

# The Pragmatics of Differential Marking in Western Armenian

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## Abstract

Languages across language families exhibit the phenomenon of differential subject and object marking, which reflects to various degrees the semantic prominence of subjects *versus* objects. Recently, it has been interpreted in the optimality-theoretic framework by J. Aissen. In this report, we show that her framework cannot accommodate data from languages that use differential marking pragmatically and argue for an alternative analysis in terms of bi-directional optimality theory. We suggest that the theory might be used in general to explain the mechanism of syntactic change triggered by language use.<sup>1</sup>

## 1 Introduction

The existence of nominal prominence hierarchies is a robust typological finding ([8],[33],[13]) and as such deserves the attention of more theoretically oriented linguistics. Several hundreds of the world's described languages display the phenomenon of differential subject or object marking (DSM, DOM) which can be summarized as below:

- **DSM:** Given a prominence hierarchy, the subject is likely to be marked if lower in prominence.
- **DOM:** Given a prominence hierarchy, the object is likely to be marked if higher in prominence.

An example of differential object marking from Farsi ([8]:65) is given in (1). Note that the direct object definite NP is case marked, while no marking occurs on the indefinite non-specific NP.

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<sup>1</sup>This paper is a revised version of Nilsenová, M. (2002) 'The Pragmatics of Differential Object Marking' which appeared in *The Proceedings of the 2002 ESLLI Student Session*, M. Nissim (ed.). I am particularly grateful to Paul Dekker for his comments regarding the earlier version of the paper and to Kevork Bardakjian, Melanie Keledjian and Zareh Zeitlian, without whose help it would have been impossible to write on the topic. All remaining mistakes are my own.

- (1) *ketâb.râ* / *ketâb*      *mi.xân.ad*  
 book.ACC / book. $\emptyset$       CONTIN.read.3SG  
 “He’s reading the book/one or another book.”

The two most common prominence hierarchies are the **animacy scale** “HUMAN > ANIMATE > INANIMATE” and the **locality scale** “1,2 PRONOUN > 3 PRONOUN > DEF.NP > INDEF.SPEC.NP > NON-SPEC.NP”, which in individual languages can be either combined and/or more fine-grained [33]. Languages also differ in where they place a cut-off point on the prominence hierarchy. For example, some languages may completely exclude inanimate subject in transitive clauses, while others just overtly mark them. Common morphological markers used in different languages are case morphemes (Sinhalese [20], Turkish [10], Farsi [26], Dyirbal [33], Slavonic languages [31]) or pre-/postpositions (Spanish, Hindi [28], Portuguese, Catalan [34], Aramaic, variants of Arabic), articles (Asia Minor Greek [15], Western Armenian), verbal morphemes (Algonquian languages, Macedonian, Russian) and voice (English [13], Coast Salish and many others).<sup>23</sup>

## 2 Aissen’s OT Account

J. Aissen ([1],[2]) gives an optimality-theoretic account <sup>4</sup> of DSM and DOM, using the operation of Harmonic Alignment to combine the prominence scales with the **relational scale** SUBJ > OBJ into OT constraints. The absence of marking is penalized by the constraint  $*\emptyset$  conjoined with aligned subhierarchies, e.g.,  $*Oj/Pro \& * \emptyset$ , prohibiting the occurrence of an overtly unmarked pronominal direct object. The language-dependent cut-off point imposed over the hierarchies is expressed by an economy constraint on the *presence* of marking,  $*STRUC$ . Finally, for languages where differential marking is determined by a combination of the prominence hierarchies, Aissen proposes a two-dimensional lattice. For the Farsi example, the hierarchy  $*Oj/Pro \& * \emptyset \gg *Oj/Name \& * \emptyset \gg *Oj/Def \& * \emptyset \gg *Oj/Spec \& * \emptyset \gg *STRUC \gg *Oj/NSpec \& * \emptyset$  correctly results in specific indefinite patients being marked overtly with case (viz the tableau in (2)).

(2)

	$*Oj/Df \& * \emptyset$	$*Oj/Sp \& * \emptyset$	$*STRUC$	$*Oj/NSp \& * \emptyset$
$\Rightarrow$ ACC			*	
$\emptyset$		*!		*

<sup>2</sup>For example in English, as noted by [13], a construction with indefinite inanimate agent and human experiencer is rather expressed using the passive, cmp. *A bus has just run John over.* vs. *John has just been run over by a bus.*

<sup>3</sup>The prominence hierarchies may also influence the possibility of pro-drop [3].

<sup>4</sup>OT is a representational theory in which typological differences among languages are ascribed to differences in resolution of conflicting universal rules. For an overview, see [18].

Aissen’s proposal loses some of its attractiveness once we consider languages in which there is an interaction between types of subjects and types of objects. For example, Jacalteco (a Mayan language, spoken in Guatemala) and Halkomelem (Central Salish, Canada) exclude inanimate subjects in transitive clauses, and Tzotzil (Mayan, Mexico) and Chamorro (Malayo-Polynesian, Guam) exclude inanimate subjects in transitive clauses with human objects. For these languages, Aissen has to postulate a set of complex constraints (e.g., a highly ranked  $*Su/Inan \& *Oj/Hum$ ), which are no longer universal.<sup>5</sup> Even more problematic are languages in which the object (subject) marker seems to be used context-dependently, in case the speaker assesses the likelihood of confusion between the subject and the object to be high (e.g., in the language Hua (Khoisan, Botswana), [13]:123, or in Modern Western Armenian, to be discussed shortly). Finally, as pointed out by [36], another potential difficulty with Aissen’s approach is that Harmonic Alignment as an operation can only be used if at least one of the aligned scales is binary. Thus for a scale SUBJECT > DIRECT OBJECT > INDIRECT OBJECT which contains three elements, two conflicting harmony hierarchies would be derived for the direct object.

In our research, we focus on the category of languages which use differential marking in a pragmatic way. We will describe the previously unanalyzed phenomenon of dative-accusative alternation in Modern Western Armenian (MWA) and propose an analysis in terms of weak bi-directional OT. Since the analysis concerns mechanisms on the syntax-pragmatics interface, it is in principle compatible with any other proposal dealing with the *purely syntactic* effects of DOM and DSM (assuming that these effects take place in an independent syntactic module which is subject to its own rules).

### 3 Data

... with the majority of verbs the subject and object are not distinguished by any change in form but merely by their position in the sentence; i.e., the nominative and accusative cases are identical in form. (Bardakjian & Thomson, A Textbook of Modern Western Armenian)

In Modern Western Armenian (MWA),<sup>6</sup> two kinds of differential marking can be found:

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<sup>5</sup>The operation of conjoining some constraints but not others, in fact, appears quite *ad hoc* in general, as pointed out by [36].

<sup>6</sup>Modern Western Armenian is an Indo-European language spoken in Armenian communities in the diaspora. Both in its grammar and in its lexicon, it differs from Modern Eastern Armenian spoken in Armenia and elsewhere. It has flexible word order with canonical SOV and a quite rich inflectional system [5]. The empirical observations used here are based on the colloquial Beirut Western Armenian.

- **the suffix** -ը/ն (otherwise specificity marker): inanimate singular non-specified quantity nouns in subject positions (3), animate proper names in subject and object positions (4) and the 3rd person proximate pronoun ինք ‘ink’ in direct object positions;
- **the dative case** (instead of zero-accusative): optionally with some verbs on direct objects that are pronominal, specific and/or human (5,6) or non-human animate (with decreasing tendency); if the verb also takes indirect object there is a preference to use accusative for the direct object and dative for the indirect object (7).<sup>78</sup>

- (3) a. 

Խնձորը	համով	է:
<i>χntsore'</i>	<i>hamov</i>	<i>e :</i>
apple-ART	tasty	is

 “Apples are tasty.”
- b. 

Խնձոր	կը	սիրեմ:
<i>χntsor</i>	<i>ge'</i>	<i>sirem</i>
apple.∅	PRT	like-1SG

 “I like apples.”
- (4) a. 

Տիգրան	Մարիամը	կը	սիրէ:
<i>dikran</i>	<i>mariamé'</i>	<i>ge'</i>	<i>sire :</i>
Dikran	Mariam-ART	PRT	love-3SG

 “Dikran loves Mariam/‡ Mariam loves Dikran.”
- b. 

Տիգրան(ը)	Մարիամ(ը)	կը	սիրէ:
<i>dikrane'</i>	<i>mariamé'</i>	<i>ge'</i>	<i>sire :</i>
Dikran(-ART)	Mariam(-ART)	PRT	love-3SG

 “Dikran loves Mariam/Mariam loves Dikran.”

The use of both the specificity marker and the dative-accusative alternation is subject to great speaker variation, spreading rapidly in spoken language but not quite acceptable yet in written language (and certainly not codified, with the exception of a few isolated examples). Describing the phenomena, we are thus truly witnessing a language change in progress.

- (5) a. 

Տիգրանը	աղջիկին/աղջիկը	ծանօթացուց:
<i>dikrane'</i>	<i>aghčigin/aghčige'</i>	<i>dzanotatsuts</i>
Dikran-ART	girl-DAT-ART/∅-ART	introduce-PAST-3.SG

 “Dikran introduced the girl.”

<sup>7</sup>The transliteration given under the Armenian examples is intended to give the reader an impression of the pronunciation and is not based on any phonological theory. For information regarding the phonology of Modern Western Armenian and an IPA-based transliteration key, see [35]. The *e'* in the transliteration employed here should be pronounced as a schwa.

<sup>8</sup>The ‡-symbol indicates semantic anomaly.

- b. **Տիգրանը**      **գիրքը/ ??գիրքին**      **ծանօթացուց:**  
*dikrane'*      *kirke'/kirkin*      *dzanotatsuts*  
 Dikran-ART book-Ø-ART/??DAT-ART introduce-PAST-3.SG  
 “Dikran introduced the book.”
- (6) a. **Տիգրանը**      **մարդ մը**      **նկատեց:**  
*dikrane'*      *mart me'*      *ngadets*  
 Dikran-ART man-Ø a notice-PAST-3.SG  
 “Dikran noticed a man.”
- b. **Տիգրանը**      **մարդուն**      **նկատեց:**  
*dikrane'*      *martum*      *ngadets*  
 Dikran-ART man-DAT-ART notice-PAST-3.SG  
 “Dikran noticed the man.”
- (7) **Տիգրանը**      **աղջիկը/ ??աղջիկին**      **տղուն**      **ծանօթացուց:**  
*dikrane'*      *aghčige'/aghčigin*      *dghun*      *dzanotatsuts*  
 Dikran-ART girl-Ø-ART/??DAT-ART boy-DAT-ART introduced  
 “Dikran introduced the girl to the boy.”

The data are problematic for the OT approach outlined in the previous section for four reasons: (i) there exist two different types of markers with unclear cut-off points,<sup>9</sup> (ii) the dative-accusative alternation is partly lexicalized, i.e., it occurs with a subgroup of verbs that do not form any natural semantic class in the sense of [27],<sup>10</sup> (iii) the presence of an indirect object influences the use of dative on direct objects, i.e., we are dealing with a ternary relational scale, and (iv) the presence of the dative marker is context-dependent, as its purpose is to resolve a potential ambiguity between the agent and the patient.<sup>11</sup>

Note that an adequate analysis of the MWA facts is of broader typological relevance, given that a case alternation similar to that described for MWA can be found in a number of other languages, a.o., Spanish, Hindi, various Italian dialects, Catalan, Maltese, Aramaic and Iraqi Arabic (viz [30] for a summary and references).<sup>12</sup> For example, Spanish transitive verbs

<sup>9</sup>The facts concerning the use of the suffix *-ը/ին* are further complicated by the fact that the suffix also serves as the specificity marker [32].

<sup>10</sup>Examples of other verbs which allow for the dative to override the accusative are *անիծել* - ‘to curse’, *առաջնորդել* - ‘to lead’, *արգոնել* - ‘to allow’, *բերել* - ‘to bring’, *գրգռել* - ‘to provoke’, *գրկել* - ‘to embrace’, *տանել* - ‘to bring’, *հալածել* - ‘to persecute’, *սաքնել* - ‘to betray’, *ղրկել* - ‘to send’, *ներկայացնել* - ‘to submit’, *տեսնել* ‘to see’, *դատել* - ‘to judge’ or *դատապարտել* - ‘to condemn’.

<sup>11</sup>For this reason, it is also not possible to make use of [7]’s approach with probabilistic constraint ranking, where variable outputs may be understood as the result of closely ranked constraints.

<sup>12</sup>In Afrikaans, a comparable alternation can be found, involving the definiteness hierarchy: non-scrambled animate definite NPs can appear with the particle *vir*, originally a

normally assigning accusative to direct objects can also assign dative when the object NP is as high or higher in the animacy hierarchy as the subject [21]. The operation of ‘dative overriding’ is apparently quite common with transitive psych verbs, but the group of verbs which allow for the optional alternation cannot be straightforwardly characterized semantically or syntactically. Given that dative overriding takes place also in constructions where no subject/object confusion can arise, the ambiguity resolved by the use of the dative most likely concerns not the syntactic, but the *semantic* roles of the NP’s (in particular, the distinction between an experiencer and an instrument in the sense of [19]).

In order to capture these facts, we will propound a theoretical which takes into consideration the influence of pragmatics on syntax that the phenomenon of differential marking apparently exhibits in Modern Western Armenian and other languages mentioned above. Specifically, we will make use of the recent proposals by [6] and [17], based on the Radical Pragmatics of [24] and [4], which appear to be particularly suited to capture the syntactic-pragmatic interplay.

## 4 BiOT - A Game-theoretical Approach

In Radical Pragmatics, Grice’s maxims of rational conversation exchange [22] are reduced to two principles: the **Q-principle** (Grice’s first maxim of quantity), which compares possible syntactic expressions the speaker could have used to communicate the same meaning, and the **I/R-principle** (the second maxim of quantity and the maxim of relation), which compares possible interpretations for the same syntactic expression and seeks to select the most typical/coherent interpretation.

- **Q-principle:** Say as much as you can, given I.
- **I/R-principle:** Read as much into an utterance as you can, given Q.

The motivation for these two principles can be derived from the law of least effort in language use [37]. The Q-principle minimizes hearer’s effort to dative preposition [29].

- (i) a. *dat ek hom gister gesien het*  
       that I him yesterday seen have  
       b. *dat ek gister \*(vir) hom gesien het*  
       that I yest. for him seen have

It is not clear what drives the optionality behind the use of the particle, but compared to the Armenian and other facts, its role is clearly more grammaticalized, as witnessed by its obligatory appearance with pronouns (ib).

understand, while the I/R-principle minimizes speaker’s effort to communicate. Both principles in combination maximize the informativity of the communicative exchange [17]. [6] formulates the two conflicting principles in a bidirectional optimality theory, where possible syntactic outputs are compared to each other with respect to possible interpretations and *vice versa*. The mechanism of selecting the optimal  $\langle form, meaning \rangle$  pair can be represented in a strategic game form, as in (8).

(8)

	$m_1$	$m_2$
$f_1$	○ ←	
$f_2$	↑	↓ ○

The horizontal arrows indicate hearer’s choices: for  $f_1$ , she prefers the interpretation  $m_1$ , while for  $f_2$ , she would opt for the interpretation  $m_2$ . Similarly, the vertical arrows indicate speaker’s choice: if she were to express the content  $m_1$ , she would choose  $f_1$ , while for  $m_2$  it would be  $f_2$ . The decision process reflects the conventionality of associating certain forms with certain meaning (for the hearer), and the economy of expression, i.e., the phonological or syntactic complexity, as well as her communicative intentions for the speaker. The optimal candidates  $\langle f_1, m_1 \rangle$  and  $\langle f_2, m_2 \rangle$  in (8) constitute so called Nash equilibria: each player’s best response to other player’s action (which is not necessarily the generally best possible result the player might prefer).

Unfortunately, the process of candidate selection just described (referred to in the literature as strong optimality) would exclude the use of marked expressions because they are less optimal compared to their unmarked counterparts. Thus [6] argues that the marked interpretation of periphrastic causatives, as in (9) would not come out as an optimal candidate.<sup>13</sup>

- (9) a. *He caused the sheriff to die.*  
 b. *He killed the sheriff.*

An alternative notion of weak bidirectional optimality ([25]) which allows for the use and interpretation of marked expressions is given in (10), where the relation  $\succ$  is transitive and well-founded and is to be understood as ‘more economical than’.

- (10) A form-meaning pair  $\langle f, m \rangle$  is weakly optimal iff:  
 (Q) there is no other optimal pair  $\langle f', m \rangle \succ \langle f, m \rangle$

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<sup>13</sup>It is not entirely clear what the notion of “alternative form with the same meaning” stands for here, since (9a) and (9b) do not have the same LF representation. For our purpose this is insignificant, however, since we are concerned with the notion of weak optimality as such, not with the examples on which it was founded.

(I/R) there is no other optimal pair  $\langle f, m' \rangle \succ \langle f, m \rangle$ .

It is convenient to calculate weakly optimal candidates with the algorithm based on [25]:

```
OPT:=  $\emptyset$ ; BLO :=  $\emptyset$ ;  
while GAM  $\neq \emptyset$   
OPT:= OPT  $\cup \{(f, m) \notin BLO \mid \neg \exists (f', m') \in GAM : (f', m') \succ (f, m)\}$ ;  
BLO:= BLO  $\cup \{(f, m) \notin OPT \mid \exists (f', m) \text{ or } (f, m') \in OPT\}$   
GAM:=  $\overline{OPT \cup BLO}$   
return OPT;
```

where GAM is initially the set of all candidates produced by the Generator, OPT the set of optimal candidates and BLO the set of blocked candidates.

Perhaps more graphically, weak optimality can also be represented in a strategic game form as an ‘updated Nash Equilibrium’ where the process of “weakening” eliminates all arrows which point to arrows leading to Nash Equilibria (viz below).

In general, given its focus on the role of communicative interaction in the form-function pairing, BiOT appears to be a suitable theory for describing the crucial component in the mechanism of language change, the so-called ‘coordination problem’: for any innovation, the hearer has to be able to decode the speaker’s meaning [12]. The coordination problem is not always recognized in the literature of language change but is discussed in detail by [14]. In the sense of his ‘theory of utterance selection’, we suggest that it is the hearer’s principle that stands behind the conventional social process of selection, while the speaker’s principle provides the frequent functional motivation for altered replication (i.e., innovation).

To be complete, an analysis of a particular phenomenon also has to include an explanation of how the change in question was made possible in the first place. (For instance, why don’t all languages use dative on their marked direct objects?) We will return to the issue of “a crack in the system of conventions” ([14]) in the discussion.

## 5 Analysis

In this section, we will show how an analysis in terms of BiOT can represent the use of the definite article and the dative case for differential marking in Modern Western Armenian. As remarked above, the differential marking in MWA is context dependent: it is used by some speakers in certain contexts,

with the purpose of avoiding a potential ambiguity in sentential roles.<sup>14</sup> We assume that for those contexts where it is easy to distinguish between the subject/agent and the object/patient/experiencer, the ‘games of interpretation’ are simply as indicated in (12) for (11a), where the speaker prefers to use zero-marking for both DPs and the hearer does not have to make any choices because the interpretation is clear.<sup>15</sup>

- (11) a. *Տիրան*      *Մարիամ*      *կը*      *սիրէ:*  
*dikran*      *mariam*      *ge'*      *sire*  
 Dikran      Mariam      PRT      love-3SG  
 “Dikran loves Mariam/Mariam loves Dikran.”
- b. *Տիրան*      *Մարիամը*      *կը*      *սիրէ:*  
*dikran*      *mariamə'*      *ge'*      *sire*  
 Dikran      Mariam-ART PRT      love-3SG  
 “Dikran loves Mariam/ՃMariam loves Dikran.”

(12)

	subject		object
PN+∅	↑	PN+∅	↑
PN+ARTICLE		PN+ARTICLE	

However, in a context where the division of roles in the clause is ambiguous, given that a proper name is a marked object (patient/experiencer), a ‘real’ game will be played. As in (11a/12), the speaker prefers to use zero-marking for both DPs (which requires least effort from her). Note that strong optimality will not give a solution here, as shown in (13a). The reason is that the hearer prefers the conventional association of proper names with subjects and not with objects.

(13) a.

	subject	non-subject	
PN+∅	○ ←		
	↑		↑
PN+ARTICLE		←	

(13) b.

	subject	non-subject	
PN+∅	○ ←		
	↑		
PN+ARTICLE			○

<sup>14</sup>The ambiguity is most likely to be semantic but in the analysis presented here, we will not distinguish between the syntactic and the semantic role of the DPs.

<sup>15</sup>The ‘speaker’ and ‘hearer’-roles here should be understood in a metaphorical sense. The actual speaker and the actual hearer do not play the games described here; the games are a representation of the speaker’s reasoning process behind selecting the optimal form-meaning pair so that she could communicate the intended message with least possible effort and still be understood.

Only after an update of the strategic form in (13a), eliminating arrows pointing to arrows that lead to a Nash equilibrium, i.e., under weak optimality, we get a solution for what form the object should assume, as shown in (13b). There are two Nash equilibria in the game now, corresponding to the pairs  $\langle \text{subject}, PN+\emptyset \rangle$  and  $\langle \text{object}, PN+ARTICLE \rangle$ .

The account is similar for the dative-accusative alternations, repeated here for convenience under (14):

- (14) a. **Տիրքանը աղջիկին/աղջիկը ծանօթացուց:**  
*dikrane' aghčigin/aghige'* *dzanotatsuts*  
 Dikran-ART girl-DAT-ART/ $\emptyset$ -ART introduce-PAST-3.SG  
 “Dikran introduced the girl.”
- b. **Տիրքանը գիրքը/??գիրքին ծանօթացուց:**  
*dikrane' kirke'/kirkin* *dzanotatsuts*  
 Dikran-ART book- $\emptyset$ -ART/??DAT-ART introduce-PAST-3.SG  
 “Dikran introduced the book.”

If the context is unambiguous for (14a), both DPs will appear caseless, as shown in (15). However, if from the context it is not clear what the division of roles is (the DP ‘girl’ being [human, animate, specific] and thus a good candidate for the subject/agent), a game of differential object marking will be played (16) with the two optimal meaning-form pairs selected under weak BiOT. As before, the speaker prefers to use no phonologically overt marking; the hearer prefers the conventional association of case marking with a non-subject. Given these assumed preferences, we correctly predict that the optimal form-meaning pairs will be those that appear in the example above (14a). Note that in (14b), given that the object ‘book’ in this sentence is inanimate, the chance of a contextual ambiguity is very low (hence the low likelihood that the object will appear in dative).

(15) a. 

	subject
NP+ $\emptyset$	↑
NP+CASE	

 b. 

	object
NP+ $\emptyset$	↑
NP+CASE	

(16) 

	subject	non-subject	
NP+ $\emptyset$	○	←	
NP+CASE	↑	→	○

As it turns out, we can also account for the otherwise puzzling use of the definite article on inanimate non-specific subjects in generic sentences, as in (17a), compared to (17b) where the same noun is in the object position and appears without an article. We assume that given the features of the

DP in (17a) which make it a highly marked subject, the hearer is likely to interpret the expression as having a different role in the sentence.

- (17) a. **Խնձորը համով է:**  
*χntsore' hamove*  
 apple-ART tasty is  
 “Apples are tasty.”
- b. **Խնձոր կը սիրեմ:**  
*χntsor ge' sirem*  
 apple.∅ PRT like-1SG  
 “I like apples.”

The speaker prefers to use no marking, while the hearer prefers the conventional association of an inanimate noun with a non-subject role. As before, the strong optimality would not give a solution for a marked expression and an updated Nash Equilibrium is used instead (18).

(18) a.

	subject	non-subject	
NP+∅		→	○
	↑		↑
NP+ARTICLE		→	

(18) b.

	subject	non-subject	
NP+∅		→	○
			↑
NP+ARTICLE	○		

In (17b), on the other hand, ‘apple’ is not a marked expression in the sentential position in which it is used and, presumably, no contextual ambiguity can arise.

Finally, we treat the interesting case of ditransitive verbs. Note that while in principle, the direct object could appear with a dative case in the sentence if the indirect object were dropped, it is unlikely to do so if the indirect object is present (19).

- (19) **Տիգրանը աղջիկը/ ??աղջիկին փրում ծանօթացուց:**  
*dikrane' aghčige'/ aghčigin dghun dzanotatsuts*  
 Dikran-ART girl-∅-ART/??DAT-ART boy-DAT-ART introduced  
 “Dikran introduced the girl to the boy.”

We leave the proper name out of the picture, given that its subject role and zero-marking is optimal from both the speaker’s and the hearer’s perspective. As for the two animate nouns in direct and indirect object positions, we assume that for both, the speaker has the preference to use no case marking. It is difficult to say what the hearer’s preferences are in this case, but

we will assume that she conventionally associates nouns in dative with the experiencer role (and hence with the indirect object). The updated game in (20) gives us the correct solution:

(20) a.

	direct object	indirect object	
NP+ $\emptyset$	○	←	
	↑		↑
NP+CASE		→	

(20) b.

	direct object	indirect object	
NP+ $\emptyset$	○	←	
	↑		
NP+CASE		→	○

Note that in principle, it is possible to ‘play the game’ with more than two form and/or meaning options (it just becomes more difficult to represent the game in the strategic form employed throughout this paper; the algorithm stated above appears more suitable in that case).

To sum up, we have shown in this section that the contextually dependant differential marking in Modern Western Armenian can be given a bidirectional OT analysis, in which the syntactic output is evaluated by a pragmatic module represented as a speaker-hearer game about the optimal form-meaning pairs. Given that we were dealing with marked expressions associated with a marked form, it was necessary to employ weak BiOT where the optimal candidates are calculated by means of Jäger’s algorithm and can be graphically represented as ‘updated’ Nash Equilibria. In the games, we have made assumptions regarding speaker’s and hearer’s preference which seemed sensible and simple enough (the speaker prefers to use no phonologically overt marking, the hearer prefers the conventional interpretation of human/animate DPs as subjects/agents and inanimates as objects/patients), though sometimes (as in (20)), the hearer’s preferences were not entirely obvious. If at all possible, more empirical research would be needed to give support (or otherwise) to the choices we have made.

## 6 Summary and Discussion

Is grammar independent of language use? Mainstream linguistics (based on [16],[11]) assumes that this is so, but there is evidence that grammar is (at least partly) determined by discourse exigency. E.g., [23] derives several typological generalizations from parsing needs and [9] assembles arguments in support of the hypothesis that grammar arises through iterated adaptation to discourse, driven by the participants’ inclination to minimize their communicative effort. The present contribution is in harmony with the latter

assertion, in fact, we have shown that structural case assignment can sometimes be directly ordained by pragmatic requirements. To account for the facts, we used the framework of Bi-OT in which the choice of a marker is determined by two competing principles, striving for minimization of communicative and interpretative effort.

In principal, the proposal is compatible with any theory regarding the purely syntactic, grammaticalized differential marking (as can be found, e.g., in Czech), since we look at the process of choosing among possible grammatical outputs of the syntactic module, rather than at the grammatical rules that produce the outputs. However, it is necessary to define the relation between the pragmatic component and the syntactic component. For example, regarding the rise of the dative-accusative alternation, we can speculate that it becomes possible through reinterpretation of the semantic role of the first object with a class of ditransitive verbs allowing for indirect object drop, and a subsequent expansion of contexts (as, e.g., in the case of the English infinitival marker). In [14]’s terms, the change thus involves both HYPERANALYSIS, when dative is reanalyzed as the case required by a certain verbs on their objects, rather than the case of a particular *kind* of objects, and HYPOANALYSIS when the group of verbs allowing for dative direct objects is enlarged. In the second stage of hypoanalysis, the initially optional alternation can become grammaticalized. To support the hypothesis, one could look at the relevant (sub-)groups of verbs in languages with dative-accusative alternation and at the historical development of those languages where dative has fully replaced the original accusative (as seems to be the case, e.g., in Eastern Armenian).

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