltese, and Southern Tiwa.

But in other languages, only the weak restriction is found, i.e. only (38d) is ruled out, and (38c) is possible.[26] In (40) I give two examples from such languages showing combinations of first/second-person Recipients and Themes are given (another example, from Romanian, was seen earlier in (28)).

(40a) Catalan (Bonet 1994: 41)

Te	m'	ha	venut	el	mercador	mès	important.
You	me	has	sold	the	merchant	more	important

'The most important merchant has sold you to me.' (or: '... me to you')

(40b) Italian (Davide Ricca, p.c.)

Mi	hanno	chiamato	e	mi	ti	hanno	presentato.
me	have	called	and	me	you	have	introduced

'They called me and introduced me to you.'

In addition to the weak form and one type of strong form, the super-strong form of the Ditransitive Topicality-Role Constraint for person is attested as well: In Kambera (Central Malayo-Polynesian, eastern Indonesia), "two object clitics can occur in sequence if the inner

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[26] That there is both a "weak" and a "strong" form of the "Person-Case Constraint" was noticed by Bonet (1994:40-41), who also pointed out that the weak form seems to be confined to languages with clitic pronouns, whereas languages with object affixes always show the strong form of the DPRC. Bonet has no explanation for this, but in the present context it would not be surprising if this correlation turned out to be correct: Object affixes are more grammaticalized than object clitics, so they should on the whole be subject to stronger restrictions.

clitic [i.e. the Recipient] is first or second person and the outer clitic is third person"
(Klamer 1997: 903):

(41) Kambera (Klamer 1997: 903-904)

(41a)   Na-wua-ngga-nya.

               3SG.AG-give-1SG.REC-3SG.THM

               'He gives it to me.'

(41b)   Na-wua-nggau-nja.

               3SG.AG-give-2SG.REC-3PL.THM

               'He gives them to you (e.g. apples).'

(41c)   *Na-wua-nja-nya.

               3SG.AG-give-3PL.REC-3SG.THM

               'He gives it to them.'

(41d)   *Na-wua-ngga-nggau.

               3SG.AG-give-1SG.REC-2SG.THM

               'He gives you to me.'

Thus, Kambera only allows (38a). I have no example of a language that only shows the other type of strong constraint, where (38c) is possible but (38b) is not, and given my explanation, this must be an accidental gap.

6.5. The Monotransitive Person-Role Constraint

Topicality-role interactions are not limited to ditransitive constructions. The harmonic associations of (30) are valid not only for Recipient and Theme, but also for Agent and Patient of a monotransitive construction. Thus, there is also a "Monotransitive Person-Role Constraint", which expresses a preference for Agents to be first/second person and Patients to be third person. Impressionistically, effects of this constraint are less widely found than DPRC effects, but an example comes from the Coast Salish language Lummi (see Jelinek &

Demers 1983), where first/second person pronouns have to be agents in the active construction (cf. 42a). If they are patients, the basic active construction cannot be used (cf. 42b), and a circumlocution with the passive voice has to be used (cf. 42c):

(42) Lummi (Jelinek & Demers 1983: 168)

(42a)	(1>3)	x̣či-t-sən	cə	swəyʔqəʔ		
		know-TR-	the	man		
		1SG.SUBJ				
		'I know the man.'				

(42b)	(3>1)	*x̣či-t-oŋəs-s	cə	swəyʔqəʔ		
		know-TR-	the	man		
		1SG.OBJ-3SG.SUBJ				
		'The man knows me.'				

(42c)		x̣či-t-ŋ-sən	ə		cə	swəyʔqəʔ
		know-TR-PASS-	by		the	man
		1SG.SUBJ				
		'I am known by the man.'				

The explanation for the Monotransitive Person-Role Constraint would be completely analogous to my explanation of the DPRC: Since constructions like (42b) are significantly rarer than constructions like (42a), they may not become grammaticalized, and a roundabout way of expressing the same content must be used.

6.6. An analysis in terms of functional Optimality Theory and Harmonic Alignment

Aissen (1999) offers a detailed OT-based analysis of cases like Lummi cited in the preceding subsection. She adopts Prince & Smolensky's (1993: 136) notion of **Harmonic Alignment**, which can be seen as a formalization of the notion of harmonic association that was used so far in this paper. In her formal analysis, the upper part of the animacy scale (1,2

> 3) is aligned with the grammatical relation scale (a close relative of the semantic role scale: Subject > Object). This yields the harmony scales in (24), with two corresponding "constraint sub-hierarchies" (Aissen 1999: 681-2, slightly modified). (The connective 'ⵀ ' is to be read as 'more harmonic than', and ' > >' between two constraints means 'ranked above'.)

(43) **Harmony scales**   **Constraint sub-hierarchies**

Subj/1,2 ⵀ Subj/3   *Subj/3   > > *Subj/1,2

Obj/3 ⵀ Obj/1,2   *Obj/1,2   > > *Obj/3

The grammatical constraints are derived from the harmony scales by prefixing the star ('avoid') and inverting the rankings. The result is a set of constraints whose most important property is their fixed, universal ranking: *Subj/3 is ranked over *Subj/1,2, and *Obj/1,2 is ranked over *Obj/3, in all languages. A set of such universally ranked constraints is called a "sub-hierarchy". In addition, constraints derived from aligning the grammatical relation scale with the semantic role scale are used in Aissen's analysis, especially *Subj/Pat, which penalizes passive constructions, where the subject is a patient.

Thus, in Lummi sentence (42b) is ungrammatical because *Obj/1,2 is ranked higher than *Subj/Pat, so that the passive construction is the optimal candidate:

(44)

Input: V (Agent/3, Patient/1)	*Obj/1,2	*Subj/Pat
ACTIVE Agent/Subj/3 – Patient/Obj/1	*!	
☞ PASSIVE Patient /Subj/1 – Agent/Obl/3		*

It is not difficult to construct an analogous analysis of DPRC effects, using the animacy scale (1,2 > 3) and the relevant grammatical relation scale (Primary Object > Secondary Object), under the assumption that the Recipient pronoun is the primary object and the Theme pronoun is the secondary object. The harmony scales and the universal constraint sub-hierarchies are shown in (45), which is directly modeled on (43).

(45)   **Harmony scales**   **Constraint hierarchies**

PrimObj/1,2 ⊃ PrimObj/3   *PrimObj/3 >> *PrimObj/1,2

SecObj/3 ⊃ SecObj/1,2   *SecObj/1,2 >> *SecObj/3

We need a further constraint that penalizes free pronouns, other things being equal (this may be called AVOID PRONOUN STRENGTH, following Bonet 1994: 44). Now the ungrammaticality of the French sentence (2b) can be accounted for by the constraint ranking *SecObj/1,2 >> AVOID PRONOUN STRENGTH, as is illustrated in Tableau (46).

(46)	Input: V (Recipient/3, Theme/1)	*SecObj/1,2	AVOID PRONOUN STRENGTH
	me lui présentera	*!	
☞	*me présentera à elle*		*

A formal analysis of this type scores well on several counts, and I consider it the most serious competitor of my usage-based explanation. It incorporates the insight, which I believe is fundamentally correct, that DPRC-violating *sentences are bad because they show a lack of harmony between two scales that "need" to be in harmony.* It accounts for the fact that the DPRC is not universal: If AVOID PRONOUN STRENGTH is ranked higher than *SecObj/1,2, then a language of the Kabardian type emerges. And it expresses the fact that the DPRC is a universal preference: Languages showing the opposite preference are impossible, because *SecObj/3 is universally ranked below *SecObj/1,2.

However, the way Aissen's (1999) analysis is stated, it does not contain a motivation for the choice of scales that are aligned harmonically. Why isn't the role scale aligned harmonically with the number scale (singular > plural > dual > trial) or the agreement hierarchy (adjective > relative pronoun > anaphoric pronoun; Corbett 1979), for instance? Unless it can be shown that there is some intrinsic connection between the two scales, the explanation is not complete. Moreover, like the proposals of §2.6, Aissen (1999) does not really address the question of the direction of the alignment: Why is Subject/Primary Object associated with first and second person, and Object/Secondary Object with third person? Why not the other way round? She merely appeals to a notion of "prominence", which remains undefined.

In unpublished form, Judith Aissen has answered these questions as follows.[27] First, the choice of scales is constrained by the formal requirement that one of the scales must be binary, and in addition, the binary scale must be structural, because constraints derived by harmonic alignment concern the structural realization of substantive elements in outputs. This is why (unlike in the harmonic-association accounts of §2.7) it is not possible to align the role scale and the person scale directly, and the grammatical relation scale "Primary Object > Secondary Object", whose members are difficult to motivate for many languages, has to be brought into the picture.

Second, Aissen clarifies the notion of "prominence" that determines the direction of the alignment and thereby insures that 1st/2nd person subjects and 3rd person objects are the preferred associations: It is a cognitive property associated with the discourse referents that are introduced by nominal expressions, and it relates to high accessibility in discourse. Thus, the constraints derived by the harmonic alignment mechanism would be functionally grounded in the cognitive system.

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[27] Class lectures, DGfS/LSA Summer School, Universität Düsseldorf, July 2002. [http://www.phil-fak.uni-duesseldorf.de/summerschool2002/CDV/CDAissen.htm]

If these further clarifications are taken into account, Aissen's (1999) explanation of person-role interactions becomes very similar to the explanation proposed here. In contrast to most of the earlier formal analyses reviewed in §2, Aissen does not claim that the formal framework that she works with does any explanatory work (i.e. restricts the range of cross-linguistic variation). It merely provides the vocabulary and the procedures for description and explanation, and all the actual explanation comes from the constraints, which are themselves "functionally grounded". This is the fundamental similarity to my explanation: The idea of a rich set of arbitrary formal principles (the innate Universal Grammar) plays no role, and the observed cross-linguistic preferences are ultimately derived from functional factors external to the grammatical system.[28]

The main difference between Aissen's "functional Optimality Theory" approach and my usage-based approach is that Aissen, in line with a long generative tradition, does not separate explanation from description: Her descriptions incorporate functionally grounded constraints that allow the linguist to see immediately why the grammatical system of a language makes sense. The implicit claim is that the grammatical system also "makes sense" to the speakers, i.e. that the speakers' tacit knowledge of their language somehow incorporates the functionally grounded constraints. By contrast, my explanation is completely separate from the description: There is no claim that speakers' internalized grammars "make sense" and that the functional motivation is in any way reflected in the way the mental representation is organized. Functional factors influence performance and lead to different frequencies of different constructions, which then in turn influence the diachronic process of grammaticalization. The two approaches can be labeled **direct**

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[28] The similarities become even greater in Bresnan et al.'s (2001) approach in terms of "stochastic Optimality Theory", which differs from conventional Optimality Theory in that it also has something to say about frequency distributions in language use. Most interestingly, stochastic Optimality Theory can account for usage-grammar correspondences, which (as I noted in §3.1) are often the starting point for functionalist explanations. In Bresnan & Nikitina (2003), this approach was extended to ditransitive constructions.

functionalism and **diachronic functionalism** (broadly following Kirchner's (2001) terminology), and very similar issues are currently being debated in phonology (see Hale & Reiss 2000, Kirchner 2001). A thorough discussion of the respective merits of these approaches is beyond the scope of this paper (see also Newmeyer 2002a, 2002b, Bresnan & Aissen 2002, Haspelmath 2004, Aissen & Bresnan 2004 for further contributions to the debate). I hope that this paper contributes to the debate by providing a fairly detailed and explicit diachronic-functionalist explanation of a phenomenon that has long intrigued linguists but has so far resisted a convincing explanation.

7 Conclusion

I hope to have shown in this paper that the Ditransitive Person-Role Constraint, whose effects are seen in language after language with bound object pronouns, is best explained with reference to systematic and universal properties of language use (i.e. performance) (see the summary of arguments in favor of this in §5). In ditransitive constructions, the Theme argument is very likely to be third person and the Recipient is very likely to be first or second person, or in other words, the role scale (R > T) and the person scale (1,2 > 3) are harmonically associated. The frequency skewing in the source construction is the reason why DPRC-violating structures often do not get grammaticalized when free pronouns turn into bound pronouns. This is thus a usage-based and ultimately diachronic explanation of a widespread grammatical pattern.

I have argued that this grammar-external explanation is superior in empirical coverage to a number of competing grammar-internal explanations that make reference to structured slots (§2.2), innate constraints (§2.3), positional requirements (§2.4) or markedness of person and case values (§2.5). The correct generalization, that the disfavored combinations are those that show disharmonic associations, has been arrived at sporadically by earlier authors (§2.6), but I have argued that the crucial missing link between the notion of (dis-

)harmonic association and the observed (un-)grammaticality of combinations is the frequency of use in performance. In this approach, "harmonic association" simply means that the harmonic combinations are frequent and the disharmonic combinations are rare (for semantic-pragmatic reasons), i.e. there is no claim that harmonic association is in any way mentally represented in the speakers' competence (in this way, my approach differs from the functional OT account of Aissen 1999).

Finally, I have shown that the harmonic association of role and person scales can be subsumed under a larger generalization: in general, Recipient and Theme are harmonically associated with properties that are known to correlate with greater and lesser topicworthiness (pronoun-full NP, proper name-common noun, animate-inanimate, definite-indefinite). All of these can be grammaticalized by languages, as shown by the examples in §6.2. Thus, it turns out that the Ditransitive Person-Role Constraint is a special case of a larger generalization, the Ditransitive Topicality-Role Constraint.

Several reviewers have criticized the absence of a proposal for a formal description of DPRC effects in this paper. But providing formal descriptions was not among my theoretical goals to begin with. The point of this paper is that there exists a usage-based explanation for the cross-linguistic generalization embodied in the DPRC, and that this explanation is independent of the nature of the speakers' mental grammars. As I noted in §1, in traditional generative grammar the goals of explaining cross-linguistic generalizations and of characterizing speakers' mental grammars are typically conflated: Language-particular analyses are formulated in a restricted UG-based framework, so that proposals for language-particular description are automatically claims about Universal Grammar and hence about cross-linguistic generalizations. In my functionalist approach, these two goals are considered separately, and it is not presupposed that they will necessarily shed light on each other. Functional considerations of the kind appealed to here have a universal impact on language use and language change, and they constrain the cross-linguistic distribution of types of

grammatical structures. It is not clear that speakers' mental grammars are in any way constrained by them, because speakers know nothing about cross-linguistic distribution and language change. Speakers have the grammars they do because they successfully acquired the language of their environment, and it seems that the process of acquisition puts much fewer constraints on language structures than functional and diachronic factors do (cf. Newmeyer 1998b, Hale & Reiss 2000). A large class of imaginable grammars are easily acquirable, but unlikely to arise in language change and unlikely to be viable because they go against all functional preferences. Identifying this class is the larger goal of the functionalist enterprise that this paper hopes to contribute to.

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Abbreviations

ABS	absolutive
ACC	accusative
AG	Agent
APPL	applicative
ART	article
ASSRT	assertive
BEN	benefactive
DAT	dative
DPRC	Ditransitive Person-Role Constraint
ERG	ergative
FACT	factual
FUT	future
GEN	genitive
M	masculine
NMLZ	nominalization
OBJ	object
OBL	oblique case
PASS	passive
PF	perfective
PL	plural

PRES	present tense
PUNC	punctual
REC, Rec	Recipient
SG	singular
SUBJECT	subject
THM, Thm	Theme
TR	transitive