Distributive Operators in Distributive Numerals: Zimmermann 2002

1. The Basic Empirical and Analytic Claims and Questions

(1) **Key Proposals of Zimmermann (2002a,b)**

a. Distributivity *From* Distributive Numerals

- Distributive numerals (*aka* 'Anti-Quantifiers', 'Distance Distributives') – specifically, the 'binominal each' construction of English and the *Jeweils* constructions of German – actually *syntactically contain* the distributive operators they are understood to contribute.

- Nevertheless, (with the help of a few special composition rules), we can derive the semantics of these constructions from something very close to their surface syntax.

b. Cross-Linguistic Variation w.r.t. 'Pluractional Readings'

- Pluractional readings (*aka* 'event-distributive readings', 'event-related readings') of sentences containing distributive numerals are derived by allowing the understood restrictor of the distributive operator go unbound
  - o This allows the restrictor to be construed as a contextually salient plural event.

- The absence of such pluractional readings for binominal each in English (and related constructions) is due to certain formal properties of the distributive numerals in those languages
  - o These properties conspire to prevent the distributive restrictor from being unbound, and thus from being construed as a plural event…

(2) **The Phenomena of Central Interest: English 'Binominal Each'; German *Jeweils***

- The sentences below are more-or-less synonymous.

- Their chief difference rests in the ability for (adnominal) '*jeweils drei*' to in some sentences allow a pluractional reading akin to 'three at a time' or 'in threes'.

  - o Note: such a pluractional reading may actually be absent from (2b).

a. The boys bought [three sausages **each**]

b.

Die	Jungen	kauften	[	**jeweils**	drie	Würstchen	].
the	boys	bought		**DIST**	three	sausages	

(3) **Characteristic Properties of the Constructions in (2) [According to Zimmermann]**

a. The expression bearing the special marker (*each, jeweils*) must be indefinite.

(i) * The boys tried [those sausages **each**]
(*cf*. The bought **eacb** tried those sausages.)

Note: Actually, the generalization that the marked expression must be indefinite is too weak. Rather, as we've seen before, it's usually the case that only a restricted set of cardinality predicates can be so-marked.

(ii) * The boys bought [a sausage **each**]
(iii) The boys bought [one sausage **each**]

(iv) ? The boys bought [a few sausages **each**]
(v) * The boys bought [many sausages **each**]

b. The expression bearing the marker must be a clausemate with the understood restrictor of the distributive operator (the so-called 'Distributive Key')

(i) * The store clerks said that Peter bought [one balloon **each**]
(*cf.* The store clerks **each** said that Peter bought one balloon.)

(4) **Terminology: 'Anti-Quantifier'** Construction bearing properties above.

(5) **Anti-Quantifiers in Other Languages**
Zimmermann (2002a,b) lists a great many; I've excerpted a few below.

a. Icelandic: Strakarnir keyptu [tvaer pylsur **hvor]**.
boys.the bought two sausages **each.DUAL**

b. Italian: I ragazzi comprarano [un libro **ciascuno**]
the.boys bought one book **each**

c. Russian: Mal'chiki kupili [**po** dve sosiski **kazhdyj]**
boys bought **P** two sausages **each**

d. Korean: Aituli phwungsen-hana-**ssik**-ul saessta
kids balloon-one-**DIST**-ACC bought

e. Japanese: Otokotatiga **sorezore** huta-ri-no zyosei-o aisi teiru koto
men **each** two-CL-GEN women-ACC love

Notes:
- The dual number on the distributive particle in (4a) seems significant!
- According to Gil (1982), the particle *kazhdyj* isn't really necessary in (4c).
- Unlike Gil (1982), Zimmermann seeks a unified analysis of (2) and (4)

(6) **First Key Analytic Puzzle: 'The Compositionality Problem'**

- In many of the Anti-Quantifier (AQ) constructions, the marker of the AQ appears independently to be a distributive operator in the language (*e.g.* English 'each')

- It's not implausible, then, to suppose that the AQ marker is itself the distributive operator that these constructions are interpreted as contributing to the sentence.

  - In languages where the AQ marker is not homophonous with an independent DIST operator, there is simply some kind of contextual allomorphy going on.

- However, *if* the AQ marker *is* a distributive operator, it seems to be surfacing in a different position from where it's interpreted in.

  - Rather than being sister to its *restrictor* as it usually is (6a), it seems to be sister to a *subpart* of its *scope* (6b).

a. <u>*Each* as a Distributive Operator:</u>

(i) *Sentence:* [**Each** of [<u>the boys</u>]] [brought one dish to the party]

(ii) *Meaning:* ∀z. z < <u>the.boys</u> & AT(z) → z brought one dish to the party

b. <u>*Each* as an Anti-Quantifier</u>

(i) *Sentence:* [the boys] [brought [<u>one dish</u> **each**] to the party]

(ii) *Meaning:* ∀z. z < the.boys & AT(z) → z brought <u>one dish</u> to the party

c. **Key Question:** Can we derive the T-conditions in (6bii) without distorting too terribly the surface structure in (6bi)?

(7) **Second Key Analytic Puzzle: 'The Cross-Linguistic Problem'**

- In many languages, AQ constructions allow for 'pluractional' or 'event distributive' readings, where the understood restrictor of the *DIST* operator is a plural event (7a).

- But, in many other languages, such interpretations are not possible (7b).

a. <u>German *Jeweils*:</u>

[**Jeweils**	ein	Apfel]	war	verrottet.
DIST	one	apple	was	roten

One apple was rotten each time / in each basket.

b. <u>English *Each*:</u> * [One apple **each**] was rotten.

c. **Key Question**: What is the source of this cross-linguistic variation?

2. The Internal Syntax and Semantics of Anti-Quantifiers

(8) First Key Assumption: Pronominal Restrictor for AQ-Marker

- As stated above (6), the AQ-marker (*each* in 'binominal each') is a distributive operator.

a. <u>The Semantics of *Each* in 'Binominal Each'</u>

$[\![\textit{each}]\!]^g \quad = \quad [\ \lambda x_e : [\ \lambda P_{et} : \forall z.\ z < x\ \&\ AT(z) \rightarrow P(z)\ ]\ ]$

- However, in an Anti-Quantifier, this distributive operator combines with a (possible covert) pronominal.

- This pronominal is (usually) bound by the understood restrictor of the distributive operator.

b. <u>The Syntax of Binominal Each, Part 1</u>

[[The boys]$_1$ [bought [… one sausage … [**each pro$_1$**] …]

- While the pronominal restrictor of the AQ-marker *each* is null in English, in other languages, it may have an overt realization.

c. <u>Possible Realizations of AQ Restrictor</u>

(i) *German:* je-**weil**-s
(ii) *Italian:* ciasc-**uno**

(9) Second Key Assumption: Marked Expression in AQ is Type <et>

- The expression marked in the 'Anti-Quantifier' construction is an <et> predicate.

a. <u>The Syntax of Binominal Each, Part 2</u>

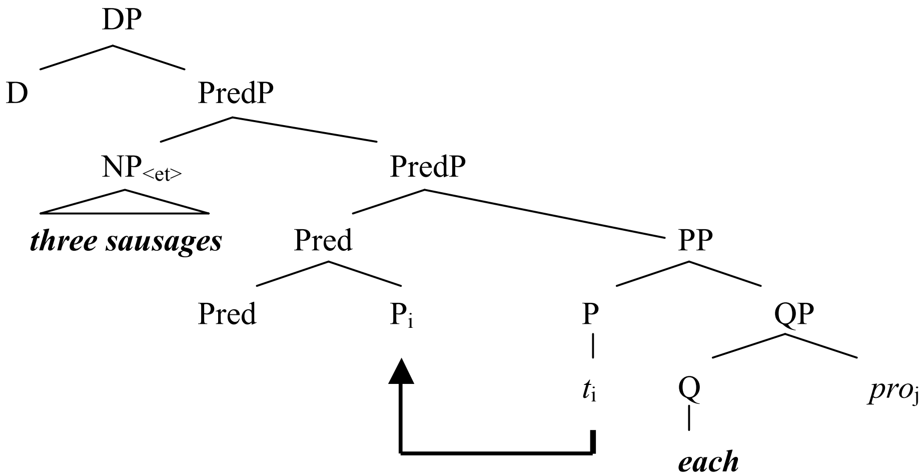
[[The boys]$_1$ [bought [… one sausage$_{<et>}$ … [**each pro$_1$**] …]

<u>Problem:</u> As we already noted, the condition in (9) is too weak, as it will also allow structures like the following:

* **[[The boys]$_1$** [bought [… sausages$_{<et>}$ … [**each pro$_1$**] …]

(10) **Third Key Assumption: The Internal Syntax of the Anti-Quantifier**

The internal syntax of the Anti-Quantifier is as illustrated below:



- The whole Anti-Quantifier is a DP headed by a (special) null D
- CompDP is a PredP headed by a null Pred head.
- SpecPredP is the numeral expression marked by the AQ-marker
- CompPredP is a PP headed by a (special) null P
- This null P undergoes head movement to the Pred-head.
- CompPP is the QP headed by the AQ-marker (*each*); CompQP is the (possible null) pronominal restrictor of the AQ-marker.

a. Some Notes About The Component Parts

(i) The postulated P head may have overt reflexes in some languages:

1. *German* je-weil-**s** (genitive case)
2. *Russian* **po** dve sosiski kazhdyj (*po* = preposition)

- However, the *po* seems not to be in the position expected by (10)

(ii) In order to derive the surface word-order in the German *jeweils* construction, we must assume some fronting of the PP to Spec DP

$[_{DP}$ $[_{PP}$ t_i $[_{QP}$ **je weils** $]$ $]_2$ $[_{DP}$ D $[_{PredP}$ $[_{NP}$ drie Würstchen $]$ $[_{PredP}$ Pred+P_i t_2 $]$ … $]$

(11) **Fourth Key Assumption: The Semantics of the Preposition Head**

- The preposition P is a variable over two-place relations.
- It is necessarily co-indexed with and bound by some other expression in the sentence denoting a two-place relation.

[**The boys**]$_1$ [**bought**$_2$ [$_{DP}$ D [$_{PredP}$ [$_{NP}$ **three sausages**] [$_{PredP}$ Pred+P$_2$ [$_{PP}$ t_2 [$_{QP}$ **each** *pro*$_1$]…]

(12) **Fifth Key Assumption: The Semantics of the Complex 'Pred+P' Head**

We assume a special rule for interpreting the complex 'Pred+P' head above:

$[\![\text{ Pred P}_i\ ]\!]^g \quad = \quad [\ \lambda Q_{<et,t>} : [\ \lambda P_{et} : [\ \lambda f_{ee} : Q\ (\ [\ \lambda x_e : P(f(x))\ \&\ g(i)(f(x))(x)\ ]\ )\ ]\ ]\ ]$

Under this semantics, [[Pred+P]] is a function that takes as argument:

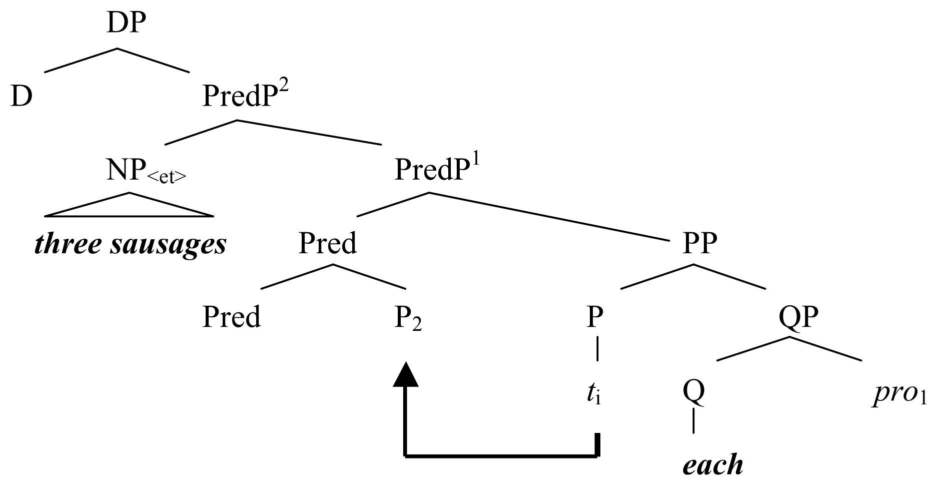
- A *generalized quantifier Q*
  - This will be the denotation of the QP headed by *each*
- An *<et>-predicate P*
  - This will be the denotation of the indefinite marked by the AQ marker
- A function *f* from entities to entities (a 'Skolem Function')
  - This will ultimately serve the function of introducing the understood existential quantification over the *<et>* predicate P.

(13) **Sixth Key Assumption: The Semantics of the Null D Head**

The special null D head in the Anti-Quantifier introduces existential quantification over the <ee> (Skolem) function *f*.

$[\![\text{ D }]\!] = \quad [\ \lambda F_{<ee,t>} : \exists f\,.\ F(f)\ ]$

(14) **Putting the Pieces Together**



a. $[[\text{PP}]]^g = [[\text{QP}]]^g = [\ \lambda P_{et} : \forall z.\ z < g(1)\ \&\ \text{AT}(z) \rightarrow P(z)\ ]\ ]$

b. $[[\ \text{Pred P}_2\ ]]^g = [\ \lambda Q : [\ \lambda P : [\ \lambda f : Q\ (\ [\ \lambda x_e : P(f(x))\ \&\ g(2)(f(x))(x)\ ]\ )\ ]\ ]\ ]$

c. $[[\ \text{PredP}^1\ ]]^g = [\ \lambda P : [\ \lambda f : \forall z.\ z < g(1)\ \&\ \text{AT}(z) \rightarrow P(f(z))\ \&\ g(2)(f(z))(z)\ ]\ ]$

d. $[[\ \text{PredP}^2\ ]]^g = [\ \lambda f : \forall z.\ z < g(1)\ \&\ \text{AT}(z) \rightarrow \text{three.sausages}(f(z))\ \&\ g(2)(f(z))(z)\ ]$

e. $[[\ \text{D}\ ]]^g = [\ \lambda F_{<ee,t>} : \exists f.\ F(f)\ ]$

f. $\mathbf{[[\ DP\ ]]^g = \exists f.\ \forall z.\ z < g(1)\ \&\ AT(z) \rightarrow three.sausages(f(z))\ \&\ g(2)(f(z))(z)}$

- As shown above, the entire Anti-Quantifier *three sausages each* is of *type t* (!?)
- This DP is true iff
  there is an <ee> function *f* such that
  for all atomic sub-parts z of *g*(1),
  f(z) is a triplet of sausages, and
  z and *f*(z) bear the relation *g*(2) to each other.

(15) **Key Observation**
As shown in (15b), we can obtain the T-conditions of sentence (15a) if we set *g*(1) = *the.boys*, and *g*(2) = *buying*.

a. The boys bought three sausages each.

b. $\exists f.\ \forall z.\ z < \textbf{the.boys}\ \&\ \text{AT}(z) \rightarrow \text{three.sausages}(f(z))\ \&\ \textbf{z bought}\ f(z)$
(where f = [λx : the sausages that x bought])

Thus, to complete the picture, we need a story of how (14) can compose with the rest of the sentence and achieve the effect in (15).

3. The External Syntax and Semantics of Anti-Quantifiers

(16) **Question**

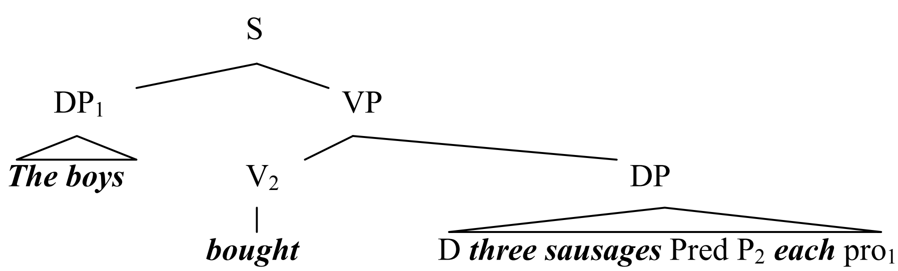
- According to the semantics in the preceding section, an Anti-Quantifier like *three sausages each* is of **type t** (14)
- *How on earth, then, does it semantically compose with the rest of the sentence?*

(17) **Special Rule: Index-Triggered Lambda Abstraction (ITLA)**

If X bears the index *i* or its sister bears the index *i*, then $[[X]]^{g}$ *can* (but need not) be:
$[\ \lambda x : [[\ X\ ]]^{g(i/x)}\ ]$.

- Recall the discussion and use of this rule by Lin (1998)

(18) **Truth-Conditional Derivation for Sentence (15a)**



(i) $[[$ *three sausages each* $]]^{g}$ = (by ITLA)

$[\ \lambda R : [[$ *three sausages each* $]]^{g(2/R)}\ ]$ = (by (14))

$[\ \lambda R : \exists f\ .\ \forall z.\ z < g(1)\ \&\ AT(z) \rightarrow \text{three.sausages}(f(z))\ \&\ R(f(z))(z)]$

(ii) $[[\ VP\ ]]^{g}$ = (by ITLA)

$[\ \lambda x : [[VP]]^{g(1/x)}\ ]$ = (by FA)

$[\ \lambda x : [\ \lambda R : \exists f\ .\ \forall z.\ z < x\ \&\ AT(z) \rightarrow \text{3.sausages}(f(z))\ \&\ R(f(z))(z)]([[\text{buy}]])$ =

$[\ \lambda x : \exists f\ .\ \forall z.\ z < x\ \&\ AT(z) \rightarrow \text{3.sausages}(f(z))\ \&\ z \text{ bought } f(z)\ ]$

(iii) $[[\ S\ ]]^{g}$ = (by FA)

$[\ \lambda x : \exists f\ .\ \forall z.\ z < x\ \&\ AT(z) \rightarrow \text{3.sausages}(f(z))\ \&\ z \text{ bought } f(z)\ ](\text{the.boys})$ =

$\boldsymbol{\exists f\ .\ \forall z.\ z < \text{the.boys}\ \&\ AT(z) \rightarrow \text{3.sausages}(f(z))\ \&\ z \text{ bought } f(z)}$

(19) **Explanation for Characteristic Properties of Anti-Quantifiers, Part 1**

a. Property:
The expression bearing the AQ-marker (*each, jeweils*) must be indefinite.

(i) * The boys saw [**those sausages** each]

b. Explanation:
- This follows trivially from the semantics given for [Pred P_i] in (12)
- Note again, though, that this semantics predicts the possibility of sentences like that in (i) below.

(i) * The boys bought [**sausages** each]

(20) **Explanation for Characteristic Properties of Anti-Quantifiers, Part 2**

a. Property:
The expression bearing the AQ-marker must be a clausemate with the understood restrictor of the distributive operator (see Oh 2001, 2005)

(i) * The store clerks said that Peter bought [one balloon **each**]

b. Explanation:
- Given our compositional rules, the only way for the subordinate subject to combine semantically with the subordinate VP is for that subject to bind the restrictor of the AQ-marker (*each*)
- Thus, the restrictor of the subordinate AQ-marker *must* be the subordinate subject;
    - There's simply no way to 'bypass' the subordinate subject and allow the restrictor of the AQ-marker to be the matrix subject.

Note: The explanation in (20) is quite interestingly different from the rather promissory account offered by Oh (2001, 2005).

(21) **First Key Analytic Puzzle: 'The Compositionality Problem'**

How can we derive the T-conditions of sentences containing Anti-Quantifiers (distributive numerals) without diverging too greatly from their surface structure?

- We can posit certain null pronominals (*pro*, *P*) providing the restrictor and the scope of the AQ distributive marker *internal to the AQ itself*.

- The rule of ITLA allows us to bind those pronouns, and thereby provide their values from other expressions in the sentence.

4. The Derivation of Pluractional / Event-Distributive Readings

(22) **Second Key Analytic Puzzle: 'The Cross-Linguistic Problem'**

How do we derive the 'pluractional' or 'event distributive' reading for sentences like (22a)? Why is such a reading not possible for parallel English sentences like (22b)?

a. German *Jeweils*: [**Jeweils** ein Apfel] war verrottet.
DIST one apple was roten
One apple was rotten each time / in each basket.

b. English *Each*: * [One apple **each**] was rotten.

(23) **Another New Semantic Rule: Type-Triggered Lambda Abstraction (TTLA)**

If X and Y are sisters, and (i) $[[X]]^g$ is of type *t*, and (ii) $[[X]]^g$ is not in the domain of $[[Y]]^g$, and (iii) X contains a free variable pro_i , and (iv) $[[pro_i]]^g$ is of the same type as $[[Y]]^g$, then $[[X]]^g$ *can* (but need not) be: $[\lambda x : [[X]]^{g(i/x)}]$.

(24) **New Semantic Assumption: Event Arguments and Their Type**

- In order to capture the event-distributive reading, we will need to explicitly represent the event argument that we've been ignoring until now.

- Crucial Note:
In order for everything to work out, we *must* assume that events are no different in type from entities: that is, we do not have a separate type (ε) for events. Consequently:
  - *Transitive Verbs* are now of type <eeet>.
  - *Intransitive Verbs* are of type <eet>.

  Note: As the reader can confirm for themselves, if we *don't* assume that events are also of type *e*, then we will need to introduce massive type ambiguity in the AQ markers (*each, jeweils*), the null pronominals and the complex [Pr P] head.

(25) **Important Note: Revision of Our Semantics for [Pred P]**
Given the addition of the event argument, we need to slightly adjust our semantics for the complex [Pred P_i] head.[1]

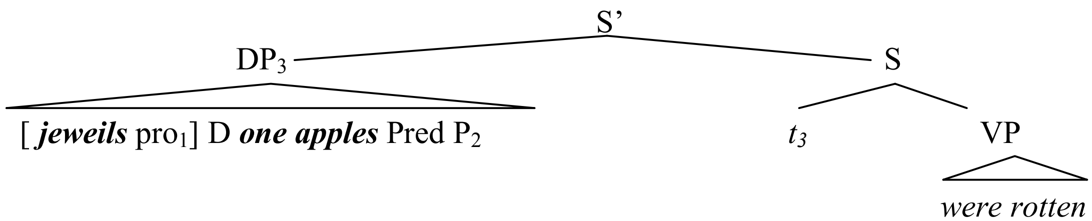
$$[[\text{Pred } P_i]]^g = [\lambda Q_{<et,t>} : [\lambda P_{et} : [\lambda f_{ee} : \exists \mathbf{e}.\ Q ([\lambda x_e : P(f(x)) \ \&\ g(i)(f(x))(x)(\mathbf{e})])]]]$$

Note, though, that we will still make use of the semantics in (12) in the derivation below.

[1] In his dissertation, Zimmermann avoids this by allowing existential closure over the event argument to optionally occur at the level of the V-head itself. When this occurs, the V-head is of type <eet>, as desired.

(26) **Truth Conditional Derivation for (22a)**

- To derive the pluractional reading of (22a), we assume that the subject *jeweils ein Apfel* undergoes short movement to S.



(i) $[[S]]^g$ = (by ITLA)
$[\ \lambda x : [[\ t_3 \textit{ were rotten }]]^{g(3/x)}\ ]$ =
$[\ \lambda x : \lambda e : \text{x is rotten in e}\ ]$

(ii) $[[\ DP_3\ ]]^g$ = (by TTLA)
$[\ \lambda R : [[\textit{ jeweils one apple }]]^{g(2/R)}\ ]$ = (by (14))
$[\ \lambda R : \exists f\ .\ \forall z.\ z < g(1)\ \&\ AT(z) \rightarrow \text{one.apple}(f(z))\ \&\ R(f(z))(z)]$

(iii) $[[\ S'\ ]]^g$ = (by FA)
$[\ \lambda R : \exists f\ .\ \forall z.\ z < g(1)\ \&\ AT(z) \rightarrow \text{one.apple}(f(z))\ \&\ R(f(z))(z)]$
$([\ \lambda x : \lambda e : \text{x is rotten in e}\ ])$ =

$\boldsymbol{\exists f\ .\ \forall z.\ z < g(1)\ \&\ AT(z) \rightarrow \text{one.apple}(f(z))\ \&\ f(z) \text{ is rotten in } z}$

There exists a function f *from entities (events) to entities such that for all atomic members z of g(1),* f(*z*) is one apple, and f(*z*) *is rotten in z.*

- Note that given these T-conditions, it follows that the atomic entities *z* must be *events*
- Thus, the plurality *g*(1) is a plurality of events.
- Thus, these T-conditions amount to:
  There exists a plurality of events e, and every atomic subevent e' in e is such that there is one apple that is rotten in e.

(27) **Summary of the Analysis**
In order to derive the event distributive / pluractional reading, we raise the AQ to a high position, where it scopes over the remainder of the clause. This allows:

a. The restrictor pronominal *pro* to remain unbound, and thus be construed as referring to some (salient) plural event.

b. The sister of the AQ to be a relation between entities and events. Thus, we can have it supply the value of the null P head via TTLA.

(28) **Question:**

Why is a derivation like that above not possible for the English sentence in (22b)?

(29) **Observation 1: AQ Markers and Adnominal Quantifiers**

- In the languages that do not allow for 'event distributive' / 'pluractional' readings of sentences containing AQs, the AQ-marker is formally identical to an adnominal distributive marker.

a. The boys bought [three sausages **each**]
b. [**Each** boy] bought three sausages.

- In the languages that *do* allow for 'event distributive' / 'pluractional' readings, the AQ-marker is *not* formally identical to an adnominal distributive marker.

a.	Die	Jungen	kauften	[**jeweils**	drie	Würstchen	].
	the	boys	bought	**DIST**	three	sausages	

b.	* [**Jeweils**	Jungen]	kauften	drie	Würstchen
	DIST	boys	bought	three	sausages

(30) **Observation 2: Events as Distributive Restrictors**

- Even languages which – like English – disallow 'event distributive' / 'pluractional' readings, the understood restrictor of an Anti-Quantifier *can in principle* be an event, *just so long as that (plural) event is denoted by a DP*.

a. Those **parties** cost [$5000 **each**]

(31) **Conclusion:**

- The facts in (30) show that the impossibility of 'event distributive' / 'pluractional' readings in languages like English cannot be due to a *semantic* constraint on the understood restriction of the AQ marker.

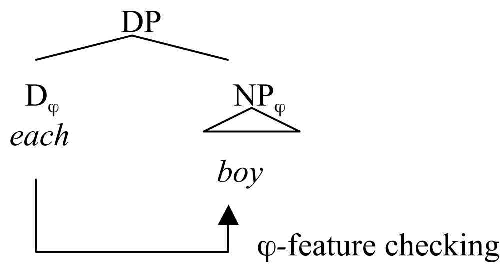
- Rather, it must be due to some *syntactic* restriction, likely related to the fact in (29).

(32) **The Analysis: Obligatory Phi-Features in the AQ-Marker**

a. In languages where the AQ-marker is also an adnominal quantifier, the AQ-marker bears uninterpretable φ-features.

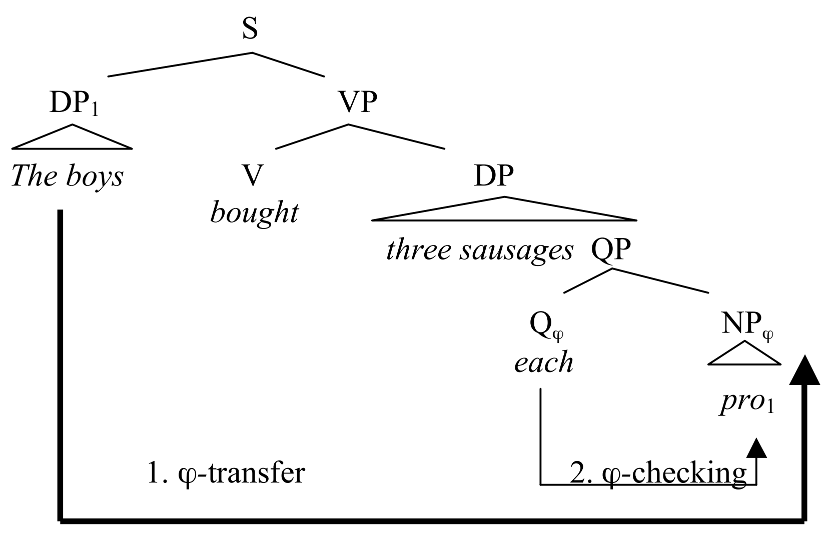
- Presumably, it bears these φ-features as a *result* of its being adnominal.

b. In sentences where the AQ-marker is adnominal, it checks these uninterpretable φ-features off from its NP complement.



c. In sentences where the AQ-marker is in an Anti-Quantifier, it checks these φ-features off from its (null) pronominal complement.

d. However, *qua* pronoun, the complement of the AQ-marker in the Anti-Quantifier only receives its φ-features through co-indexation with a higher DP bearing those φ-features.



e. Therefore, if the pronominal restrictor of the AQ marker were ever left unbound – as in (26) – it would not have any φ-features. Consequently:

- The AQ marker would not be able to check off its uninterpretable φ-features
- The derivation will crash (syntactically)

5. Summary and Some Follow-Up Questions

(33) **Key Proposals of Zimmermann (2002a,b)**

a. Distributivity *From* Distributive Numerals

- Distributive numerals (*aka* 'Anti-Quantifiers', 'Distance Distributives') *syntactically contain* the distributive operators they are understood to contribute.

- Nevertheless, we can derive the semantics of these constructions from something very close to their surface syntax.

  - We posit certain null pronominals (*pro*, *P*) providing the restrictor and the scope of the distributive marker *internal to the AQ itself*.

  - The special composition rule of ITLA allows other overt expressions in the sentence to *bind* those pronouns, thereby providing their values.

b. Cross-Linguistic Variation w.r.t. 'Pluractional Readings'

- Pluractional readings of sentences containing distributive numerals are derived by allowing the understood restrictor of the distributive operator go unbound
  - o This allows the restrictor to be construed as a contextually salient plural event.

- The absence of such pluractional readings for binominal each in English (and related constructions) is due to certain formal properties of the distributive numerals in those languages
  - o These properties conspire to prevent the distributive restrictor from being unbound, and thus from being construed as a plural event…

(34) **Follow-Up Question 1**

a. Question:
In all the examples above of AQ constructions with 'participant distributive' readings, the AQ is a direct object. How, then, do we analyze sentences like the following, where the AQ is in subject position?

[Jeweils zwei Offiziere] begleiteten die Ballerinen nach Haus.
DIST two officers accompanied the ballerinas to home
The ballerinas were each accompanied home by two officers.

b. Answer:
In his dissertation, Zimmermann shows how these can be analyzed using TTLA. Note, however, that the analysis requires covert movement of *die Ballerienen*, and so diverges from being 'surface compositional' (Zimmermann 2002: 272)

(35) **Follow-Up Question 2**

a. Question:
In the truth-conditional derivation in (26) of the 'pluractional reading', it's pretty crucial that the AQ is the highest argument in the clause.

- This high position allows the sister of the AQ to be a relation between entities and events, and so allows the null preposition P_i to be construed as such a relation.

- Note that we could not derive a comparable 'pluractional' reading from the transitive LF in (18), since the sister to the AQ is a *transitive* verb.

- How, then, are we to analyze sentences like the following in Korean, where AQs in direct object position easily allow for pluractional readings?

John-kwa	Mary-ka	kabang	sey-kay-**ssik**-lul	wunpanhaessta.
John-and	Mary-NOM	suitcase	three-CL-**DIST**-ACC	carried

John and Mary carried three suitcases each.
John and Mary carried suitcases in threes. (Oh 2001: 326)

b. Answer: In his dissertation, Zimmermann argues that it is empirically correct for German to state that an AQ allows a pluractional reading only if it is *structurally highest* in the clause.

- However, this structurally highest position *can* be derived via scrambling a lower argument higher. (Zimmermann 2002: 252)

- Thus, it is in principle possible to analyze the Korean sentences above, as long as one countenances a certain amount of covert movement (see (34b))

(36) **General Point of Criticism**

While this analysis does achieve a (largely) surface-compositional account of AQs, this simplification of their (LF) syntax comes at a high cost for the semantics:

a. The special rule of ITLA, and the special (non-compositional) rule of TTLA

b. The special stipulative lexical entry for the complex [Pr P] head. (As well as the fact that it seems we need more than one such entry.)

c. The special stipulative lexical entry for the D head of the AQ.

d. The assumption that *events* and *entities* are of the same logical type. (Or else, the wide array of type-ambiguity that is required.)