Polarity and Arbitrariness in French

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French/American Coll. on Syntax & Semantics, MIT, 7/5/98

The problem

Recent work on polarity and free choice items has promoted several (different) theoretical notions pertaining to the domains of polarity and quantification,

Non-existentiality for any (Dayal 1995, Zwarts 1995, Giannakidou 1996) and for tout (Kleiber & Martin 1977),

modal character or non-individuation for any and tout (Eisner 1994, Tovena 1996, Tovena & Jayez 1997a,b and 1998, Dayal 1998, foreshadowed in Dayal 1995), and for FC items (Giannakidou 1996, 1997),


arbitrariness (Tovena & Jayez 1997b, 1998).

Is it possible to assemble these different perspectives into a coherent picture?

Basic distinction: Free Choice (FC) and Polarity Sensitive (PS) behaviours, a familiar distinction in the literature on any.

To be examined: tout (≈FC any), le moindre (≈the least).

Three basic ideas

• Non veridicality
The idea that some constructions require that the truth of a certain proposition be not entailed by the sentence.

(1) Mary read any book which was on the topic.

(1) is felicitous because there is perhaps no book on the topic. Veridicality for FC any and tout has been attacked in (T&J:97a,b) and abandoned in (Dayal 1998). However, it proves useful for NPI (Giannakidou 1996).

• Non individuation or variation
The idea that some judgments have a modal/generic/dispositional flavour.

As such, they are not about particular individuals but rather about possible individuals. So, (1) is not about particular books on the topic but rather about a stable behaviour of Mary.

• Arbitrariness
The idea is that some judgments are about dependencies between properties. That’s why those judgments:

are about possible individuals in cases where dependencies between properties do not depend on individuation,

are independent from individual existence.

Arbitrariness leads to non-veridicality and non-individuation. Moreover, it provides a plausible connection between PS and FC behaviour.

Arbitrary objects (Fine 1985, 1988) reminiscent of Plato’s chaos, akin to the notion of informational type (description in TFS, object in OOL, concept in DL, etc.).

Connected with (i) non constant domain semantics (variation): intuitionistic logic, S4.2, relevance logic, etc., (ii) ε calculus and instantial logics (Meyer Viol 1995).

Basic idea: types survive, individuals are expendable,

(1) associated with \( \forall m : M \in C : \text{book on the topic in c } \Rightarrow \text{read } b \text{ in c}. \)

‘For every arbitrary object \( m \) of type \( M \) (Mary), \( c \) of type \( C \) (situation context of (1)) and \( b \) of type \( \text{‘book on the topic in c’} \), \( m \) read \( b \) in \( c \).’

More compact presentation: every object \( b \) of type \( \text{‘book on the topic in c of type } C \) is an object of type \( \text{‘being read by } m \text{ of type } M \text{ in } c \).’

Distinction between reference and felicity condition. (1) refers to a particular situation, but it is felicitous only if this situation is perceived as a local consequence of the dependency between arbitrary objects.

Modes of non individuation

Roughly, (simple) variation = the possibility to imagine possible individuals, in addition to the actual ones; arbitrariness = the informational side of the notion of variation: \( a \) is a possible variant of \( b \) iff \( a \) and \( b \) are indiscernible w.r.t. some (set of) property (properties). Variation is the symptom of arbitrariness.

• Variation
Vagueness), Roughly, an any phrase must not refer to a determinate set of individuals. This takes care of things like:

(2) a. ??Tout étudiant de ce groupe a réussi l’examen
??any student from this group passed the test

b. Jean a parlé à ??toute femme qui était sur le mur
John talked to ??any woman who was on the wall

• Towards arbitrariness
T&J (1997b, 1998) suggest that the relevant notion here is not that of variation but that of arbitrariness (Fine 1985). Three problems for variation based analysis,
1. How to deal with (3)?

(3) I’ensemble {1, 2, 3} contient tout nombre qui en est membre
The set {1, 2, 3} contains any number which of it is member
The set {1, 2, 3} contains any number which is a member of it

(3) is analytic and is about particular individuals,

2. How to deal with (4)

(4) Il y a 200 étudiants dans le département et tout étudiant
There are 200 students in the department and student
a reçu une convocation officielle
received a summon

Again, (4) refers to individual students.

3. Variation does not say much about the possible connection between PS and FC any.

• What is arbitrariness? As noted by different authors (Ladusaw, Eisele, Dayal, T&J, etc.), \( \phi(\text{any } N) \) with FC any conveys the impression that there is some sort of necessary link between the property denoted by N and the other properties mentioned in \( \phi \). Compare (3) and (2a) or (2b). The relevant notion here is that of indiscernibility. Two individuals \( a \) and \( b \) are indiscernible with respect to a set of properties \( P \) whenever \( a \) and \( b \) satisfy all the properties of \( P \). In (3), any number which would be indiscernible of 1, 2 or 3 w.r.t. the property of being a member of \( \{1, 2, 3\} \) would satisfy the property of being a member of the set. In (2b), suppose that in the actual world \( w \), John spoke to Sally, Mary and Sue. Let \( w' \) be a world accessible from \( w \) in which Judy is also on the wall. Judy is indiscernible from Sally, Mary and Sue w.r.t. the property of being on the wall in \( w' \). However, we have no guarantee that John spoke also to Judy in this world.

In (2a), there is no obvious link between being a student of the mentioned group and passing the test. So, the sentence is really about particular students: one may not arbitrarily imagine other students and assume that they would have passed the test as well. In contrast, in (4), while the sentence is about the students of the department, the fact that is about them is not relevant to the link between the property of being a student of the department and the property of having received a summon. Arbitrariness holds when the aboutness of a sentence does not block or weaken the link between properties.

Fine (1995) distinguishes between necessity and variation (‘non rigidity’ in his terms). A predicate is rigid whenever it is equivalent to a disjunction of identities.

(5) Fine’s rigidity
\( P \) is rigid if it equivalent to \( \lambda x, x = a_1 \lor \ldots, \lor x = a_\alpha \) for some ordinal \( \alpha \).

What (3) shows is that we may have necessity even in the case of rigid predicates. So, variation is not absolutely obligatory for tout and FC any sentences. A sentence \( \phi(\text{tout } N) \) says that \( \phi \) is true of an arbitrary object (Fine 1985) of type N. An entity is of type \( P \) \( (P \) a set of properties) whenever it satisfies all the properties of \( P \). An arbitrary object \( a \) of type \( P \) \( (P \) a set of properties) is an object such that, for any \( \phi \), if \( \phi \) is true of \( a \), it is also true of any individual of type \( P \).

(6) Arbitrary object
\( a \) is an arbitrary object of type \( P \) iff for every \( \phi \), if \( \phi(a) \), then \( \phi(a) \) for every \( a \) of type \( P \). We write \( a^P \rightarrow a^Q \) when every arbitrary object of type \( P \) is an arbitrary object of type \( Q \).

In (3) \( P \) is just the property of being 1, 2 or 3, noted \( \in \{1, 2, 3\} \). Assume that the things which satisfy this property remain the same through all worlds. If \( a^\{1, 2, 3\} \) is the arbitrary object of type \( \in \{1, 2, 3\} \), it satisfies \( \in \{1, 2, 3\} \) by definition.
1 satisfies ∈ {1, 2, 3}, so 1 satisfies ∈ {1, 2, 3} in virtue of being of type ∈ {1, 2, 3}. 1 satisfies also the property of being the ‘first’ member of {1, 2, 3} in the natural ordering of ordinals. However, 1 is not the first on the list in virtue of being on the list. 3 is on the list and is greater than 2. However 3 is not on the list in virtue of being greater than 2 (4 is greater than 2 but is not on the list).

What counts is dependency between (sets of) properties.

(7) Arbitraryness of tout
\( \phi(\text{tout } N) \) is felicitous only if we can construct an interpretation in which the situation it describes appears as a consequence of a dependency \( \bar{a}[a] \rightarrow \bar{a}[b] \)

- The subtrigging effect.
  Subtrigging = the fact that a marginal sentence is redeemed by modifying the N in any N, generally with a relative clause or a postnominal modifier. For an interpretation as in (7) to be constructed, we must access properties. This gives the intuitive flavour noted in the literature for any: \( \phi(\text{any } N) \) or \( \phi(\text{tout } N) \approx \) every \( x \) which is an N satisfies \( \phi \) in virtue of being an N, which gives rise to the variation based reading in most cases: since it is in virtue of being an N that \( \phi \), it does not matter which instance of N we consider.
  Subtrigging = a property emerges (in DRT, a special discourse reference would be introduced).\(^5\)

(8) a. J'ai reçu les étudiants, \(^7\) C', est assez fréquent
  I received the students. This is pretty frequent
b. J'ai reçu les étudiants qui étaient intéressés, C', est assez
  I received the students who were interested. This is pretty frequent

c. Tout étudiant qui a raté le premier examen (ce qui est
  Any student who missed the first exam (which is
  malheureux) a une seconde chance
  unfortunate) gets a second change

d. Tout chômeur (\(^7\) ce qui est malheureux) a une
  Any unemployed person (\(^7\) which is unfortunate) gets a

second chance
second chance

Polarity sensitivity
- Negative Polarity Items (NPIs) emerge empirically as items which fit only in certain ‘negative’ environments (standard negation, downward entailing environments and questions). More recent approaches (Kriika 1995, Israel 1996) focus on information, Israel views PSI as conveying an informative value (i-value), corresponding to the distinction between understatements and emphatic statements, and a quantitative value (q-value), corresponding to degrees on a scale. The NPS or PPS status of an item depends on the combination of values it exhibits. E.g. an [emphatic, low] item demands that the environment be negative,

(9) a. Asserting that a low value on some scale is reached is not very informative \( \Rightarrow \) the corresponding statement cannot be emphatic
  \( \Rightarrow \) the [emphatic, low] combination is not licensed by assertions
b. Mary made \(^7\) the least effort

(10) a. Denying that a low value on some scale is reached is informative, because it implicates that many values on the scale are not reached (scalar entailment à la Fauconnier)
  b. Mary didn’t make the least effort

- Some items behave externally as NPIs and as PPIs. E.g. le moindre (lit. ‘the least’) which is strikingly parallel to any.

(11) PPI behaviour
a. Marie a lu le moindre livre sur la question
  Mary read the least book on the topic
b. Tu dois lire le moindre livre sur la question
  You must read the least book on the topic
c. Lis le moindre livre sur la question
  Read the least book on the topic

(12) NPI behaviour
a. Marie n'a pas lu le moindre livre
  Mary did not read the least book
b. Marie a-t-elle lu le moindre livre?
   Did Mary read the least book?

c. Seule Marie a élevé le moindre objection
   Only Mary raised the least objection

d. Je suis content/étonné que Marie ait lu le moindre livre
   I am glad/surprised that Mary read the least book

• Moreover, subtrigging effects are similar,

(13) a. Marie a lu \( \leq \) le moindre livre
   Mary read the least book

b. Lis \( \leq \) le moindre livre
   Read the least book

• We have a very strong intuition that le moindre is scalar. So, an ideal solution would (i) capture the parallelism between le moindre and any in scalar terms, (ii) explain the subtrigging effect and (iii) take into account some differences between the two items. We can start from the idea that any has a sort of concessive value (Y, S, Lee 1993, Y, S, Lee & Horn 1994, Horn 1996, C, Lee 1996, 1997), Mary read any book on the topic can be paraphrased as 'Mary read all the books on the topic, even the least interesting, relevant, etc. We rephrase the affinity between any and even in an information-based terminology.

(14) **Expectation ordering**

Let \( S \) be a scale, that is, a total order \( (\Delta_S, \leq) \), where \( \Delta_S \) is a set of degrees \( \delta_i \). An expectation ordering (e.o.) on \( S \) with respect to some monadic predicate \( P \) is a scale \( S' \) \( \langle \{P, \delta_i\}, \leq_s \rangle \).

Intuitively, expectation ordering (e.o.) on a scale \( S \) is an ordering of the degrees of \( S \) w.r.t. some predicate. If \( \delta_i \leq \delta_j \) on this e.o., objects of degree \( \delta_i \) are not likelier to satisfy \( P \) than objects of degree \( \delta_j \). For instance, given a scale \( S \) of interest for books in a given domain, and a read predicate read, one of the possible e.o. on \( S \) w.r.t. read is defined by the isomorphism:

\[ \langle \text{read}, \delta_i \rangle \leq_s \langle \text{read}, \delta_j \rangle \text{ iff } \delta_i \leq \delta_j \]

A more interesting book is more likely to be read than a less interesting one.

(15) **Informational relevance**

Let \( S \) be a scale and \( S' \) an e.o. on \( S \) w.r.t. some predicate \( P \). The informational relevance in \( S' \) of a proposition \( P(\delta_i) \), where \( \delta_i \) is a degree of \( S \), is the set \( \{ \delta_j : \langle P, \delta_j \rangle \geq_{S'} \langle P, \delta_i \rangle \} \).

By (15), we have that a proposition \( P(\delta_i) \) is maximally relevant iff for all \( \delta_j \), \( \langle P, \delta_j \rangle \geq_{S'} \langle P, \delta_i \rangle \). The characterization of minimal relevance is similar.

• For any and le moindre we require that informational relevance be maximal with respect to some scale expectation pair. A sentence like (11a) would then mean that Mary read the book that was the least likely to be read (expectation) with respect to some criterion (scale). In contrast, (12a) would mean that Mary did not read the book that was the likeliest to be read.

(16) **Informational relevance for any and le moindre**

\( \phi(\text{any} N) \) and \( \phi(\text{le moindre} N) \) are felicitous only if we can construct an interpretation under which the corresponding propositions are maximally relevant, in the sense of (15).

Any and le moindre do not specify the orientation of the scale(s) with respect to which informational relevance is evaluated. So, they show as NPIs or as PPIs indifferently.

• How to interpret subtrigging in this new scalar framework? This is particularly important since existing approaches to any either recognize its scalar nature but fail to explain subtrigging or explain subtrigging at the cost of distinguishing PS and FC any too sharply. If subtrigging is a particular symptom of arbitrariness, linking scalarity and arbitrariness provides a solution. Maximal relevance according to (15) entails that (even) the most (least) significant degree does not satisfy (satisfies) a certain predicate. This implies that the trigger of non-satisfaction or satisfaction is not an individual object but rather the category which subsumes the object. For instance, in (11a), the fact that Mary read even the less interesting or relevant books implies that she read such books in virtue of their property of being on the topic.

However, this doesn’t work for NPI uses of any or le moindre. Some of these uses are definitely accidental in flavour.

(17) a. Marie n’a pas touché au moindre objet sur ce bureau
   Mary didn’t touch the least object on this desk

b. Mary didn’t touch any object on this desk
If uttered in detective story context, neither (17-a) nor (17-b) imply that there was a disposition of Mary or a conceptual profile of objects on the desk such that the proposition conveyed by the sentences is true. Mary just happened not to have touched any object on the desk.

- Still, there is a sense in which arbitrariness is applicable to (17-a) and (17-b). As noted by Fine (1985, 1988): arbitrariness prevents the use of enumeration. If $\alpha$ is an arbitrary object, $\phi(\alpha)$ may not be proved by enumerating all individual instances of $\alpha$ and by proving that each instance satisfies $\phi$.

The arbitrary flavour of negation and, more generally, of negative contexts consists in the fact that they assert propositions which cannot be proved by enumeration. When we say that Mary didn’t touch any object, we might have spied Mary and observed that she didn’t touch the objects. Since there is (presumably) a finite number of objects, we could enumerate them and check that Mary didn’t touch any of them. However, we cannot enumerate all the events of Mary touching one of the objects and dismiss them as non-existing. Alternatively, we cannot observe events of non-touching. So, the event-type of Mary touching one of the objects on the desk provides the arbitrary entity we need. Unifying the PS and FC cases requires that we extend the notion of arbitrariness to events.

### Arbitrary events

$e$ is an arbitrary event iff every possible instance of $e$ is realized or every possible instance of $e$ is not realized.

We tie up the PS and FC behaviours by requiring that some form of arbitrariness (on objects or events) be used in an appropriate interpretation.

### PS/FC marriage

$\phi(\text{any } N)$ and $\phi(\text{le moins })$ are felicitous only if we can construct an interpretation in which it means either $\alpha^{[n]} \rightarrow \alpha^{[0]}$ or the event $e^{[\text{any } N]}$ (or $e^{[\text{le moins } N]}$) is arbitrary.

Negative sentences like (12-a) use an arbitrary event of Mary reading a book because no possible instance of this event is realized. Positive sentences adhere to particular events $\Rightarrow$ no arbitrary event $\Rightarrow$ object based reading

### Imperatives

In Vendlerian imperatives any emerges as an ‘indefinite’.

(20) Pick any card ($\approx$ ‘Pick a card, no matter which one’)

Yet, if the ‘indefinite’ value for any is associated with PS any, interpreting any in (20) as an indefinite forces us to assume either that (i) the imperative environment hosts PSI or (ii) that the association of the ‘indefinite’ any with polarity sensitivity is not robust.

### Any and imperatives

We might assume that (20) is licensed by covert subtrigging (Pick any card you like). But the manoeuvre would make every occurrence of any acceptable (we would appeal to a covert subtrigging whenever needed).

Imperatives describe states of affairs which are considered as desirable (or necessary) by the speaker, and which are described by the propositional content of the imperative. So, they come with (at least) two e.o. The scale of the propositional content and that of the satisfaction judgments.

(21) **Expectation orderings for imperatives**

Imperative of form $1P(a)$, where $a$ is the addressee,

$E.o.$ of the p.c. = $E.o.$ of $P(a)$,

$E.o.$ of satisfaction = $E.o.$ on the possible situations of type $P(a)$ which satisfy the speaker.

For (20): $E.o.$ of the p.c. = $(\{\text{pick}(a, x), \delta_i\}, \leq)$ $E.o.$ of satisfaction = $(\{\{\text{pick}(a, x_i), \delta_1 \ldots \delta_n\}\}, \leq)$, where the $x_i$ refer to cards.

$E.o.$ of satisfaction = the ranking of the possible card picking situations.

This gives two possibilities:
a. The addressee picks the card which is the least likely to be picked. A typical case of FC any which is only possible with subtrigging or event nouns.

Information relevance (15) is satisfied by the p.c.

(22) a. Pick any card which is marked (p.c. = the addressee will pick any card which is marked)

b. Punish any misdemeanour (p.c. = the addressee will punish any misdemeanour which occurs)

b. The addressee picks the card which is the most likely to be picked. A plausible (maybe lexicalized) interpretation is that the addressee picks any
card she likes. There is no scalar entailment, the addressee is not expected to pick all cards, hence the `indefinite' value of any. However, informational relevance is not satisfied by the propositional content which entails the addressee will pick some card. It is satisfied on the e.o. of satisfaction: the situation where the addressee picks the card she likes is satisfactory, so the speaker has no special requirement on the card picking situation, so every card picking situation would be satisfactory for the speaker.

- *Le moindre* and imperatives
  *Le moindre* is not felicitous in a (20) environment.

  (23) Prends **la moindre** carte
      Pick the least card

Explanation: *le moindre* favours `natural' e.o. where the item associated with the minimal likelihood is actually small, unimportant, not substantial, boring, ugly, etc. Observe:

  (24) a. Any difficulty can be overcome
      b. **La moindre** difficulté peut être surmontée
          The least difficulty can be overcome

Conclusion

Arbitrariness contributes a more principled analysis of variation phenomena.

It provides the missing link between scalarity and quantification.

It will probably help to discriminate between genuine arbitrary items (any, tout, *le moindre*), and items which exploit variation and are conducive to arbitrariness but are not based on it (*n'importe quel*).

References


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Notes

1 A similar distinction is used by Dayal (1998) when she ascribes the oddness of certain sentences with any to a presupposition failure.

2 Giannakidou proposes that FC items are subject to a constraint of non episodicity, thereby generalizing a more local suggestion about any, to be found already in (Ladusaw 1979) and exploited in a systematic way in (Ei ner 1994). Interestingly, she acknowledges that any probably tells a more complex story than just non episodicity.

3 Note that FC markers like who/whichever (Dayal 1997) and quel qu’id soit are perfectly compatible with ‘standard’ (= non arbitrary) universal quantifiers, as evidenced by (a) and (b).
(a) Chaque étudiant quel qu’il soit est arrivé à l’heure
(2 each student, whoever he is, arrived on time)
(b) Smith’s murderer, whoever he is, left ashes in the ashtray.
In (b) there is no link between the property of being Smith’s murderer and that of having left ashes in the ashtray. So, although these markers can convey arbitrariness, as noted in (Giannakidou 1997), they do not impose it.

4 T&J (1997b) use variation to link PS and FC any, but at the cost of a rather complex analysis.

5 See Asher’s (1993) conceptual anaphora.

6 This remains true even in the case of a property like ∈ {1, 2, 3} mentioned above. Proving that every member of {1, 2, 3} is a member of {1, 2, 3} requires that we prove that a member of {2, 3} as such is a member of {1, 2, 3}. We may not select, say 1, prove that it belongs to {1, 2, 3}, then select, say 2, etc. We must start from an arbitrary member of the set, that is, an object which satisfy only the property of being a member of the set.

7 Tovena & Jayez (1998) go further on the same way by expressing the constraint on PS and FC uses any and le moindre in terms of events. I do not discuss this point here.