The Phenomenon: Type- vs. Token- Identity Statements

Identity statements involving the adjectives *same* and *different* often allow for **"type-identity"** readings in addition to their expected **"token-identity"** readings.

(1) Enzo owns the same car as I used to own.

- token-identity reading: I am a previous owner of the car that Enzo currently owns (e.g., Enzo purchased the car from me), so that Enzo's car is strictly identical to my previous car

- type-identity reading: the car that Enzo owns is of the same make, model, and year as the car that I used to own, but Enzo's car need not be strictly identical to my previous car (e.g., Enzo owns a 2000 Volkswagen Jetta, and I used to own another 2000 Volkswagen Jetta)

(2) The store sent me a different television than I had purchased.

- token-identity reading: I purchased one television set, and the store sent me another television set; the two televisions are not strictly identical, but they may be of the same brand and model (e.g., I purchased a used 13" Sony Trinitron TV in good condition, but the store instead sent me a used 13" Sony Trinitron TV in poor condition)

- type-identity reading: I purchased a television of a certain brand and model, and the store sent me a television of another brand and/or another model (e.g., I purchased a 21" Sharp Aquos TV, but the store instead sent me a 13" Sony Trinitron TV); of course, the two televisions are also not strictly identical

Asymmetric entailment relations amongst the two sorts of readings:

- for identity statements involving *same*, the token-identity reading will generally entail the corresponding type-identity reading, but not vice versa

- the pattern is reversed for identity statements involving *different*: the type-identity reading will generally entail the corresponding token-identity reading, but not vice versa

Two Possible Approaches: Polysemous *same* & *different* vs. Polysemous Nouns

Approach #1: the type- vs. token- distinction in identity statements results from variation in the denotations of *same* and *different*

- Heim (1985): *same* and *different* are ambiguous between '*x* is strictly (non-)identical to *y*' and 'the type that *x* instantiates is strictly (non-)identical to the type that *y* instantiates'; the former denotations give rise to the token-identity readings for (1) and (2), while the latter ones give rise to their type-identity readings

- Lasersohn (2000): relative to a context *C*, the nominal expression *same car as I used to own* in (1) denotes the set of cars that differ from my previous car only in ways which are pragmatically irrelevant in *C*; the type-identity reading of (1) arises in contexts where the only pragmatically relevant differences between Enzo's car and my previous car are those pertaining to their make and model
  (N.B. #1: Lasersohn ultimately modifies his proposal slightly in order to capture the obligatory definiteness of NPs containing *same*; cf. {*the*, **a*} *same car as I used to own*}.)
  (N.B. #2: Lasersohn does not analyze cases where *same* occurs with an *as*-clause. Following the spirit of his analysis, I assume that *as I used to own* in (1) simply picks out the (unique) car that I used to own.)

Approach #2: the type- vs. token- distinction in identity statements results from variation in the denotations of the head nouns that *same* and *different* combine with

- Nunberg (1984): the two readings for (1) and (2) reflect the possibility of interpreting the sentences against different models; in particular, their token-identity readings arise when the individuals in the model stand in a one-to-one correspondence to individuals in the world, while their type-identity readings arise when the individuals in the model stand in a one-to-many correspondence to individuals in the world (e.g., the model-theoretic individual stands as an exemplar for a class of real-world individuals). Under either reading, *same* and *different* express strict (non-)identity; what changes is the number of individuals (in the model) that *car* and *television* apply to.
  (N.B.: See Lasersohn (2000) for conceptual and empirical arguments against the specifics of Nunberg's proposal.)

The analysis developed here is a version of Approach #2 (though different from Nunberg's). Empirical support for it comes from the consideration of NPs that do <u>not</u> contain *same* or *different.*

Reference to Types in Natural Language, Part I

Evidence for Approach #2: the presence of *same* or *different* is not necessary for an NP to receive a type reading; reference to types can be accomplished with all sorts of NPs (e.g., definite, indefinite, quantificational).

(3) (Pointing at a copy of *The Great Gatsby*) I'd like to buy that book.

- token reading: I am interested in purchasing the indicated copy of *The Great Gatsby*; some other copy will not suffice
- type reading: I am interested in purchasing some copy of *The Great Gatsby*; it need not be the indicated one

(4) We have more than 10,000 books in stock. (Geurts 1996: (22))
(5) (Pointing at a pile of books) I've already read each of those books.

Krifka et al. (1995: 77) and Geurts (1996): the type readings for (3)–(5) involve reference to (or quantification over) **abstract individuals** analogous to those implicated in reference to (or quantification over) natural kinds (see, e.g., Carlson 1977, Krifka 1995, Chierchia 1998).

In support of these authors' suggestions, we can observe the following **parallels between type-reference and kind-reference**:

- **special predicates:** just as there are predicates that apply to kinds but not their instances, so too are there predicates that apply to types but not their tokens; certain predicates (e.g., *rare*) apply equally well to kinds and types

(6) a. This kind of animal is common throughout Asia.
b. That kind of bird is now extinct.
c. A Finnish engineer invented this kind of turbine.
d. That kind of animal is rare.

(7) a. This book was distributed widely.
b. That Sony television has been discontinued.
c. That car was designed by the engineers at GM.
d. This book is rare.

Reference to Types in Natural Language, Part II

- **existential/generic readings:** both kind and type terms give rise to existential readings in the presence of episodic predicates (cf. (8) and (9)) and generic readings in the presence of characterizing predicates (cf. (10) and (11))

(8) a. (Pointing at a picture of a spider monkey)
I saw that kind of monkey at the zoo today.
b. (Pointing at a red-tailed hawk)
That kind of bird was sitting in our tree yesterday.

(9) a. (Pointing at a friend's copy of *Lolita*)
I just checked that book out from the library.
b. (Pointing at an ad for a 2007 Porsche Carrera)
That car is parked in front of our house.

(10) a. (Pointing at a mosquito)
That kind of insect carries malaria.
b. That kind of animal suckles its young.

(11) a. (Pointing at an ad for a 21" Sharp Aquos TV)
That television costs more than 400 dollars.
b. That car gets good gas mileage.

- **"differentiated scope":** the examples in (12) and (13) have readings under which *everywhere* and *for two years* "scope over" the NPs *that kind of bird* and *that car* (under its type reading), in that the instances/tokens of the latter's referents may vary across locations and times

(12) a. That kind of bird is found everywhere.
b. (Spoken by a pet store owner)
We sold that kind of bird for two years.

(13) a. That car is for sale everywhere.
b. (Spoken by a car salesman)
We sold that car for two years.

- in contrast, the NPs *a bird* and *a car* (under their instance/token readings) in (14) and (15) obligatorily take wider scope than *everywhere* and *for two years*; because no variation of instances/tokens across locations or times is permitted, only the bizarre '$\exists > \forall$' interpretations are possible for these examples

(14) a. A bird is found everywhere.
b. (Spoken by a pet store owner)
We sold a bird for two years.

(15) a. A car is for sale everywhere.
b. (Spoken by a car salesman)
We sold a car for two years.

Reference to Types in Natural Language, Part III

- **pronominal anaphora:** in (16) and (17), both clauses may be read opaquely; in (16), neither Anna nor Nora is looking for a particular bird (instance), nor are they looking for the same bird (instance), while in (17) (with a type reading for *that car*), neither Anna nor Nora wants to drive a particular car (token), nor do they want to drive the same car (token)

(16) Anna is looking for that kind of bird, and
Nora is looking for it too.

(17) Anna wants to drive that car, and
Nora wants to drive it too.

- in contrast, both clauses must be read transparently in (18) and (19); in (18) (with an instance reading for *a bird*), both Anna and Nora are looking for a particular bird (instance), in fact the same bird (instance), while in (19) (with a token reading for *a car*), both Anna and Nora want to drive a particular car (instance), in fact the same car (instance)

(18) Anna is looking for a bird, and
Nora is looking for it too.

(19) Anna wants to drive a car, and
Nora wants to drive it too.

Conclusion: The facts in (3)–(19) show that **reference to types displays the characteristic properties of reference to natural kinds**, and justify the view that **abstract individuals corresponding to types exist alongside abstract individuals corresponding to kinds**.
(N.B.: in line with Krifka (1995: 402-3) and Chierchia (1998: 350-1), I assume that the distinction between kinds and types is a sortal distinction, and not an ontological one.)

The Analysis

Given the presence of types *qua* abstract individuals, **a very simple account of the token- and type-identity readings** for (1) becomes possible:

- **for both the token- and type-identity readings, strict identity ('=') is required to hold amongst Enzo's car and my previous car** (for identity statements involving *different*, such as (2), the relevant relation will be strict non-identity ('≠'))

- **the difference between the two readings lies in whether the cars are construed as car tokens or car types**, i.e., in whether the noun *car* applies to concrete or abstract individuals

(20) *Enzo owns the same car as Bill used to own* is true (under its token-identity reading) just in case
$\boldsymbol{own}(\boldsymbol{e}, \iota x_{tok}[\boldsymbol{car}(x_{tok}) \,\&\, x_{tok} = \iota y_{tok}[\boldsymbol{car}(y_{tok}) \,\&\, \boldsymbol{used\text{-}to\text{-}own}(\boldsymbol{b}, y_{tok})]])$ (x_{tok} and y_{tok} range over tokens)

(21) *Enzo owns the same car as Bill used to own* is true (under its type-identity reading) just in case
$\boldsymbol{own}(\boldsymbol{e}, \iota x_{typ}[\boldsymbol{car}(x_{typ}) \,\&\, x_{typ} = \iota y_{typ}[\boldsymbol{car}(y_{typ}) \,\&\, \boldsymbol{used\text{-}to\text{-}own}(\boldsymbol{b}, y_{typ})]])$ (x_{typ} and y_{typ} range over types)

Of course, even under its type-identity reading, (1) entails the existence of car tokens belonging to Enzo and myself:

- this entailment follows from the same mechanism that permits kind/type terms to occur in episodic contexts (cf. (8) and (9))

- specifically, we will extend Chierchia's (1998) 'Derived Kind Predication' (DKP) rule to cover types as well

(22) Derived Kind/Type Predication: If $\boldsymbol{P}$ does not apply to kinds/types and $\boldsymbol{a}$ denotes a kind/type, then $\boldsymbol{P}(\boldsymbol{a}) = \exists x[\boldsymbol{Realizes}(x, \boldsymbol{a}) \,\&\, \boldsymbol{P}(x)]$ (with pointwise generalization to n-place relations)

(23) *Enzo owns the same car as Bill used to own* is true (under its type-identity reading) just in case
$\boldsymbol{own}(\boldsymbol{e}, \iota x_{typ}[\boldsymbol{car}(x_{typ}) \,\&\, x_{typ} = \iota y_{typ}[\boldsymbol{car}(y_{typ}) \,\&\, \boldsymbol{used\text{-}to\text{-}own}(\boldsymbol{b}, y_{typ})]])$
$\Rightarrow \exists z[\boldsymbol{Realizes}(z, \iota x_{typ}[\boldsymbol{car}(x_{typ}) \,\&\, x_{typ} = \iota y_{typ}[\boldsymbol{car}(y_{typ}) \,\&\, \exists w[\boldsymbol{Realizes}(w, y_{typ}) \,\&\, \boldsymbol{used\text{-}to\text{-}own}(\boldsymbol{b}, w)]]]) \,\&\, \boldsymbol{own}(\boldsymbol{e}, z)]$
(via two applications of DKP)

Some Additional Data

Nunberg (1984) observes that type-identity readings are not always available: (24) cannot mean that one Ford Falcon crashed into another Ford Falcon.

(24) ?A Ford Falcon was headed south on Highway 101, went out of control, and crashed into the same car.

- our approach to type-identity readings suggests an explanation, namely that DKP cannot apply to resolve the type/episodic mismatch in (24)

- though the reasons for this failure remain obscure, the infelicity of (25) suggests that the account is on the right track

(25) (Pointing at a sports utility vehicle) ?Last week I almost crashed into that kind of car.
(cf. *Last week, I almost crashed into a sports utility vehicle*.)

Nunberg also notes the possibility of "mixed" readings for identity statements: (26) apparently asserts that the book token that Otto has been carrying around is identical to the book type that he voted to ban.

(26) Otto has been carrying around the same book as he voted to ban last year.

- under our approach, (26) can be analyzed as a case of type identity in which DKP applies in the matrix clause, but not in the *as*-clause, which determines a type-level individual

(27) *Otto has been carrying around the same book as he voted to ban last year* is true just in case
$\boldsymbol{carry}(\boldsymbol{o}, \iota x_{typ}[\boldsymbol{book}(x_{typ}) \,\&\, x_{typ} = \iota y_{typ}[\boldsymbol{book}(y_{typ}) \,\&\, \boldsymbol{voted\text{-}to\text{-}ban}(\boldsymbol{o}, y_{typ})]])$ (x_{typ} and y_{typ} range over types)
$\Rightarrow \exists z[\boldsymbol{Realizes}(z, \iota x_{typ}[\boldsymbol{book}(x_{typ}) \,\&\, x_{typ} = \iota y_{typ}[\boldsymbol{book}(y_{typ}) \,\&\, \boldsymbol{voted\text{-}to\text{-}ban}(\boldsymbol{o}, y_{typ})]]) \,\&\, \boldsymbol{carry}(\boldsymbol{o}, z)]$

References

Carlson, Gregory N. 1977. *Reference to Kinds in English*. Ph.D. dissertation, University of Massachusetts, Amherst. (Published in 1980 by Garland, New York.)

Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6: 339-405.

Geurts, Bart. 1996. On *no*. *Journal of Semantics* 13: 67-86.

Heim, Irene. 1985. Notes on comparatives and related matters. Available at http://www.semanticsarchive.net.

Krifka, Manfred. 1995. Common nouns: A contrastive analysis of Chinese and English. In *The Generic Book*, Gregory N. Carlson and Francis Jeffry Pelletier (eds), 398-411. Chicago: University of Chicago Press.

Krifka, Manfred, Francis Jeffry Pelletier, Gregory N. Carlson, Alice ter Meulen, Godehard Link, and Gennaro Chierchia. 1995. Genericity: An introduction. In *The Generic Book*, Gregory N. Carlson and Francis Jeffry Pelletier (eds), 1-124. Chicago: University of Chicago Press.

Lasersohn, Peter. 2000. *Same*, models, and representation. In *Proceedings of Semantics and Linguistic Theory 10*, Brendan Jackson and Tanya Matthews (eds), 83-97. Ithaca: CLC Publications.

Nunberg, Geoffrey. 1984. Individuation in context. In *Proceedings of the 3rd West Coast Conference on Formal Linguistics*, Mark Cobler, Susannah MacKaye, and Michael T. Wescoat (eds), 203-217. Stanford: Stanford Linguistics Association.