Ergativity and accusativity
as lexical systems

Moravcsik (1978) argues that there are ergative patterns in accusative languages, and accusative patterns in ergative languages.

But there is skewness in the distribution of patterns and number of languages: Most ergative languages are only morphologically ergative, split ergative or partially ergative, whereas most accusative languages are not eg. split accusative or partially accusative.
Grammatical roles v grammatical relations:

\( S \) : Single argument of a simple intransitive.*

\( A \) : The agent-like (primary) argument of a transitive action verb like “hit.”

\( P \) : The more patient-like (secondary) argument of such a transitive verb.

**Pivotal category** is a category restricted to \( S \)-agreement. (Dixon defined “subject” as an \( S = A \) pivot, which might be called the “deep subject”. Our usage is similar to LFG’s).

**Pivot** is an item with a pivotal category.

*Most of this terminology is due to Dixon (1979, 1994), eg. “pivot”, \( S \) and \( A \). We use \( P \) rather than O that Dixon suggested, following Palmer (1994).
**Morphological Ergativity**: Same case for $S$ and $P$.

Arnaq  yurar-tuq
woman-ABS dance-IND.3SG

$s$
‘The woman dances.’

Yup’ik

Angutem  tangrr-aa  arnaq
man-ERG see-IND.3SG.3SG woman-ABS

$p$
‘The man sees the woman.’

*The examples of this section are from the sources cited in Bozsahin and Steedman (2005), unless stated otherwise.*
**Morphological accusativity**: Same case for $s$ and $a$:

*Kadın*   *dans ediyor*

woman.NOM dance do-AOR.3SG

$s$

‘The woman dances.’ Turkish

*Adam*   *kadın-ı*   *gör-dü*

man.NOM woman-ACC see-PAST.3SG

$a$   $p$

‘The man saw the woman.’
Syntactic ergativity is operation of $S$ and $P$ alignment in syntax ($S=P$):

$[bayi burrbula baŋgul gubi-ŋgu bara-n] \quad [\_ baji-gu]$

I.ABS.TH B.ABS I.ERG.TH doctor-ERG punch-NFUT fall.down-PURP

$P \quad A \quad S$

‘The doctor punched Burrbula$_i$ and $\_i$ fell down.’

Dyirbal
**Mixed ergativity** is presence of both an ergative system and a non-ergative one:

\[
\text{m}^{33} \text{ka}^{55} \text{m}^{33} \text{ko}^{44} \text{ndu}^{21}
\]

Muga Mugo beat

‘Muga beats Mugo’ or ‘Mugo beats Muga’

Liangshan Nuosu (superscripts represent tones)

L.Nuosu has no case (ergative split along resultative verbs v others).

Disambiguating syntactic contexts provide alternative interpretations:

*Muga beat Mugo and ran away*: accusative interpretation (Muga runs away)

*Muga was beaten by Mugo and cried*: ergative interpretation (Muga cries)
Partial ergativity: some syntactic constructions follow the ergative pattern, but not all:

\[
\text{nanuq} \quad \text{Piita-}p \quad \text{tugu} \quad \text{-ta-a}
\]
\[
polar.bear.ABS \quad P-\text{ERG} \quad \text{kill} \quad -\text{TR.PART-3SG}
\]

‘A polar bear killed by Piita.’

‘A polar bear that Piita killed’

\[
\text{miiraq} \quad \text{kamat} \quad \text{-tu-q}
\]
\[
\text{child.ABS} \quad \text{angry} \quad -\text{REL.INTR-SG}
\]

‘The child that is angry.’

\[
\text{*angut} \quad \text{aallaat} \quad \text{tigu-sima} \quad \text{-sa-a}
\]
\[
\text{man.ABS} \quad \text{gun.ABS} \quad \text{take-PRF} \quad -\text{REL.TR-3SG.SG}
\]

*‘the man who took the gun’

Manning (1996:99) claims that, In Inuit, any argument can be omitted under coordination (ie., no pivot).
Split ergativity: Morphology of lexical classes might differ (pronouns vs. nouns in Dyirbal):

\[
\begin{align*}
\text{nana} & \quad \text{banaga-nyu} \\
\text{we.PL.NOM} & \quad \text{return-NFUT} \\
\text{‘We returned.’}
\end{align*}
\]

\[
\begin{align*}
\text{nyurra} & \quad \text{nana-na} \quad \text{bura-n} \\
\text{you.PL.NOM} & \quad \text{we.PL-ACC} \quad \text{see-NFUT} \\
\text{‘You all saw us.’}
\end{align*}
\]

\[
\begin{align*}
\text{nana} & \quad \text{nyurra-na} \quad \text{bura-n} \\
\text{we.PL.NOM} & \quad \text{you.PL-ACC} \quad \text{see-NFUT} \\
\text{‘We saw you all.’}
\end{align*}
\]

\[
\begin{align*}
\text{nyurra} & \quad \text{nana-na} \quad \text{bura-n} \quad \text{banaga-nyu} \\
\text{[you.PL.NOM} & \quad \text{we.PL-ACC} \quad \text{see-NFUT]} \quad \text{[return-NFUT]} \\
\text{‘You all saw us and (we) returned.’}
\end{align*}
\]
Lexicalising the mapping between strings and LF

In CCG, the category of a free-order transitive action verb is as in (11a), while the category of an intransitive verb is as in (11b):

(11)a. \( S\{ |NP_A, NP_P \} \)

b. \( S\{ |NP_S \} \)

The grammatical roles \( S, A \) and \( P \) are descriptive labels, to be replaced by realisation of these roles by grammatical case.
The syntactic type \( | \mathbf{NP}_s \) stands for the NP bearing the grammatical case of the single argument of the intransitive: ‘\( \mathbf{NP} \)’ for English, ‘\( \mathbf{NP}_{\text{nom}} \)’ for Turkish, ‘\( \mathbf{NP}_c \)’ for Icelandic, where c can be any morphological case.

NB. There is no notion of ‘abstract case’ in the theory, but the fact that an NP cannot both be an argument and \textbf{not} have a slash seems to be functionally equivalent to the condition that all NPs must bear case.

Ergativity and accusativity can be modeled as different ways of organising the alignment of \( s \) with an argument of the transitive verb (if any):
simple transitive: \[ S \{ |NP_p, |NP_a \} \]

simple intransitive: \[ S \{ |NP_s \} \]
Lexical categories for verbs in an ergative system:

a. $S|NP_{p}: \lambda x.\text{pred}'x$

b. $S\{NP_{A}, NP_{p}\}: \lambda \{x_1, x_2\}.\text{pred'}x_2x_1$

Lexical categories for verbs in an accusative system:

c. $S|NP_{A}: \lambda x.\text{pred}'x$

d. $S\{NP_{A}, NP_{p}\}: \lambda \{x_1, x_2\}.\text{pred'}x_2x_1$
These are actually lexical schemas, to be instantiated by grammatical case and directionality.

For example, the Japanese/Turkish accusative lexicon comes out as in (13a–b) whereas the Basque/Inuit ergative lexicon comes out as in (13c–d):*

\[
\begin{align*}
(13)a. \quad & S \backslash \text{NP}_{\text{nom}}: \lambda x.pred' x \\
& b. \quad S\{\backslash \text{NP}_{\text{nom}}, \backslash \text{NP}_{\text{acc}}\}: \lambda \{x_1, x_2\}.pred' x_2x_1 \\
& c. \quad S \backslash \text{NP}_{\text{abs}}: \lambda x.pred' x \\
& d. \quad S\{\backslash \text{NP}_{\text{erg}}, \backslash \text{NP}_{\text{abs}}\}: \lambda \{x_1, x_2\}.pred' x_2x_1
\end{align*}
\]

*Thus, empirically verifiable morphological ergativity sets the verbal categories as ergative, not whether the syntax of the language is *analysed* as ergative.
We can similarly define SVO, OVS, VSO and VOS variety of accusative and ergative languages.

VP constituency that is associated with VSO languages such as Welsh is evident in the LF: V and O form an LF constituent in

```
  1
 / \
predicate 2
```

NB. CCG does not correlate configurationality of languages with presence or absence of VP nodes; all languages have a VP type, ie. \( S|NP \), where the residual NP is the subject. (Non)configurationality is thus an outcome of lexically-specifiable but rather limited directional liberties the languages can exploit or ignore.
Using OpenCCG’s type system
to model ergativity

Bozsahin, Kruijff, and White (2005) describe OpenCCG in detail. This section covers some material specific to parameterising the grammar specifications.

You need Java SDK 1.5

Use CVS version of OpenCCG:

cvs -d:pserver:anonymous@cvs.sf.net:/cvsroot/openccg login
cvs -d:pserver:anonymous@cvs.sf.net:/cvsroot/openccg checkout openccg

mini-basque, mini-inuit etc. under grammars directory are small grammars with worked out examples.
Building CCG grammars in OpenCCG
The following parameter file specifies the basic skeleton of verbal categories in an ergative language:
<language name="Dyirbal" type="erg">

<parameters>

<infinitive subject-type="syntactic"/>

<iv>
  <predicate syn-type="s"/>
  <arg>
    <s-argument dir="\" syn-type="np" case="abs"/>
  </arg>
</iv>

<tv>
  <predicate syn-type="s"/>
  <setarg>
    <a-argument dir="\" syn-type="np"/>
    <p-argument dir="\" syn-type="np"/>
  </setarg>
</tv>

</parameters>
</language>
We obtain verbal categories such as the following for ‘see’ and ‘return’ (more detailed output shows syntactic features and LF)

tccg> buran  
1 parse found.

Parse: s{\np\np}  
-------------
(lex) buran :- s{\np\np}

tccg> banaganyu  
2 parses found.

Parse 1: s\np  
---------------
(lex) banaganyu :- s\np

Parse 2: s  
---------------
(lex) banaganyu :- s\np
(gram) pd: s\np => s  
(pd) banaganyu :- s
OpenCCG’s basic types (aka. sorts) can model accusative and ergative case marking patterns, independent of language-particular case realisation:

```
<types>
  <type name="s-case" parents="subject-case"/>
  <type name="subject-case"/>
  <type parents="a-case" name="erg"/>
  <type name="a-case"/>
  <type parents="s-case p-case" name="abs"/>
  <type name="p-case" parents="subject-case"/>
</types>
```
An ‘accusative’ types file:

```
<types>
  <type name="s-case" parents="subject-case"/>
  <type name="subject-case"/>
  <type parents="a-case s-case" name="nom"/>
  <type name="a-case" parents="subject-case"/>
  <type parents="p-case" name="acc"/>
  <type name="p-case"/>
</types>
```

All grammatical cases can be localised in types.xml, so that the grammar only refers to non-leaf labels above cross-linguistically.
Which would be generated from the following parameters file:

```xml
<language name="English" type="acc">
  <parameters>
    <infinitive subject-type="syntactic"/>
    <iv>
      <predicate syn-type="s"/>
      <arg>
        <s-argument dir="\" syn-type="np" case="nom"/>
      </arg>
    </iv>
    <tv>
      <predicate syn-type="s"/>
      <arg>
        <a-argument dir="\" syn-type="np"/>
        <p-argument dir="/" syn-type="np"/>
      </arg>
    </tv>
  </parameters>
</language>
```
<family closed="true" pos="V" name="unergative">
   <entry name="primary">
      <complexcat>
         <atomcat type="s">
            <fs id="0">
               <feat attr="index">
                  <lf>
                     <nomvar name="E"/>
                  </lf>
               </feat>
            </fs>
         </atomcat><slash dir="\"/>
         <atomcat type="np">
            <fs id="1">
               <feat attr="case" val="s-case"/>
               <feat attr="index">
                  <lf>
                     <nomvar name="X1"/>
                  </lf>
               </feat>
            </fs>
         </atomcat>
      </complexcat>
   </entry>
</family>
<lf>
<satop nomvar="E">
  <prop name="[*DEFAULT*]"/>
  <diamond mode="Arg1">
    <nomvar name="X1"/>
  </diamond>
  <diamond mode="Arg2">
    <nom name="one"/>
  </diamond>
</satop>
</lf>
</complexcat>
</entry>
</family>
Degrees of ergativity and strictly lexicalised grammars

Although syntactically ergative languages such as Dyirbal seem to apply the same restrictions to all constructions (more on this later), this is a rarity.

Most ergative languages are like Inuit, in the sense that at least some constructions escape the ergative pattern.

In other words, lexical heads of syntactic constructions have access to all and only the surface-syntactic categories to regulate the syntactic behaviour of their arguments.

Thus, syntactic/partial/mixed ergativity is a question of what heads (acting as pivots or non-pivots) impose syntactically.

Split/morphological ergativity is a matter of the lexicon-morphology.
Bozsahin and Steedman (2005) claim that the limited diversity around ergativity is due to systematic capture of the verbal categories and eg. infinitivals in the languages’ lexicons.

Currently, the systematicity is captured with the aid of parameters, which are part of the theory (ie. they are not switches in the mind/brain etc.)

Which means, the value space of the parameters ought to be explained by a theory of the lexicon, to eliminate them from the theory.

The bias towards accusative languages involves interaction of global factors shaping the lexical categories of argument-taking elements, including at least topic-prominence, subject-prominence and agent-prominence.
A strictly lexicalised grammar attributes all degrees of ergativity to the lexicon.

The syntactic behaviour of bounded and unbounded constructions is regulated by their heads (cf. the Principle of Lexical Head Government).

The heads are lexical items; they can adopt an asymmetric behaviour or ignore it.

If adopted, the lexical head of a syntactic dependency has one option: choose $s$ as pivot (syntactic processes depend only on the syntactic type).

It has two options for lexical properties such as control: choose $s$ or 1.

These limited degrees of freedom—we claim—can capture the apparent diversity of languages, and different kinds of ergativity.
(14) The Principle of Lexicalised Asymmetry:

Syntactic asymmetries are mediated by $S$, and semantic asymmetries are mediated by 1, as determined by the syntactic or semantic type of the lexical category of the head of the construction.

PLA requires that the syntactic type of $S$ and the semantic type of 1 be discernible in the category of the lexical item.*

This is possible in a purely lexicalised grammar, and it significantly constrains the notion of “possible categories” in the lexicon.

*PLA might be derivable from simpler considerations—as one reviewer noted, such as ineffability; all verbs have an $S$, no matter what their LF is, and all verbs have a 1, no matter what their syntactic type is. Other restrictions would exclude a certain lexical subclass of verbs. Eg. for unergatives, control might be imaginable but syntactically impossible if eg. 2-argument can regulate control.
Full ergativity: Dyirbal syntax.

Both bounded and unbounded constructions follow the ergative pattern, i.e., the $S = P$ relation is singled out as the pivot.

The lexical category for -$\eta u$ acts as a pivot for relativization.

\[
\begin{align*}
\text{bayi} & \quad \text{yara} & \quad [\text{miyanda}] & \quad \text{-$\eta u$} & \quad \text{yanu} \\
\text{I.ABS.TH} & \quad \text{man.ABS} & \quad \text{laugh} & \quad \text{-REL} & \quad \text{go.NFUT} \\
\text{NP}_a/\text{NP}_a & \quad \text{NP}_a & \quad \text{S}/\text{NP}_a & \quad (\text{NP}^{\uparrow}/\text{NP}_a)(\text{S}/\text{NP}_a) & \quad \text{S}/\text{NP}_a \\
\text{NP}_a & \quad \text{NP}^{\uparrow}/\text{NP}_a & \quad \text{NP}_a^{\uparrow} & \quad \text{S}/(\text{S}/\text{NP}) & \quad \text{S} \\
\end{align*}
\]

‘The man who was laughing went.’
‘The man who was laughing saw the woman.’
Sensitivity to $s = \varphi$ is evident in relativising non-absolutive arguments: the same head is involved, which requires an antipassive before a relative marker:

\[
\begin{align*}
\text{bayi yara} & \quad \text{jilwal} \quad \text{-}\eta a \quad \text{-}\nuu \quad \text{guda-gu} \quad \text{yanu} \\
\text{man.ABS} & \quad \text{kick} \quad \text{ANTIP} \quad \text{REL} \quad \text{dog-DAT} \quad \text{go.NFUT} \\
\text{NP}_a & \quad \text{S}\{\text{NP}_e, \text{NP}_a\} \quad \text{(S}\text{NP}_a) \quad \text{TV} \quad \text{(NP}_a^\uparrow\text{NP}_a) \quad \text{(S}\text{NP}_a) \quad \text{(S}\text{NP}_a) \quad \text{(S}\text{NP}_a) \quad \text{S}\text{NP}_a \\
\text{S}\text{NP}_a & \quad \text{NP}_a^\downarrow \text{NP}_a \\
\text{NP}_a^\downarrow \text{NP}_a & \quad \text{NP}_a^\uparrow \text{NP}_a \\
\text{NP}_a^\uparrow \text{NP}_a & \quad \text{NP}_a^\downarrow \text{NP}_a < \\
\text{NP}_a^\downarrow \text{NP}_a & \quad \text{S}/(\text{NP}_a) \\
\text{S}/(\text{NP}_a) & \quad \text{B} \\
\text{S} & \quad :\text{and}'(\text{antip}'(\text{kickdog'}\text{man'}))(\text{go'}\text{man'}) \\
\end{align*}
\]

‘The man who kicked the dog went.’

NB. The heads of relativisation and antipassive are lexical items, with full interpretation and a syntactic type.
Antipassive: Traditionally considered to be the ergative equivalent of passive (non-subject complement becomes subject, subject becomes oblique; NB. loss of transitivity marking below).

(15)a. *Na’e kai-i ’a e ika ’e he tamasi’i.*  
PAST eat-TRANS ABS DEF fish ERG the boy  
‘The boy ate the fish.’  

(15)b. *Na’e kai ’a e tamasi’i ’i he ika.*  
PAST eat ABS DEF boy OBL the fish  
‘The boy ate some of the fish.’

Tongan is VSO and ergative (Otsuka, 2000). Hence common association of ergativity with SOV languages is only a tendency; word order seems to be orthogonal to ergativity/accusativity of verbal categories.
And, according to Postal (1977), antipassive also manifests itself in accusative languages (e.g. French).

In a strictly lexicalised grammar, linking passives with accusativity and antipassives with ergativity is unnecessary, as both can be conceived as applying to the lexical category of transitive verbs across the lexicon and doing the same thing, be it ergative or accusative.
**Coordination**: Dyirbal lacks overt conjunctions.

Topic chains in Dyirbal suggest a pivotal conjunction category; \( \text{NP}_{\text{abs}} \) can be the topic in a chain of clauses (Dixon, 1972, p.67):

\[
\begin{array}{cccccccc}
\text{bayi} & \text{burrbula} & [\text{bangul} & \text{gubi-ŋu} & \text{bara-n}] & [\text{baji-gu}] \\
\text{I.ABS.TH} & \text{B.ABS} & \text{I.ERG.TH} & \text{gubi-ERG} & \text{punch-NFUT} & \text{fall.down-PURP} \\
S/(S\backslash\text{NP}_a) & S\$/S\backslash\text{NP}_e & S\{}\backslash\text{NP}_e, \backslash\text{NP}_a\} & S\\backslash\text{NP}_a \\
& & & S\\backslash\text{NP}_a & \& \\
& & & S : \text{and}'(punch' \text{burrbula}' \text{gubi}') (\text{falldown}' \text{burrbula}') \\
& & & \text{‘The gubi punched Burrbula, and (he) fell down.’}
\end{array}
\]

NB. Same-case condition for ATB exceptions hold.
The man went and the woman saw him.

‘The man went and the woman saw him.’
An $\text{NP}_{\text{erg}}$ cannot act as the topic in a topic chain, and this follows from the category of conjunctions and type-dependent coordination:

\begin{equation}
\begin{array}{c}
\text{bangul} \quad \text{gubi-ŋgu} \\
\text{I.ERG.TH} \quad \text{gubi-ERG} \\
\hline
\text{S}/(\text{S}\backslash \text{NP}_e)
\end{array}
\begin{array}{c}
\text{bayi} \quad \text{burrbula} \\
\text{I.ABS.TH} \quad \text{B.ABS} \\
\hline
\text{S}$$/$(\text{S}$\backslash$\text{NP}_a)$
\end{array}
\begin{array}{c}
\text{bara-n} \\
\text{punch-NFUT} \\
\hline
\text{S}\{\text{NP}_e, \text{NP}_a\}
\end{array}
\begin{array}{c}
\text{baji-gu} \\
\text{fall.down-PURP} \\
\hline
\text{S}\backslash \text{NP}_a
\end{array}
\end{equation}

$\ast$ for ‘The gubi$_j$ punched Burrbula$_i$ and (he$_j$) fell down.’

\begin{equation}
\begin{array}{c}
\text{S}\backslash \text{NP}_e
\end{array}
\end{equation}

$\ast$In principle, left-node raising of ergative NPs to share across all conjuncts should be possible with an additional non-pivotal conjunction category, but we do not know whether this includes fronting of the ergative NP in Dyirbal to become a topic.
Dyirbal is syntactically (fully) ergative because heads of all constructions appear to adopt the asymmetry, which, for syntactic constructions, can only be an $s$-based asymmetry, by the Principle of Lexicalised Asymmetry (PLA).
**Full ergativity**: Dyirbal control.

Dyirbal seems unable to control the role of non-finite complements (but note the purpose clause glosses for the controlled clause); antipassive has to apply for it to be controlled:

\[
\begin{align*}
\text{bayi yara} & \quad \text{walŋgarra} & \quad [\text{bural} & \quad -\eta-ygu & \quad \text{bagun yibi-gu}] \\
\text{I.ABS.TH man.ABS} & \quad \text{want-NFUT} & \quad \text{see} & \quad -\text{ANTIP-PURP} & \quad \text{II.DAT.TH woman-DAT} \\
\text{NP}_a & \quad \text{S\{NP}_a, |(S_{\text{inf}}|NP}_a\}} & \quad \text{S\{NP}_e, \text{NP}_a\}} & \quad \text{IV|TV} & \quad \text{IV|IV} \\
\text{S\{NP}_a & \quad \text{S\{NP}_a} & \quad \text{S\{NP}_a} & \quad \text{S\{NP}_a} & \quad \text{S\{NP}_a} \quad < \\
\text{IV|IV} & \quad \text{IV|TV} & \quad \text{IV|IV} & \quad \text{IV|IV} & \quad < \\
\text{S\{NP}_a & \quad \text{S\{NP}_a} & \quad \text{S\{NP}_a} & \quad \text{S\{NP}_a} \quad > \\
\text{S : want'\text{antip}'(see woman' (\text{ana' man'}))man'} & \quad \text{The man wanted to see the woman.}'
\end{align*}
\]
and \( \mathcal{P} \) can be controlled; the control verb takes as argument an infinitival VP in which the residual NP is not necessarily the agent NP but the syntactic subject.

(17)a.  \( \text{walngarra} := S \{ \text{NP}_{\text{abs}}, (S_{\text{inf}} | \text{NP}_{\text{abs}}) \} : \lambda \{ x_1, P \}. \text{want}' (P(\text{ana}' x_1)) x_1 \)

b.  \( \text{giga} := S \{ \text{NP}_{\text{erg}}, (S_{\text{inf}} | \text{NP}_{\text{abs}}), \text{NP}_{\text{abs}} \} : \lambda \{ x_1, P, x_2 \}. \text{tell}' (P(\text{ana}' x_2)) x_2 x_1 \)

\[
\begin{array}{c}
\text{bayi yara} \\
\text{I.ABS.TH man.ABS}
\end{array}
\begin{array}{c}
\text{walngarra} \\
\text{want-NFUT}
\end{array}
\begin{array}{c}
[\text{ŋaba-ygu}] \\
\text{bathe-PURP}
\end{array}
\]

\[
\begin{array}{c}
\text{NP}_{\text{a}} \\
S \{ \text{NP}_{\text{a}}, (S_{\text{inf}} | \text{NP}_{\text{a}}) \}
\end{array}
\begin{array}{c}
S \{ \text{NP}_{\text{a}} \}
\end{array}
\begin{array}{c}
S \text{NP}_{\text{a}}
\end{array}
\]

\[
\begin{array}{c}
S \text{NP}_{\text{a}}
\end{array}
\begin{array}{c}
S : \text{want}'(\text{bathe}'(\text{and man}')\text{man}')
\end{array}
\begin{array}{c}
'\text{The man wanted to bathe.}'
\end{array}
\]

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‘The man wanted the woman to see him.’

NB. Although the English gloss does not correspond to control, this is an instance of control in Dyirbal, because ‘man’ is a semantic argument of both clauses and necessarily missing from the subordinate clause.
This is in sharp contrast to all accusative languages, which seem always to be able to control 1, and to other ergative languages, which can also control 1s.

Eg., Previous example is ruled out in English; non-subject NPs (/NP) do not align with 1.

*John persuaded him
NP   (S\NP)/(S_{inf}\NP)/NP   NP
(S\NP)/(S_{inf}\NP) > (S\NP)/(S_{inf}\NP)
(S\NP)/(S_{inf}\NP)

[Sue see]
NP   (S\NP)/NP
(S\NP)/NP > T
S/(S\NP)
S/NP > B
S/NP

--------------------------------*

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Manning (1996) attributes Dyirbal’s apparent lack of \( A \)-control to such constructions being chains of clauses, therefore a syntactic construction, rather than being a lexical property of the verb as in control, which would explain their strict \( S = P \) sensitivity.

But clause chaining in Dyirbal is restricted to \( \text{NP}_{\text{abs}} \) as Dixon (1972:67) noted.
(18b) should be problematic under clause-chaining account:

(18)a. \( yabu \quad \etauma-\etagu \quad giga-n \quad [\text{banaga-ygu}] \)

mother.ABS father-ERG tell-NFUT return-PURP

‘Father told mother [to return].’

b. \( \etauma-\etagu \quad yabu \quad giga-n \quad [\text{banaga-ygu}] \)

father-ERG mother.ABS tell-NFUT return-PURP

‘Father told mother [to return].’
Thus, Dyirbal’s infinitival VP category differs from that of other ergative languages, and from accusative languages, in a way that can be predicted by PLA:

- Dyirbal inf. VP: $S_{\text{inf}} \backslash \text{NP}_{\text{abs}}: \lambda x. \cdots x \cdots$
- Inuit inf. VP: $S_{\text{inf}} \backslash \text{NP}_{\text{abs}}: \lambda x. \cdots x$
- English inf. VP: $S_{\text{inf}} \backslash \text{NP}: \lambda x. \cdots x \cdots$
- Turkish inf. VP: $S_{\text{inf}} \backslash \text{NP}_{\text{nom}}: \lambda x. \cdots x \cdots$

Since infinitivalisation is a lexical process, PLA applies to the lexical category of its head, hence it can have a 1-asymmetry or $S$-asymmetry.

In case of accusative languages, 1 aligns with $S$ and $\mathcal{A}$, thus reading control off LF or syntactic type is the same (i.e. $x$ above is always 1 for English and Turkish), but it must be enforced in Inuit, Basque, Tagalog and many others if Dyirbal is not the only exception to universality of 1-control.
Lexicalising the VPinf category suggests the possibility of having no control in a language.

Mayali (Evans, 1991), Mohawk (Baker, 1996) and Nunggubuyu (Heath, 1975) seem to have no control.

Baker (1996) shows convincingly that languages that lack infinitival clauses are likely to have no control. This is not a necessity but a strong tendency.

It is not a necessity because, assuming the conventional definition of an infinitival clause for the moment in that they lack syntactic subjects, lack of infinitivals means no $s$-control in our terminology, but 1-control would still be possible as in ergative languages that exhibit accusative patterns in control.
**Partial ergativity:** Inuit control.

\[ A \text{ and } s \text{ can be controlled, but not } s ; P \text{ below can only be of type } \lambda x. \cdots x \]

(19a. \textit{niriursui} := \textit{S\{NP}_{abs}, \textit{VP}_{inf}\}} : \lambda \{x_1, P\}. \textit{promise'} (P(ana' x_1))x_1

\[ \begin{array}{cccc}
\text{Miiqqat} & \text{Juuna} & \text{ikiu-ssa-llu-gu} & \text{niriursui-pp-u-t} \\
\text{children.ABS} & \text{J.ABS} & \text{help-FUT-INF-3SG} & \text{promise-IND-INTR-3PL} \\
\text{NP}_a & \text{NP}_a & \text{S\{NP}_e, \text{NP}_a\}} & \text{S\{NP}_a, \text{VP}_{inf}\}} \\
\text{S\{NP}_e & \text{S\{NP}_a} & \text{S:promise'} (\text{help' juuna'} (ana' children'))children'} \\
\text{S:promise'} (\text{help' juuna'} (ana' children'))children'} & \text{S:promise'} (\text{help' juuna'} (ana' children'))children'} \end{array} \]

‘The children promised to help Juuna.’
Miiqqat
children.ABS
dance-FUT-INF-4PL
promise-IND-INTR-3PL

NP_a

S\NP_a

S{\NP_a, \VP_{inf}}

S\NP_a

S: promise′(dance′(ana′children'))children′

‘The children promised to dance.’
**Partial ergativity**: Inuit syntax.

Some syntactic constructions follow the ergative pattern, i.e. the $s = p$ relation is singled out as the pivot, but not all.

Relative markers are pivots:

\[
\begin{align*}
(20)a. & \quad nanuq & \quad [Piita-p & \quad tugu] & \quad -ta-a \\
\text{polar.bear.ABS} & \quad P-ERG & \quad \text{kill} & \quad \text{-TR.PART-3SG} \\
\hline
\text{NP}_a & \quad \text{NP}_e & \quad S\{ \text{NP}_e, \text{NP}_a \} & \quad (\text{NP}^{\uparrow}\text{NP}_a)\backslash (S\text{NP}_a) \\
\hline
\text{NP}^{\uparrow}\text{NP}_a & \quad \lambda Q.\text{and}'(\text{kill}'p\text{bear}'\text{piita}')(Qp\text{bear}') \\
\hline
\end{align*}
\]

‘A polar bear killed by Piita.’
‘A polar bear that Piita killed’
b.  

\[
\begin{align*}
\text{miiraq} & \quad [\text{kamat}] & \quad -\text{tu-q} \\
\text{child.ABS} & \quad \text{angry} & \quad -\text{REL.INTR-SG} \\
\underline{NP_a} & \quad S\backslash\underline{NP_a} & \quad (NP\uparrow\underline{NP_a})\backslash(S\backslash\underline{NP_a}) \\
\quad & \quad \underline{NP\uparrow\backslash NP_a} \quad \text{<} \\
\quad & \quad \underline{NP\uparrow: \lambda Q. \text{and}'(angry' \text{child}') (Q \text{child}')} \quad \text{<} \\
\end{align*}
\]

'The child that is angry.'

c.  

\[
\begin{align*}
\text{*angut} & \quad [\text{aallaat} & \quad \text{tigu-sima}] & \quad -\text{sa-a} \\
\text{man.ABS} & \quad \text{gun.ABS} & \quad \text{take-PRF} & \quad -\text{REL.TR-3SG.SG} \\
\underline{NP_a} & \quad \underline{NP_a} & \quad S\{\backslash NP_e, \backslash NP_a\} & \quad (NP\uparrow\backslash NP_a)\backslash(S\backslash\underline{NP_a}) \\
\quad & \quad S\backslash\underline{NP_e} \quad \text{<} \\
\quad & \quad \text{<} \\
\quad & \quad \text{***} \quad \text{<} \\
\end{align*}
\]

*‘the man who took the gun’
Non-pivotal coordination: Fortescue (1984:131) reports that, in contemporative mood (ie. true coordination), two absolutive NPs share across conjuncts if they are both $P$ or $S$, but not $S = P$ (NB. passive morphology on the second conjunct, therefore a missing NPabs):

\[ \text{Hansi} [\text{isir-puq}] S \backslash \text{NP}_\text{abs} \quad [\text{Kaala-mil } =lu \text{ taku-niqar-luni}] S \backslash \text{NP}_\text{abs} \]

H come-in.3S.INDIC K-ABL and see-PASSIVE-4S.CONT

‘Hansi came in and was seen by Kaala.’

\[ \text{‘Hansi [came in]} S \backslash \text{NP}_\text{abs} \quad \text{and [Kaala saw (him)]} S \backslash \text{NP}_\text{abs} \]

would be grammatical only in non-contemporative moods (ie. non-coordinating subordination).
Inuit is partially ergative because not all constructions follow the ergative pattern, but some do. In Basque, no construction follows the ergative pattern (no head adopts the asymmetry although verbal categories are ergative).
Morphological ergativity: Basque syntax and control.

Basque’s control is similar to Inuit’s; only 1s can be controlled (as in accusative languages, cf. Anderson 1976).

Unlike accusative languages, the $s$ and $a$ arguments corresponding to 1 do not bear the same case in Basque.

And, unlike Inuit, unbounded dependencies engendered by heads of coordinations and relativisation do not seem to arise from asymmetric syntactic types.

This is a possibility predicted by the Principle of Lexical Head Government and the Principle of Lexicalised Asymmetry: heads are free to adopt or ignore the asymmetry as lexical items, independent of other heads’ behaviour.
The same relative marker, \(-n\), is used to relativise all arguments of a verb; the marker has a non-pivotal category:

\[
\begin{align*}
(21) \text{a.} & \quad \text{emakume-}a-\text{ri} & \text{liburu-}a & \text{eman} & \text{dio} & \text{gizon} & \text{-a} \\
\text{woman-the-DAT} & \text{book-the} & \text{give} & \text{has} & \text{-REL} & \text{man} & \text{-the} \\
\text{NP}_d & \text{NP}_a & \text{S}\{\text{NP}_e, \text{NP}_a, \text{NP}_d\} & \text{S}\{\text{NP}_\tau\}\text{S}\{\text{NP}_\tau\} & \text{N/}\text{N} & \text{N} & \text{NP}_\uparrow\text{N} \\
\text{S}\{\text{NP}_e, \text{NP}_d\} & \text{S}\{\text{NP}_e\} & \text{N/}\text{N} & \text{N} & \text{NP}_\uparrow \\
\text{S}\{\text{NP}_e\} & \text{N/}\text{N} & \text{N} & \text{NP}_\uparrow \\
\text{N/} & \text{N} & \text{N} & \text{NP}_\uparrow
\end{align*}
\]

‘The man who has given the book to the woman’
b. *gizon-a k liburu-a eman dio* -n emakume -a

> \[
\text{NP}_e \quad \text{NP}_a \quad S\{\text{NP}_e, \text{NP}_a, \text{NP}_d\} \quad (S\text{NP}_\tau) (S\text{NP}_\tau) \quad (N/N) (S\text{NP}) \quad \text{N} \quad \text{NP} \uparrow \text{N}
\]

\[
\text{S}\{\text{NP}_e, \text{NP}_d\} <
\]

\[
\text{S}'\text{NP}_d <
\]

\[
\text{S}'\text{NP}_d <
\]

\[
\text{N}/\text{N} <
\]

\[
\text{N} <
\]

\[
\text{NP} \uparrow <
\]

'The woman to whom the man has given the book'
Gizon-a-k emakume-a-ri liburu-a eman dio.
man-the-ERG woman-the-DAT book-the.ABS give has
‘The man has given the book to the woman.’

Comrie (1989:141–2)

emakume-a-ri liburu-a eman dio-n gizon-a
woman-the-DAT book-the give has-REL man-the
‘The man who has given the book to the woman’

gizona-k emakume-a-ri eman dio-n liburu-a
man-the-ERG woman-the-DAT give has-REL book-the
‘The book which the man has given to the woman’

gizon-a-k liburu-a eman dio-n emakume-a
man-the-ERG book-the give has-REL woman-the
‘The woman to whom the man has given the book’
Basque coordination without pivots: Example below is considered an instance of conjunction reduction by Manning (1996).

\[ Ama-k \quad \textit{seme-a eskola-n utzi (zuen)} \quad \textit{eta klase-ra joan (zen)} \]

mother-ERG son-ABS school-at leave AUX.3SG.3SG and class-to go AUX.3SG

‘Mother left her son at school and went to class.’
It is not only the $S$ and the $A$ NP, but the $P$ NPs (22a) and $S$ and $P$ NPs can be co-indexed under coordination as well (22b–c).

(22) a. *Sagarrak emakumeak egosten ditu* eta *gizonak jaten ditu*
    Apples-ABS woman-ERG cook AUX.3SG.3PL and man-ERG eat AUX.3SG.3PL
    ‘The woman cooks and the man eats apples.’ Alan King (p.c.)

b. *Sagarrak emakumeak egosten ditu* eta *usteltzen dira*
    Apples-ABS woman-ERG cook AUX.3SG.3PL and rot AUX.3PL
    ‘The woman cooks apples and they rot.’

c. *Sagarrak usteltzen dira* eta *emakumeak egosten ditu*
    Apples-ABS rot AUX.3PL and woman-ERG cook AUX.3SG.3PL
    ‘Apples rot and the woman cooks them.’
The choice of auxiliaries in (22b–c) show that any syntactic argument can be deleted in Basque, and the auxiliaries provide a constrained way of identifying them.

That can be made explicit in the conjunction’s category: it will be

\[(S \setminus \text{NP}_\alpha) \times (S \setminus \text{NP}_\alpha) \setminus (S \setminus \text{NP}_\beta)\]

to take care of case and agreement under coordination.

This is a non-pivotal category (\(\alpha\) and \(\beta\) are not restricted to a combination of \(S\), \(A\) and \(P\)).

There seems to be no head in the Basque lexicon with a pivotal category, which would explain Basque’s “apparent” ergativity.
**Split ergativity**: Dyirbal’s pronouns.

\[ nana \quad banaga-nyu \]  
we.PL.NOM return-NFUT  
‘We returned.’

\[ nyurra \quad nana-na \quad bura-n \]  
you.PL.NOM we.PL-ACC see-NFUT  
‘You all saw us.’

\[ nana \quad nyurra-na \quad bura-n \]  
we.PL.NOM you.PL-ACC see-NFUT  
‘We saw you all.’

\[ nyurra \quad nana-na \quad bura-n \quad banaga-nyu \]  
[you.PL.NOM we.PL-ACC see-NFUT] [return-NFUT]  
‘You all saw us and (we) returned.’
The operation of Dyirbal’s split morphology might suggest an ergative system for nominals, and an accusative system for pronominals.

The accusative system corresponds to 1 binding of the nominative pronoun (23a–b) and 2 binding of the accusative pronoun (23c), as in accusative languages.

(23)a. \( nyurra := S/VP: \lambda P.P \text{you}' \)

b. \( nana := S/VP: \lambda P.P \text{we}' \)

c. \( nana-na := VP/TV = (S\{NP_{erg}\})/(S\{NP_{erg}, NP_{abs}\}) : \lambda \{y,P\}.P \text{us}'y \)
Dyirbal’s split behaviour in morphology can be accounted for by the lexical categories of the pronominals, without a need for another set of verbal categories for case marking and binding of pronominal arguments (i.e. its verbal categories are all ergative).

Dyirbal can be characterised as a split ergative language with fully ergative syntax.
**Mixed ergativity**: Liangshan Nuosu (see Gerner 2004).

The $P AV$ order is ergative, and $AVA$ order is accusative in Nuosu.

Gerner claims $P/A$ identity in $P AV$ & $PV$ coordination (his ex.37)

This involves a pivot because $P$ in the first conjunct is part of $S = P$; as the word-order in the first conjunct suggests, it is an ergative clause

If Nuosu can only delete clause-initial positions as Gerner claims, then the second conjunct is an accusative clause due to the ordering $[A]PV$ (with subject relation $S = A$).

This is merely an ergative subject in an ergative clause co-referring with an accusative subject in an accusative clause, that is, a pivot.
Skewness in the ergative-accusative language spectrum

There are clearly global factors that bias languages towards some orders rather than others.

Earliness in the sentence seems to correlate with various kinds of prominence, including topic- or focus- prominence, agent or 1-prominence, and subject or $s$-prominence.

Languages that are extremely Topic/Focus-prominent, such as the Slavic languages, are thereby committed to some degree of order-freedom at the syntactic and semantic levels.
(The labels S and O below are closer to typological tradition, similar to 1 and 2 of CCG):

For accusative languages, in which the nominative subject and the topic usually coincide, the SO orders (SOV, SVO, VSO) maximise 1-prominence, s-prominence, and topic-prominence,

While the OS orders (OSV, OVS, VOS) minimise all three.

Since the accusative languages appear to considerably outnumber the ergative, this fact alone may explain the preponderance of SO orders among configurational languages in general, as Manning (1996:22) has suggested.
For ergative languages however, SO orders maximise only 1-prominence, minimising $s$-prominence.

Since the absolutive $s$ in ergative languages is often claimed to coincide with topic in much the same sense as nominative does in accusative languages (Mallinson and Blake 1981, 103-115, 155-158):

SO orders may also minimise Topic-prominence as well.

On the other hand, while OS orders minimise 1-prominence, they maximise $s$-prominence, and by implication Topic-prominence.

One might therefore expect the ergative languages to split across SO and OS linearization, depending on whether they favor 1-prominence over $s$/Topic-prominence.
Case and Agreement: Icelandic case

As syntactic information, case and agreement can only be part of the syntactic type of a lexical item.

By the Principle of Lexical Head Government, the syntactic type of the head should enforce agreement, regardless of the (un)boundedness of the construction it heads:

The man who likes/*like chocolate

The man who I think that you claimed likes/*like chocolate

The embedded verb projects, and the relative pronoun enforces, agreement.

Similarly, case must be regulated by the syntactic type of the head.
The Icelandic challenge (for the theory) is that the notion of subject seems to be seriously dissociated from morphological case; subjects are leftward-looking functors independent of their case (Icelandic is considered to be SVO, and subjects can be nominative, accusative, dative or genitive).

And, agreement seems to be dissociated from nominative case and directionality of the NP (ie. from its CCG equivalent of “structural” case):

- dative subjects do not agree with the verb, but nominative subjects do.
- accusative subjects agree, just like nominative subjects.
Stelpunum brá við.

the-girls (DAT-FEM-PL) startled (SG)

‘The girls were astonished.’ (Andrews, 1990, p.189–190)

Ég tel strákana (hafa verið) kitlaða.

I believe the-boys (ACC-MASC-PL) (to have been) tickled (ACC-MASC-PL)

‘I believe the boys to have been tickled.’

This is a possibility envisaged (though not explained) by CCG: directionality of an argument is orthogonal to its syntactic features, and both are lexically discernible.
Thus, if a verb takes an infinitival VP, ie. $S_{\text{inf}} \backslash \text{NP}$, it can ignore morphological case and agreement of the residual NP, in the residue $S_{\text{inf}} \backslash \text{NP}_{\text{Case,Agr}}$, although that NP is LF-coindexed with the subject of the matrix verb. (there is no threading of syntactic and semantic features via co-indexation as in HPSG).

\textit{Stelpan/*Stelpuna} \ [\textit{vonast til}] \ (S \backslash \text{NP}_{\text{nom}} / (S_{\text{inf}} \backslash \text{NP}) \ [\textit{að vanta ekki efni í ritgerðina}] S \backslash \text{NP}_{\text{acc}}

\text{the-girl-NOM/*ACC hopes toward to lack not material in the-paper}

‘the girl hopes to not lack material for the paper.’

$S$: \textit{hope'}(\textit{not'}\textit{lack'}\textit{material'}(\textit{ana'}\textit{girl'}))\textit{girl'}
**Icelandic control.**

All cases can be controlled in Icelandic, but only if they are also syntactic subjects in the above sense: the leftward NP (cf. Zaenen et al. 1990, p.106; Andrews 1990, p.198 ).

a. *Stelpuna vantar efni í ritgerðina*  
   the-girl-ACC lacks material in the-paper  
   ‘The girl lacks material for the paper.’

b. *Stelpan/*Stelpuna vonast til að vanta ekki efni í ritgerðina*  
   the-girl-NOM/*ACC hopes toward to lack not material in the-paper  
   ‘the girl hopes to not lack material for the paper.’

*cf. Maling and Zaenen 1990 for extensive discussion of its syntax, and Bozsahin and Steedman 2005 for a CCG formulation of some aspects of coordination in Icelandic.*
Thus the category of the verb *vantar* ‘lacks’ is as in (25a), rather than (25b):

(25) a. \(\text{vantar} := (S \backslash \text{NP}_{\text{acc},3\text{sing}}) / \text{NP}_{\text{nom}}\)  
b. \(\text{lacks} := (S \backslash \text{NP}_{\text{nom},3\text{sing}}) / \text{NP}_{\text{acc}}\)  

And the category of *vonast* (til) ‘hopes (for)’ is

\(\text{vonast} := (S \backslash \text{NP}_{\text{nom}}) / (S_{\text{inf}} \backslash \text{NP}) : \lambda P\lambda x.\text{hope}'(P (\text{ana}'x)) x\)

\[
\begin{array}{c}
\text{Stelpan/*Stelpuna} \\
\text{the-girl-NOM/*ACC} \\
\text{NP}_{\text{nom}} \\
\hline
\text{vonast til} \\
\text{hopes toward} \\
(S \backslash \text{NP}_{\text{nom}}) / (S_{\text{inf}} \backslash \text{NP}) \\
\text{NP}_{\text{nom}} \\
\hline
\text{[að vanta ekki eðni í ritgerðina]} \\
to lack not material in the-paper \\
S_{\text{inf}} \backslash \text{NP}_{\text{acc}} \\
\text{S}_{\text{inf}} \backslash \text{NP}_{\text{acc}} > \\
\text{S}_{\text{nom}} \backslash \text{NP}_{\text{nom}} < \\
\text{S: hope'}(\text{not}'\text{lack}'\text{material'}(\text{ana}'\text{girl'}))\text{girl}'
\end{array}
\]
The matrix verb has the option of 1) ignoring case and agreement coming from the residue and imposing its own requirement as in the control verb above, or 2) adopting them.

The second option might be the Inuit strategy, rather than the verb incorporation analysis of Bok-Bennema (1991:169):

\[Hansi\ [sinik] S_{NP_{nom}} \textit{-kuma-vuq}\]

H-NOM sleep -want-IND.3SG(INTR)

‘Hansi wants to sleep.’ (Bok-Bennema, ibid:222)

\[Hansi-p\ [qajaq \ atur] S_{NP_{gen}} \textit{-uma-vaa}\]

H-GEN kayak-NOM borrow -want-IND.3SG.3SG(TR)

‘Hansi wants to borrow the kayak.’

Bok-Bennema’s -GEN and -NOM can be glossed as -ERG and -ABS.
NB. embedded verb is incorporated in both examples.

Unlike Basque, the case of control verb’s subject appears to depend on the transitivity of the controlled verb.

\[
\text{Nik} \quad [\text{joan}]_{S\backslash \text{NP}_{\text{abs}}} \text{ nahi dut}
\]
I-ERG go.INF want have.1SG.3SG
‘I want to go.’

\[
\text{Nik} \quad [\text{kafea} \quad \text{egi}]_{S\backslash \text{NP}_{\text{erg}}} \text{ nahi dut}
\]
I-ERG coffee-ABS do.INF want have.1SG.3SG
‘I want to make coffee.’

The matrix verb cannot impose its own requirements on the embedded verb, this category violates Projection Principles (Principles of Inheritance and Lexical Head Government), and it is not formulable in a strictly lexicalised grammar with no record of derivations.
Thus, morphological case, structural case and agreement can diverge or converge, because, as syntactic information embodied in a lexical syntactic type, the choice is up to the head of the construction.

The only locus for their origin is the lexical syntactic type of argument-taking entities, eg. verbal categories, to be projected by a completely transparent and monostratal universal combinatory syntax (the ‘syntactic projector’).

In a lexicalised domain of locality, the possibilities for the heads are predictable, and not unlimited;

and they seem to have been attested cross-linguistically.
Summary

CCG attempts to provide

1) a framework (or toolbox) to explicitly formulate hypotheses in the form of syntactic-semantic type pairings,

2) a theory (of grammar-lexicon) to narrow down the notion of “possible lexical category”, therefore possible grammars,

3) ... and a somewhat user-friendly computational environment to unleash the ‘syntactic projector’ and hypotheses on real data.