# Things and their Aspects

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(1) Lois believes Superman is invincible.

(2) Clark Kent = Superman.

(3) Lois does not believe Clark Kent is invincible.

Saul's Data:

(4) a. Superman always gets more dates than Clark Kent does.

b. ?? Superman always gets more dates than Superman does.

(5) a. Clark Kent went into the phone booth, but Superman came out.

b. ?? Clark Kent went into the phone booth, but Clark Kent came out.

(6) a. Chris hit Clark Kent, but he never hit Superman.

b. ?? Chris hit Clark Kent, but he never hit Clark Kent.

(7) a. Lois slept with Superman before she slept with Clark Kent.

b. ?? Lois slept with Superman before she slept with Superman.

(8) a. Superman has changed his way of dress, but Clark Kent hasn't.

b. ?? Superman has changed his way of dress, but Superman hasn't.

## A Pragmatic or Semantic Phenomenon?

- Truth Conditional difference between (a) and (b) variants
- Truth conditions dependent upon logical form
- So a semantic phenomenon. But different from attitude constructions

## A Paraphrase

(9) a. Superman as Superman always gets more dates than Superman as Clark Kent does.

b. Clark Kent as Clark Kent went into the phone booth, but Clark Kent asa Superman came out.

c. Chris hit Superman as Clark Kent, but he never hit Superman as Superman.

d. Lois slept with Superman as Superman before she slept with Superman as Clark Kent.

e. Superman as Superman has changed his way of dress, but Superman as Clark Kent hasn't.

(10) a. An isosceles triangle as such (i.e. as an isosceles triangle) is such that the sum of the interior angles = 180 degrees.

b. An isosceles triangle as a triangle is such that the sum of the interior angles = 180 degrees.

(11) a. John believes that Hesperus is Phosphorus

b. John believes that Hesperus is dim and that Hesperus is a planet.

c. John believes that Phosphorus is dim and that Phosphorus is a planet.

This seems to be a valid inference, but the following is not.

(12) a. John believes that Superman = Clark Kent

b. John believes that Superman as Superman always gets more dates than Superman as Clark Kent does.

c. John believes that Superman as Superman always gets more dates than Superman as Superman does.

## How to Analyze Qua Locutions

- give up substitutivity of = for = within thoughts. (Bad option; substitutivity of = for = *is* one of the laws of thought).
- as phrases are quotational. But they do permit some substitution inferences–viz. *John as an attorney* is equivalent as *John as a lawyer*.
- qua constructions as a particular type of (complex) prediction.

(13) a. John saw Fred as a soccer player.
b. ?? John saw Fred be a soccer player.

(14) a. That man is Mark
b. The prettiest city in the world is Paris.

These examples show us the 'is' of identity. On the other hand,

(15) John as Lear was fantastic, but John as Hamlet was boring.

The qua locution restricts the main predication.

# Landman's Axioms

1. John as a judge is John.
2. If John as a judge is corrupt and John as a judge is well-paid, then John as a judge is corrupt and well paid.
3. If taking bribes implies being corrupt then if John as a judge takes bribes then John as a judge is corrupt.
4. John as a judge is not both corrupt and not corrupt.
5. If John as a judge is corrupt, then John is a judge.
6. John as a judge either takes or doesn't take bribes.

## Landman's Problem

These axioms are plausible but lead to the following, well-known problem:

- From (1, 3): If John as a judge is John, John is a judge.
- From (1) John as a judge is John.
- So John is a judge
- But similarly from (5): If John as a non-judge is John, John is a non-judge
- So by parallel reasoning from (1) John is a non-judge or John is not a judge.

## Other Peculiarities

(16) a. That man is Mark

b. The prettiest city in the world is Paris.

the predication is naturally construed as one of identity. However, *as* predications appear to be different. Consider, first,

(17) a. John as Sam was interesting.

b. John as Sam earns more than $50K.

These examples sound strange

(18) John as Lear was fantastic, but John as Hamlet was boring.

To solve these puzzles, we have to do more than simply analyze the construction itself. We must rethink how predication works within and outside of *as* phrases, since *as* phrases affect how we understand the main predication. To say that John as a judge is corrupt is to say, roughly, that John is corrupt *insofar as* or *when* he is a judge.

## One Extensional Theory of Qua Locutions: Jaeger

- *John as a judge* presupposes that John is a judge. Rewrite Landman axioms to eliminate the inconsistencies.
- *as* prhrases hold in small situations, whereas normal predications hold in maximal situations or worlds (small situations are perceivable, large ones not).
- to account for the restriction on the main predication, Jaeger uses the binding mechanism for presuppositions in dynamic semantic. But he has to suppose that prediccates like *corrupt* or even *fantastic* all have hidden arguments to which the presupposition can bind.

(19) a. John makes good money for a janitor.

b. John as a judge makes good money for a janitor.

## Another Extensional Theory of Qua Locutions: Szabo

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- *John as a judge is* $\phi$ is true just in case there are states $s_0$ and $s \leq s_0$ such that
  - John is a judge in $s_0$ and
  - $\phi$ holds of John in $s$.
  - $\phi$ holds of John in all states $s_1$ such that $s \sqsubseteq s_1$ or $s_1$ is a state in some contextually salient alternative to John's being a judge (such as being a janitor).
- takes care of the restriction by qua phrases on main predication without postulating any hidden argument in the main predication.
- How do we get a compositional account of this semantics? (Rothstein, Kratzer)
- Failure to deal with intensional constructions and with the Saul data.

(20) a. I am unhappy now.
b. I am happy now.

Can one be simultaneously in a happy and an unhappy state? It would seem not.

Szabo modifies the standard Neo-Davidsonian view of predication by requiring that such predications hold not only of *some* state at the present moment but in *all* states that include that one, up to and including my maximal present state. Let us call this principle the *Persistence* of predications

But now suppose that John works two jobs and thus that (21) is true:

(21) a. John is a judge
b. John is also a janitor.

According to Persistence, John will then be both a judge and a janitor in his maximal present state.

## Another Constraint on Neo-Davidsonian Predication

(22) a. John as a judge is honest
b. John as a judge is corrupt.

- Universality:
  If $\phi as\ \psi\ \ \chi$ holds, then in any state $s$ in which $\phi$ has the property expressed by $\psi$, then the property expressed by $\chi$ applies to $\phi$ in $s$ as well. That is, if *John as a banker is corrupt* is true then in all states in which John is a banker, he is corrupt.

And now a contradiction!

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(23) a. As a judge, John makes \$50K.

b. But as a janitor, John only makes \$20K.

Assuming (21a,b), Persistence implies that John is a judge and a janitor in the maximal state of John (at the present time). According to Universality, the main predications in (23a,b) should hold of every state that satisfies the predication in the *as* clauses, But then, the maximal present state $s$ of John must be such that John makes \$50K in $s$ and such that John makes only \$20K in $s$, which is impossible.

- *as* phrases coerce their subjects into something that we represent as having aspects, one of which the *as* phrase picks out.
- Parts or aspects are objects with a type that is a constituent of the complex type of the whole they are part of. *as* phrases coerce their subjects into having a complex type.
- So for instance the *as* phrase in *John as a lawyer makes $ 50K* coerces *John* into having a complex type, one constituent of which is the type of being a judge; that part is the type of a part or aspect of John that the *as* phrase singles out and which the sentence as a whole says something about.

## Some more details

- *as* phrases are a productive means for producing new dot types.
- The *as* phrase introduces a variable with a type that is a constituent of the complex type of the subject of the main clause. This variable represents an aspect of the subject argument, and it serves as the argument for the main clause predication.
- *as* phrases are similar to copredications or lexical elements like *read* in that they coerce an element into having a complex type. But unlike other dot object inducing constructions, there appear to be few restrictions to the complex types that *as* phrases may introduce.
- *as* phrases are different from normal copredication devices in that they exploit one constituent of a dot object and leave the other undetermined.

## Partial Orders on Aspects

For any object $a$, we define a partial order $\mathbf{P}(a)$ as follows:

- $\mathbf{P}(a) = \langle \{x : \text{O-Elab}(a, x)\}, \sqsubseteq \rangle$ where
- $\mathbf{P}(a)$ always has a top element $a$: $(\forall u \text{O-Elab}(a, u)\} \rightarrow u \sqsubseteq a$
- types always pick out maximal parts or aspects of an object:

$$\frac{\vdash \phi \rightarrow \psi}{\vdash (\text{O-Elab}(u, x) \wedge \text{O-Elab}(v, x) \wedge y : \underline{\phi'} \wedge v : \underline{\psi'} \rightarrow u \sqsubseteq v}$$

In addition, we can even define operations on the objects in the partial order, like summation and complement:

- $x + y = \text{lub}\{x, y\}$

$$\frac{\lambda x\phi[t], (x : \alpha \bullet \beta, t : \alpha)}{\lambda y\{\exists x(\text{O-elab}(y, x) \wedge \phi\}[t], (t : \alpha, x : \alpha \bullet \beta, y : \alpha)}$$

The type assigments occur in parentheses.

• exploitation allows us to adjust types so that the lambda conversion of $\lambda x\phi$ with $t$ can proceed.

Head Principle: The head of a construction coerces its arguments. So an IP head may coerce its DP subject argument; a VP may coerce its DP object (or subject if we adopt a VP internal syntax for the subject DP).

Identifying variables entails that they have the same types:
$x_i = x_j \rightarrow (x_i : t \leftrightarrow x_j : t)$

- *as* is the head of a small clause that can type shift its subject DP (heads can coerce their arguments)
- subject DP is raised so that it can bind a trace in both the small clause and the main clause. Small clause is adjoined to the main clause.

(24) the semantics of *as*:
$\lambda Q \lambda w \lambda P As(Q[w], P)$
with the typing $\langle z, w : \top,\ P : t;\ Q : \top \Rightarrow t \rangle$

We can now combine this with the *as* phrase's complement and use standard rules for type unification to get:

(25) $\lambda w \lambda P As(\text{judge}(w), P)$,
with the type context $\langle w : \underline{\text{judge}} \rangle$

Combining this with the subject of the *as* phrase, which is $x_i$, a variable coindexed with the trace

in the main clause and with the subject DP of type $e$, we get:

(26) $\lambda P As(\text{judge}(x_i), P)$,
with the type assignment: $\langle x_i : \underline{\text{judge}} \rangle$

This now combines with the translation of the main clause. The $As$ operator now gives rise to a type shift on $x_i$, a $\bullet$ introduction, in which $x_i$ becomes a variable with the complex but underspecified type $? \bullet \underline{\text{judge}}$, while introducing an existential quantifier binding a fresh variable of the simple type $\underline{\text{judge}}$. After this type shift, we can now eliminate $As$ in favor of a simple conjunction:

(27) $\exists v(\text{judge}(v) \wedge \mathit{corrupt}(v) \wedge \text{O-Elab}(v, x_i))$,
with the type assignment: $\langle v : \underline{\text{judge}}, x_i : ? \bullet \underline{\text{judge}}, \rangle$

We now finally combine with the subject DP:[1]

(28) $\exists x_i(\text{john} = x_i \wedge \exists v(\text{judge}(v) \wedge \mathit{corrupt}(v) \wedge \text{O-Elab}(v, x_i)))$,
with the type assignment
$\langle j, x_i :? \bullet \underline{\text{judge}}, v : \underline{\text{judge}} \rangle$

[1] I've left off any typing for the subject DP. For details on how that might be added, see Asher and Pustejovsky (forthcoming).

## More Examples

(29) a. John as a judge makes \$50K a year.

b. John makes at least \$50K a year.

(30) a. John as a judge in town A makes \$50K a year.

b. John as a judge in town B makes \$60K a year.

c. John as a judge makes at least \$110K a year.

To handle these, exploit the partial ordering $\mathbf{P}$ over types to define for additive properties like have a certain salary a homomorphism $\mathbf{P}$ to a domain of quantities such that:

- $h(x + y) = h(x) + h(y)$

Consider for instance axiom (2):

2 If John as a judge is corrupt and John as a judge is well-paid, then John as a judge is well-paid and corrupt.

- $\exists y(\text{judge}(y) \wedge \text{O-elab}(y, j) \wedge \text{corrupt}(y))) \wedge \exists z(\text{judge}(z) \wedge \text{O-elab}(j, z) \wedge \text{well-paid}(z)))$ with the type assignment $(j :? \bullet \underline{\text{judge}}, z : \underline{\text{judge}}, y : \underline{\text{judge}}$ .

By our axioms on types, $z = y$ and the fact that $\sqsubseteq$ is a partial order, as they are both O-Elaborations of the same object and have logically equivalent types. So simplifying we get the desired conclusion:

- $\exists y \wedge (\text{judge}(y) \wedge \text{O-elab}(y, j) \wedge \text{corrupt}(y))) \wedge \text{well-paid}(y)))$ with the type assignment $y : \underline{\text{judge}}, j :? \bullet \underline{\text{judge}}$.

## More on the Axioms

Axioms (3-6) just follow as simple inferences or instances of theorems of classical logic. The only problematic axiom is (1):

(1) If John as a judge is John.

What we get for (1) is the following logical form:

This is not valid, because O-elab is not a reflexive relation.

## Names in the object of the Qua Locution

- DPs in object position of *as* phrases determine aspects of the subject. They contribute a type.
- How do names give a type? Not via their customary denotation, but by picking out a role or concept.

(9a) Superman as Superman always gets more dates than Superman as Clark Kent does.

(9a.1) $\exists y(s = y \wedge \exists z(\text{S-role}(z) \wedge \text{O-elab}(z, y) \wedge$
$\exists x(s = x \wedge \exists w(\text{CK-role}(w) \wedge \text{O-elab}(w, x) \wedge$
gets more dates than $(z, w))$
with the type context $x$ :? $\bullet$ $\underline{\text{S}}, y$ :? $\bullet$ $\underline{\text{CK}}$; $z : \underline{\text{S}}$; $w : \underline{\text{CK}}$.

We can further simplify this to:

(9a.2) $\exists z(\text{S-role}(z) \wedge \text{O-elab}(z, s) \wedge \exists w(\text{CK-role}(w) \wedge$
O-elab$(w, s)$
$\wedge$ gets more dates than $(z, w)))$
with the type context $s$ :? $\bullet$ $\underline{\text{S}}$ $\bullet$ $\underline{\text{CK}}$, $u$ : $\underline{\text{S}}$, $v : \underline{\text{CK}}$.

(10a') $\forall x, y((\text{Isos-trian}(x) \wedge \text{O-Elab}(x, y) \wedge \text{Isos-trian}(y)) \leftrightarrow$
the sum of the interior angles$(y) = 180°$

(10b') $\forall x, y(\text{Isos-trian}(x) \wedge \text{O-Elab}(x, y) \wedge \text{Trian}(y)) \leftrightarrow$
the sum of the interior angles$(y) = 180°$

## conclusions

- Qua locutions are difficult to analyze in a compositional way.
- Qua locutions are typing devices, introducing and exploiting complex types.
- Name denotations can't determine types; so names in object position of *as* phrases do something very funny and determine a type via an associated role or concept.