Case for the OT Case assignment.

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1. Introduction: overview of the Case assignment problem in syntax.

Case assignment in syntax is an interesting, if problematic, area to test theoretical propositions of syntax. While a minimalist program handles English cases (or, rather, a lack of them) well, languages with varied arrays of overt cases are less accounted for in either version of minimalist syntax. For example, how can we account for intransitive constructions in split ergative languages (e.g. Dyirbal) with unmarked subject? How is Dative case licensed on subjects, e.g. in Russian and German (given the minimalist program, where D-structure case assignment does not apply)? Finally, how can syntactic theory account for the presence of multiple cases in some languages and virtually no cases in others?

This paper investigates the phenomenon of Case assignment in OT syntax and suggests a uniform input and mechanism of syntactic analysis for Case assignment. We propose that the input for OT analysis should be the verb with its theta roles, and the arguments that these theta-roles can be assigned to.

Predictions of Case assignment for languages with split ergativity provided by Aissen (2000) are inconsistent, as the researcher admits: the intransitive sentences are not accounted for. On the other hand, Woolford (2000) has proposed an alternative account, which makes allowance for both structural and inherent cases, by using inherent Cases in the input. This is a problematic approach, because Cases are syntactic structures, and using them as input for syntactic analysis is a palliative measure. We suggest that the verb, its theta-roles, and arguments, should be taken as input.

The first part of this paper examines Case assignment as accounted for by the latest developments in syntactic theory.   The second part elaborates on the proposition of

uniform input for syntactic analysis of Case, the underlying reasons for it, and the benefits of using "straight-from-the-lexicon" input. This paper limits the discussion to several most prominently discussed Cases: Nominative, Accusative, Dative, and Ergative (a possible extension to other Cases is discussed briefly in the final part of the paper). In the third part, the proposed approach is applied to several problematic cases, including Dative subject, and Dyirbal patterns of split ergativity. The discussion demonstrates factorial typology of Case assignment analysis resulting from the proposed approach. The conclusion outlines possible further applications of the approach and summarizes the findings of this work.

2. Background: State-of-the-art Case assignment in OT literature.

There are several assumptions that hold in syntax as it is treated by OT. First, the minimal input for OT is the verb with appropriate number of NPs. While the tree structure itself is not a part of the input, it is understood that Case assignment proceeds according to the practice of syntactic theory. That means the candidate set consists only of arguments with Case which can be licensed under the minimalist theory. While Aissen (2000) did not take interest in specific case assignment, but rather in marked vs. unmarked cases, Woolford suggested that some verbs assign lexical ('quirky') case (often, dative), while others do not (therefore, it does not appear). Common agreement is that Nominative case is licensed by Tense node, and Accusative is licensed inside the VP.

The problems which arise in application of standard Case Licensing principles (Chomsky 1995), where the Case licensing feature of the local head determines the Case of an argument, can be classified into two types:

- **Dependency effect**: Case of Objects depends on the Case of the Subject, as in Icelandic, Hindu (Yip, Maling and Jackendoff 1987)

- **Valency effect**: Case of an argument depends on whether the verb is transitive: ergative subjects are limited to ergative clauses, e.g. in Dyirbal (Aissen 2000); distribution of dative is limited similarly.

OT suggested several approaches to solving these:

1) Placing restrictions on licensing Accusative (also known as Burzio's generalization);

2) Placing local restrictions on Case marking (Aissen 2000)

3) Varying the ranking among principles, which were associating Cases with arguments, so that Nominative is assigned before Accusative (Legendre, et al 1993);

4) Proposing competition among markedness and faithfulness constraints, where some cases are less marked then others, and Dative is present at the input as a verbal case assignment, making a faithfulness constraint (Woolford, 2001).

The latter approach stayed in complete accord with minimalist theory used as input, and accounted for split ergative and split dative languages. It also helped to account for Accusative and Dative subjects by way of competition between markedness and faithfulness constraints. However, it used Case (namely, Ergative and Dative) as input for syntactic analysis (the next chapter of the present paper deals with the problems such approach creates).

2.1. Case Licensing in Minimalist approach.

Currently, it is proposed that there are two ways to license Case on nominals. The structural Case is assigned during the building of the arboreal structure, and proceeds as follows:

1. **Nominative** is licensed by IP (or Tense) in spec-head relationship with Subject;

2. **Accusative** is licensed by V;

Inherent, or "quirky" Case is licensed by heads which assign certain theta-roles to their arguments. Generic correlations, suggested by Woolford (2001), are the following:

Dative Case is assigned to goals and experiencers; **Ergative** is assigned to agents; **Lexical Accusative** – to themes. Lexical **Accusative** can not be licensed on an external subject, but

it can be licensed on a VP-internal subject (the one carrying a theta-role of theme, and sometimes agent, recipient, or goal).

2.2. Case markedness and faithfulness constraints.

Markedness constraints for Case assignment are derived from Universal Case Markedness Hierarchy (Grimshaw 2001):

Nominative < Accusative < Dative

Universally Ranked Violable Case Markedness Constraints (Woolford, 2001):

*dative >> *accusative, *ergative >> *nominative

The constraints mean essentially "avoid specified case". *nominative can sometimes be dropped due to lowest rank: after all, this is the Case which surfaces in most languages. We can also allow dropping highest-ranked constraints for some languages. For example, if we support the notion of universality of all Cases, we would need a *Ergative constraint for English; however, it would need to be ranked as high as sufficient for it to never surface. This is another case when we can drop a particular constraint: it is ranked too high to influence the filtering process.

Another markedness constraint is formulated as a syntactic variant of Obligatory Contour Principle used in phonology (OCP_{case}) – it prohibits two (local) instances of the same Case.

Faithfulness constraints are derived by Woolford (2000) from the verb carrying a lexical feature licensing Case. A general variant of a faithfulness constraint is Faith-lex: a lexically specified inherent Case licensing feature must be checked. Similar to the way such constraints work in phonology (there are variants of faithfulness constraints which

hold only in restricted contexts, i.e. onsets or codas), Woolford postulates local restrictions of this constraint:

1. Faith-lex$_{trans}$ – Faith-lex holds only in transitive clauses (the functional argument for needing such context is that there is a need to prevent ambiguity between the subject and object).

2. Faith-lex$_{perf}$ - Faith-lex holds only in perfective clauses (there is a functional argumentation similar to one for Faith-lex$_{trans}$ from historical account for aspect).

3. Theoretical proposition.

Refining the constraints and the input: theta-roles as input from the lexicon; competition of the Cases for theta-roles.

While Woolford (2003) suggests that all Cases are universal cross-linguistically (i.e. in languages, where they do not surface, such as ergative in English, it is due to low ranking of faithfulness constraints), this position would mean that verbal Case assignment is a property of lexicon as well as of syntactic construction. While it is true that there is a difference between structural (Nominative, Accusative) and so-called "quirky"/inherent Cases (Dative, Ergative and possibly others), resigning half of treatment to lexicon, and half to syntactic structure is a less optimal treatment. Woolford (2000) herself admits of some drawbacks of this approach: "although Gen will generate candidates containing arguments with no Case as well as candidates with unlicensed Cases, these candidates are removed from the candidate set before the violable constraints apply, because they violate the universal principle requiring all arguments to have a licensed Case". This is absolutely true: the arguments cannot show up in the candidate set unless they have a licensed Case; but then there is no reason to generate such arguments either. A simple way to do that is to not use Case of any sort in the input; it is also logical, since the lexicon (an assumed syntactic input) does not provide for Case.

Our proposition is the following: let the input contain the verb and the internal arguments of it with corresponding theta-roles. What happens further? Cases compete for being checked on the arguments with certain theta-roles. A certain argument with a specific theta-role can be "covered" by several competing cases (this is supported by

the fact that there is cross-linguistic variation in which Case surfaces in a particular language), more or less marked. E.g. the theta-role of a benefactor would require Dative, if it is present in the language. The theta-role of the agent is the best candidate for the Nominative case, while the theme is the best one for the Accusative. However, *Nom, *Acc, *Dat are in a certain alignment in a particular language; this would account for certain cases surfacing much more often then others.

We will need to reformulate Faith-lex constraint in order to account for theta-roles in the input and Cases competing for assignment to arguments. In our case, general Faith-lex would encompass an array of constraints. So far we have stipulated, that certain theta-roles tend to occur with certain cases: Nom=agent, Dat=beneficiary, Acc=theme. Thus, the constraints can be formulated as *Nom=beneficiary, *Nom=theme, *Dat=agent, *Dat=theme, *Acc=agent, *Acc=beneficiary. However, spelling out each constraint is not necessary in each tableaux. Faith-lex will cover all of them, and in most cases will be a sufficient faithfulness constraint.

4. Application of the proposed approach.

a. Application to Dative subjects.

Dative subjects show variability in surfacing patterns. Woolford notes, that in Japanese, Dative subjects are not allowed in intransitive clauses, while being acceptable in transitive clauses. Russian and Icelandic, on the other hand, allow Dative subjects to surface in both transitive and intransitive clauses. English allows neither. The three constraints, which Woolford proposes to account for this variability are *Dative (avoid marked Dative), Faith-lex (we reformulate it to satisfy theta-role requirements for Case), and Faith-lex$_{trans}$. The possible rankings of the constraints are:

1) *dative>> Faith-lex$_{trans}$ >> Faith-lex

2) Faith-lex$_{trans}$>> *dative >> Faith-lex (Japanese)

3) Faith-lex$_{trans}$ >> Faith-lex >> *dative (Russian, Icelandic)

Japanese tableau for a hypothetical sentence with a theta-role of the beneficiary would look as follows:

Tableau 1. Second type of constraint ranking, intransitive sentence. (Japanese)

Input: NP(Benef.) V[Benef.]	Faith-lex$_{trans}$ (does not apply)	*dat	Faith-lex	*acc	*nom
a. NP(Benef)-dat		*!			
☞ c. NP(Benef)-nom			*!		*

No Dative subject surfaces, despite an existence of a theta-role of beneficiary. While Woolford argues that Dative never overtly surfaces in English, and thus belongs to the first group.

Tableau 2. Second type of constraint ranking, transitive sentence. (Japanese)

Input: NP(Agent) V[Benef., Theme] NP(Benef)	Faith-lex$_{trans}$	*dat	Faith-lex	*acc	*nom
a. NP(Agent)-nom NP(Benef)-acc	*!	*			*
b. NP(Agent)-nom NP(Benef)-nom	*!	*		*	
☞ c. NP(Agent)-nom NP(Benef)-dat		*	*	*	*

Russian is an example of the third type of ranking:

Mne skuchno. (intransitive)

I.Dat bore

I am bored (literally, "to me boredom happens": Dative subject in an intransitive

sentence)

This Case assignment is illustrated by Tableau 3.

Tableau 3. Russian intransitive sentence with Dative subject.

Input: NP(Benef.) V[Benef.]	Faith-lex	*dat	*acc	*nom
a. ☞ NP(Benef)-dat		*		*
c. NP(Benef)-nom	*!		*	*

Dative subject can also surface in transitive sentences:

Mne nravitsya kniga. (transitive)

I.Dat like   book.Nom

I like the book (Dative subject, Nominative object in a transitive sentence)

Tableau 4. Russian transitive sentence with Dative subject and Nominative object.

Input: NP(Benef.) V[Benef., Theme] NP(Theme)	Faith-lex	*dat	*acc	*nom
a. ☞ NP(Benef)-dat NP(Theme)-nom		*		*
b. NP(Benef)-dat NP(Theme)-acc		*	*!	
c. NP(Benef)-nom NP(Theme)-acc	*!		*	*

(Note: we can also allow OT to assign syntactic roles, as Aissen has proposed, if we posit that NP with the theta-role of beneficiary is preferential for the subject position, whereas Theme NP is kept inside the VP as internal argument; however, this is not a part of the present analysis).

b. Application to Dyirbal split ergativity (extension on Aissen).

If we return to J. Aissen's analysis of subject choice in Optimality theory, we can account for the absence of marking on the subject in intransitive clauses in Dyirbal by way of postulating the same case-competition constraints. Aissen did not make it her goal to account for the specific case assignment: her research only deals with "marked" (Accusative, Ergative) and "unmarked" (Nominative, Absolutive) cases (See Table 1).

Table 1. Case marking in Dyirbal.

	Marked Unmarked			
	Acc-Nom		Abs-**Erg**	
Local subject-3rd object		S	O	
Local subject-local object	**O**	S		
3rd subject-3rd object			O	**S**
3rd subject-local object	**O**			**S**

However, the input that Aissen uses consists of Proto-Agent and Proto-Patient roles of proposed by Dowty 1991. We can suggest to convert them to theta-roles for the internal arguments: Agent and Patient. The following tableaux (1, 2) show the realization of the Case as analyzed by Aissen for transitive clauses:

Tableau 1. Dyirbal (first-person subject/third-person object)

V (Agt/1, Pat/3)	*ø$_c$&*Su/3	*øc&*Oj/Loc	*struc$_C$	*ø$_c$&*Su/Loc	*ø$_c$&*Oj/3
Agt/Su/1/case Pat/Oj/3			*!		*
Agt/Su/1 Pat/Oj/3/case			*!	*	
☞Agt/Su/1- Pat/Oj/3				*	*
Agt/Su/1/case Pat/Oj/3/case			*!*		

Tableau 2. Dyirbal (third-person subject/first-person object)

V (Agt/3, Pat/1)	*ø$_C$&*Su/3	*ø$_c$&*Oj/Loc	*struc$_C$	*ø$_c$&*Su/1	*ø$_c$&*Oj/3
Agt/Su/3/case Pat/Oj/		*!	*		
Agt/Su/3 Pat/Oj/1/case	*!		*		
Agt/Su/3- Pat/Oj/1	*!				
☞Agt/Su/3/case Pat/Oj/1/case			**		

This analysis does not attempt to account for realization of specific cases; "case" in the tableaux simply means "the marked case" (Ergative for subjects in 3rd person, Accusative for objects in local person) vs. "the unmarked case" (Nominative for local subjects and Absolutive for 3rd person objects, respectively).

Here, the faithfulness constraint Faith-lex can be used to prohibit Ergative and Nominative on an argument other then Agent. The same constraint prohibits Accusative and Absolutive on Agents (those are reserved for Themes, or objects). We are dealing exclusively with assigned cases here, which allows for more transparent analysis.

The ranking, which can account for such a distribution, has Faith-lex ranked higher then *ergative (assuming that ergative case is licensed by the verb).

Note, that *ergative constraint does not need to be language specific: it is sufficient to rank it high (as an extremely marked construction) for languages where it never surfaces, e.g. English.

Tableau 3. Dyirbal (third-person subject in intransitive sentence)

V (Agt/3)	*Faith-Lex	*Acc	*Erg	*Abs	*Nom
☞Agt/Su/3/ Nom					*!
Agt/Su/3 Erg			*!		
Agt/Su/3 Acc	*!	*			
Agt/Su/3/Abs	*!			*	

Tableau 4. Dyirbal (first-person subject in intransitive sentence)

V (Agt/1)	*Faith-Lex	*Acc	*Erg	*Abs	*Nom
☞Agt/Su/1/ Nom					*!
Agt/Su/1 Erg			*!		
Agt/Su/1 Acc	*!	*			
Agt/Su/1 Abs	*!			*	

The problem that Aissen faced in the analysis of intransitive sentences stemmed from the fact that she was treating Case as a "marking" on the nominal in the sentence, aimed solely at distinguishing subject from object (Aissen 2000, p 86). The reason her analysis did not render the correct predictions about Case in intransitive sentences was that she did not consider the fact that the verb does indeed "have information" about the external argument, as least insofar as it has to assign it a theta-role. More specifically, she was not dealing with Case assignment per se, but only with the split ergativity, trying to account for the fact that one language could use both ergative and non-ergative paradigms of Case marking. For the Ergative Case, Woolford (2001, p. 23) suggests that it is also an inherent Case. For Dyirbal, we need to formulate the faithfulness constraint Faith-lex so that it preserves the use of Nominative or Ergative for subjects (presuming they are both legally licensed, Nominative being licensed structurally, and Ergative being an inherent

case for non-local participant), and Accusative or Absolutive for objects. The constraints which we used to render correct results for intransitive sentences hold in the transitive sentences as well. Tableaux 5 and 6 are a re-analysis of Aissen's case (presented in Tableaux 1 and 2); the constraints are different, and include a specific Case markedness constraint ranking for participating Cases, which is in line with Grimshaw's Universal Case Markedness Hierarchy (as presented in part 2.2 of the present paper) and Woolford's constraint ranking for Case (also noted in 2.2). Here, instead of the "case –no case" dichotomy of Aissen we have presented the specific cases which surface in her analysis. Specifically, CASE (marked Case) for objects is Accusative, CASE for subjects is Ergative. The absence of a marked Case means, simply, the presence of an unmarked Case: Nominative in subjects, Absolutive in objects. This is presumed in Aissen's analysis; while she has no interest in what Case specifically surfaces in the sentence; she does account for whether it is marked or unmarked. The input we propose differs from Aissen's in that it has not only the verb with the theta-roles, but also the arguments which go with it. The reasoning for it is as follows: apparently, the speaker (and we are modeling at least the native speaker's output, if not cognitive processes) is aware of which arguments take on which role in the event structure: otherwise even a native speaker would not be able to compose a sentence. However, the Case is assigned to the arguments through constraint ranking, which is more then Aissen did in her analysis. The results we receive are identical to what Aissen has received (shown in Tableaux 1 and 2); by refining the input and limiting the task of OT, in this case, to Case assignment, we are able to improve on the earlier results, which only aimed to account for specific split ergativity patterns.

Tableau 5. Dyirbal (first-person subject/third-person object)

V (Agt, Pat), NP [agent, local person], NP [patient, 3rd pers.]	*Faith-Lex	*Acc	*Erg	*Abs	*Nom
Agt/Su/1/ Acc Pat/Oj/3/Erg	*!*	*	*		
Agt/Su/1/Nom Pat/Oj/3/Acc		*!			*
☞Agt/Su/1/Nom Pat/Oj/3/Abs				*!	*
Agt/Su/1/Erg Pat/Oj/3/Acc		*!	*		

Tableau 6. Dyirbal (third-person subject/first-person object)

V (Agt, Pat), NP [agent, 3rd person], NP [patient, local]	*Faith-Lex	*Acc	*Erg	*Abs	*Nom
Agt/Su/3/Acc Pat/Oj/Abs	*!	*		*	
Agt/Su/3/Nom Pat/Oj/1/Erg	*!*		*		*
Agt/Su/3/Nom Pat/Oj/1/Abs	*!			*	*
☞Agt/Su/3/Erg Pat/Oj/1/Acc		*!	*		

As proposed earlier in this paper, it is possible that a syntactic role can also be assigned through interaction of constraint ranking with theta-roles. Aissen (2000) has also presented a model of syntactic role assignment through the interaction of argument structure with the thematic prominence of the arguments. However, while these issues are important to keep in mind for the sake of grounding the theory, such possibilities are outside of the scope of the present analysis.

5. Conclusion. Emerging issues and further research questions.

The contribution of this work to OT syntax is the proposition on the strictly lexical input and the role of OT in assigning Case. We need to "feed" a syntactic theory in order to apply OT methodology (in our case, the minimalist approach); however, what we take as input for OT is a vital decision. In syntactic theory, the input presumably comes straight from the lexicon (currently, however, this is by far not the standard in OT syntax). Nominals have appropriate animacy, person, and gender characteristics (inherent semantics), and verbs have theta-roles associated with them. Cases are assigned and checked later, (as well as agreement). The fact that allowing the theory to assign Case at the same time solves the problems which Minimalism could not (i.e. the one of ergative languages and split ergativity, as well as languages with scrambled word order and Dative subjects), proves OT an appropriate instrument. The predictive power it has regarding a wider range of languages, as well as the theoretical and computational questions it brings up for the syntactic theory, prove it a useful instrument.

Further work on Case assignment in OT could attempt to address several questions, which surface in relation to violability in Case assignment. For example, whether the animacy plays a role in determining the Case, or whether arguments, which take up certain theta-roles, can compete for syntactic positions. It might be interesting to see if in a sentence with a theme and a beneficiary, the second one could occupy the object position. And, finally, in order to account for precisely how Cases (all possible ones, since this is the cross-linguistic claim of OT) correspond to theta-roles (all possible ones), a more elaborate account of theta-theory and Case theory would be necessary.

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