Two Strategies of Sameness

tong (identity) vs. *xiangtong* (maximal similarity) in Chinese

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Model the semantics of 'same'

(1)   Darci saw a flower. Betty saw the **same** flower.

- Two approaches in the literature
  1. Coreference/identity ($\lambda y \lambda x.x = y$)
  2. Maximal similarity ($\lambda y \lambda x. \forall P \in C[P(x) \leftrightarrow P(y)]$)
- Those who took the 2nd argued that identity is achieved by strict max.similarity
  – namely every single property is shared (Lasersohn 2000, Alrenga 2007a, Charnavel 2015, a.o.)

The goal of this talk

- The distinction between **identity** and **max.similarity** is NOT an issue of pragmatics and the grammar is sensitive to it (at least in some languages).
- In Mandarin Chinese, the distinction is represented by syntactically distinct lexical items:
  the determiner-like *tong* vs. the adjective *xiangtong*.

Outline

Basic distribution (Liao & Wang 2014)

(2)   (*na) **tong** (*na) yi   duo hua.
      that   *tong* that one CL   flower

- Must precede Num-CL (Num must be 'one');
  (2) can only be interpreted as definite;
  Other D-elements are blocked.

(3)   <**xiangtong**-de> (na yi   duo) <**xiangtong**-de> hua.
      xiang.tong-MOD that one CL   *xiang.tong*-MOD flower

- Take modificational marker *de*;
  Occur in typical positions for ADJs;
  (3) can be interpreted as definite/indefinite;
  Other D-elements are not blocked.

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  Occur in typical positions for ADJs;
  (3) can be interpreted as definite/indefinite;
  Other D-elements are not blocked.

- *tong* is determiner-like, *xiangtong* is an adjective (Liao & Wang)

Previous account (semantic part)

- Liao & Wang (2014)

  (4) Daiyu kandao-le yi duo meihua 'Daiyu saw a plum flower$_i$'...

     a. Baochai kandao-le **tong** yi   duo hua.
         Baochai see-PERF *tong* one CL   flower
         'Baochai saw the same piece of flower.' → token-identity

     b. Baochai kandao-le **xiangtong**-de   hua.
         Baochai see-PERF *xiang.tong*-MOD flower
         'Baochai saw the same type of flower.' → type-identity

- Capture the intuitions (for now):
  For (a): there is one flower that they saw in total.
  For (b): there are two flowers that they saw in total.

- Liao & Wang (2014)

  (4) Daiyu kandao-le yi duo meihua 'Daiyu saw a plum flower$_i$'...

  - a. Baochai kandao-le **tong** yi   duo hua.
    Baochai see-PERF   *tong*   one CL   flower

    'Baochai saw the same piece of flower.' $\rightarrow$ token-identity

  - b. Baochai kandao-le **xiangtong**-de   hua.
    Baochai see-PERF   *xiang.tong*-MOD flower

    'Baochai saw the same type of flower.' $\rightarrow$ type-identity

- Capture the intuitions (for now):
  For (a): there is one flower that they saw in total.
  For (b): there are two flowers that they saw in total.

- But more data shows this generalization is too hasty...

- *tong* is not limited to token-identity

    (5)   Baochai kandao-le tong yi   zhong hua.
             Baochai see-PERF   *tong* one CL_{type} flower

             'Baochai saw the same type of flower.'

Problem 1

- *tong* is not limited to token-identity

  (5) Baochai kandao-le tong yi   zhong hua.
       Baochai see-PERF *tong* one CL*type* flower
       'Baochai saw the same type of flower.'

- L&W attributes the token/type-identity ambiguity to DP/NP difference:

  (6) a. [*DP* THE-*tong* [*CLP* duo hua]] (DP denotes a token)
       b. [*NP* *xiangtong-de* [*NP* hua]] (NP denotes a type)

- Worry: The contribution of the classifiers is ignored in their proposal.

- *xiangtong* is not necessarily about type-identity

Problem 2

- *xiangtong* is not necessarily about type-identity
  [Scenario] There are three mushrooms in the plate and they are undistinguishable from each other in appearance.

(7) Yuehan chi-le   yi zhi   mogu.   Bier chi-le   (wanquan)
    John   eat-PERF one CL*token* mushroom Bill eat-PERF completely
    xiangtong-de   mogu.
    xiang.tong-MOD mushroom

    'John ate a mushroom. Bill ate the (exact) same type of mushroom.'

Problem 2

If it is the case, it is unexpected that a comment like (8) can be followed:

(8) danshi zhiyou Bier zhongdu-le,   yinwei tamen chi-de   bu shi
     but   only   Bill get.posioned-PERF because [they eat]-MOD not be
     tong yi   zhong mogu.
     tong one CL$_{type}$ mushroom
     'But only Bill got poisoned, because what they ate were not the same type of mushroom.'

- Here no identity between types is involved since one mushroom is poisonous while another is not thus they must belong to different types.
- Type-identity is even negated by 'not be *tong* one CL$_{type}$ N'

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     of mushroom.'

- Here no identity between types is involved since one mushroom is poisonous while another is not thus they must belong to different types.
- Type-identity is even negated by 'not be *tong* one CL*type* N'
- To conclude: token-identity and type-identity is not the best way to capture the semantic difference between *tong* and *xiangtong*!

Outline

Identity vs. max.similarity

- *tong* involves **identity** of references between entity-denoting expressions; Token-/type-identity depends on whether the classifier is token-/type-level

  (9) Baochai kandao-le tong yi   duo/zhong   hua
      Baochai see-PERF *tong* one CL_{token}/CL_{type} flower
      'Baochai saw the same {piece/type} of flower.'

Identity vs. max.similarity

- *xiangtong* involves **max.similarity** between entities
  Max.similarity is sensitive to context, and two mushrooms sharing every
  property in appearance do not need of be of the same type:

  (10) Bier   chi-le   xiangtong-de   mogu
        Baochai eat-PERF *xiang.tong*-MOD mushroom
        'Bill ate a mushroom that is maximally similar (in appearance).'

Outline

Evidence 1: Scalarity

- Max.similarity ($\lambda y \lambda x. \forall P \in C[P(x) \leftrightarrow P(y)]$) involves universal quantification over all the (relevant) properties
- Identity ($\lambda y \lambda x. x = y$) is a strict, non-quantificational relation

- Max.similarity ($\lambda y \lambda x. \forall P \in C[P(x) \leftrightarrow P(y)]$) involves universal quantification over all the (relevant) properties
- Identity ($\lambda y \lambda x. x = y$) is a strict, non-quantificational relation
- Test: whether it can be modified by 'almost' (Lee & Horn 1994, Amaral 2006, Alrenga 2010)
  ⇒ Need an identifiable standard value in a scale

  (11) a. John likes almost {every girl/all the girls/*some girls}.
        b. The bottle is almost {empty/full/*heavy/*light}.

- The prediction is born out:

(12) *Daiyu kandao-le yi duo hua.* 'Daiyu saw a plum flower'...

    a. Baochai kandao-le (**jihu**) **xiangtong**-de   hua.
       Baochai see-PERF almost *xiang.tong*-MOD flower

       'Baochai saw an (almost) identical flower.'

    b. Baochai kandao-le (***jihu**) **tong** yi duo/zhong   hua.
       Baochai see-PERF almost *tong* one CL$_{token}$/CL$_{type}$ flower

       'Baochai saw (almost) the same piece/kind of flower.'

- Max.similarity $(\lambda y \lambda x. \forall P \in C[P(x) \leftrightarrow P(y)])$ is contextually dependent
- Identity $(\lambda y \lambda x. x = y)$ is strict, not contextually dependent

Evidence 2: Contextual restriction

- Max.similarity ($\lambda y \lambda x. \forall P \in C[P(x) \leftrightarrow P(y)]$) is contextually dependent
- Identity ($\lambda y \lambda x. x = y$) is strict, not contextually dependent
- Test: whether an adverbial phrase like 'in color' can be added to overtly specify the contextual restriction

(13) *Daiyu kandao-le yi duo hua.* 'Daiyu saw a plum flower'...

    a. Baochai kandao-le (**zai.yanse.shang**) **xiangtong**-de   hua.
       Baochai see-PERF   in.color   *xiang.tong*-MOD flower

       'Baochai saw a flower that is maximally similar (in color).'

    b. Baochai kandao-le (*****zai.yanse.shang**) **tong** yi duo/zhong   hua.
       Baochai see-PERF   in.color   *tong* one CL$_{token}$/CL$_{type}$ flower

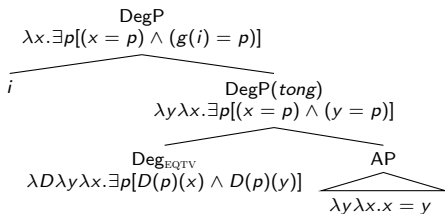   'Baochai saw the same piece/kind of flower (*in color).'

Interim summary

- New generalizations (semantics):
  tong $\Rightarrow$ identity (classifiers decide token-/type-identity)
  xiangtong $\Rightarrow$ max.similarity

- Any analysis should capture...
  Distributions: determiner-like vs. adjectival
  Semantics: identity vs. max.similarity

Analysis (*tong*)

- *tong* is decomposed into a Deg head (equative) and an identity relation
- After saturating the referential index introduced in the previous discourse: (14) denotes an indexical property 'being $g(i)$'

(14)

$$\underset{\lambda x.\exists p[(x = p) \wedge (g(i) = p)]}{\text{DegP}}$$

i

$$\underset{\lambda y \lambda x.\exists p[(x = p) \wedge (y = p)]}{\text{DegP}(tong)}$$

$$\underset{\lambda D \lambda y \lambda x.\exists p[D(p)(x) \wedge D(p)(y)]}{\text{Deg}_{\text{EQTV}}} \qquad \underset{\lambda y \lambda x.x = y}{\text{AP}}$$

Analysis (*tong*)

- The nominal predicate *hua* denotes a set of flowers (including both flower tokens and types); the classifier constrains it to one of the subdomains (Trinh 2011, Jenks 2018):
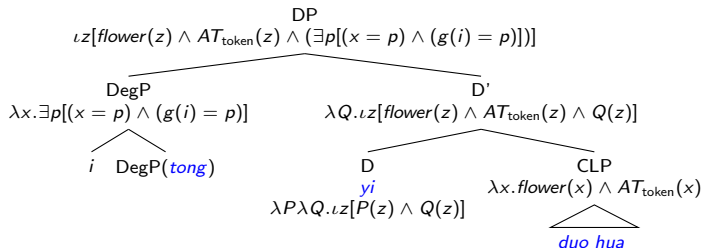 $[\![CLP]\!] = \lambda x.flower(x) \wedge AT_{\text{token/type}}(x)$

- *yi* 'one' functions as an anaphoric definite (in the sense of Schwarz 2009)
  Support: only *yi* but not other numerals can follow
  $[\![yi]\!] = \lambda P \lambda Q.\iota z[P(z) \wedge Q(z)]$

- The DegP (denoting an indexical property) is in the specifier of DP (Schwarz 2009)

Analysis (*tong*)

(15)

$$\text{DP}$$
$$\iota z[flower(z) \wedge AT_{\text{token}}(z) \wedge (\exists p[(x = p) \wedge (g(i) = p)])]$$

DegP
$$\lambda x. \exists p[(x = p) \wedge (g(i) = p)]$$

$$i \quad \text{DegP}(\textit{tong})$$

D'
$$\lambda Q. \iota z[flower(z) \wedge AT_{\text{token}}(z) \wedge Q(z)]$$

D
yi
$$\lambda P \lambda Q. \iota z[P(z) \wedge Q(z)]$$

CLP
$$\lambda x. flower(x) \wedge AT_{\text{token}}(x)$$

duo hua

- Account for its determiner-like distribution:
  1. The indexical property is structurally higher (Elbourne 2005, Schwarz 2009)
     ⇒ Must precede Num-CL
  2. *yi* as an anaphoric definite ⇒ Obligatory definiteness

- *xiangtong* is a relational adjective without the DegP structure
- After saturating the referential index i introduced in the previous discourse:
  (16) denotes an intersective property 'being max.similar to $g(i)$'

(16)

$$\text{AP}$$
$$\lambda x.\forall P \in C[P(x) \leftrightarrow P(g(i))]$$

i

$$\text{AP}$$

xiangtong
$$\lambda y \lambda x.\forall P \in C[P(x) \leftrightarrow P(y)]$$

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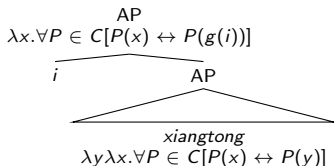(16)

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$\lambda x.\forall P \in C[P(x) \leftrightarrow P(g(i))]$

i

AP
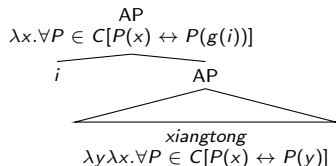
xiangtong
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- Account for its distribution as an ordinary adjective:
  1. (16) can compose with NP by Predicate Modification (Nothing special);
  2. (16) does not guarantee uniqueness $\Rightarrow$ Do not block other D-elements

- Why complicate the meaning of *tong*?
  $[\![tong]\!] = \lambda y \lambda x. \exists p[(x = p) \wedge (y = p)]$
  Truth-conditionally equivalent to: $\lambda y \lambda x. x = y$
- What motivates the DegP structure of *tong*?

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  $[\![tong]\!] = \lambda y \lambda x. \exists p[(x = p) \wedge (y = p)]$
  Truth-conditionally equivalent to: $\lambda y \lambda x. x = y$

- What motivates the DegP structure of *tong*?

  1. Previous literature: *same* resembles comparatives (Heim 1985, Oxford 2010, Charnavel 2015)

     (17) a. Betty saw the same flower as Darci did.

           b. Betty saw as nice a flower as Darci did.

           c. Betty saw a nicer flower than Darci did.

     (18) *Betty saw an identical/similar flower as Darci did.

  2. Scoping ability of *tong* (or English *same*) for internal readings

Extensions: Why DegP for *tong*

- Internal reading: the interpretation of *tong*/*xiangtong* is resolved within the sentence.

(19)   a.   nvhai-men xiangyao tong yi   duo hua.
           girl-PL   want   *tong* one CL   flower
           'The girls want the same piece of flower.'
           Every one of the girls wants the same flower that is the flower that any other girl want.

   b.   nvhai-men xiangyao (*yi duo) xiangtong-de   hua.
           girl-PL   want   one CL   *xiang.tong*-MOD flower
           'The girls want an identical flower.'
           Every one of the girls wants a flower that is max.similar to the flower that any other girl want.

- If both *tong* and *xiangtong* are relational terms, why only *tong* can license the internal reading in a singular form?

Extensions: Why DegP for *tong*

- If both *tong* and *xiangtong* are relational terms, why only *tong* can license the internal reading in a singular form?

- Note this contrast also holds between English *same* (an untypical adjective, Liao & Wang 2014, Oxford 2010) and other relational terms like *identical*, *similar* (more typical adjectives)

- If both *tong* and *xiangtong* are relational terms, why only *tong* can license the internal reading in a singular form?
- Note this contrast also holds between English *same* (an untypical adjective, Liao & Wang 2014, Oxford 2010) and other relational terms like *identical*, *similar* (more typical adjectives)
- Here I attribute the possibility of internal readings to the scoping ability of the Deg head within *tong*

Deriving internal readings: In brief

- Parasitic scope in (phrasal) comparatives (Heim 1985, Barker 2007)
- Scope out the Deg head to create a relation

  (20) Betty wants as nice a flower as Darci does.
       $\text{Deg}_{\text{EQTV}}(R)(y)(x)$
       $\rightarrow$ Compare x, y in terms of a relation R, where
       $[\![\text{Deg}_{\text{EQTV}}/as]\!] = \lambda D \lambda y \lambda x. \exists p[D(p)(x) \wedge D(p)(y)]$

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(21)   Betty wants the same flower as Darci does.
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   (21)   Betty wants the same flower as Darci does.
          $\text{Deg}_{\text{EQTV}}(\lambda d \lambda x.[x \text{ wants the flower that is } d])(d)(b)$
          $\exists p[(b \text{ wants the flower that is } p) \wedge (d \text{ wants the flower that is } p)]$

Conclusions

- Identity is not a strict case of max.similarity but is achieved in a very different way than max.similarity.
- Identity (indexical property) and max.similarity (intersective property) in Chinese are lexicalized into syntactically different *tong* and *xiangtong*
- Identity terms like *tong* (and English *same*) have some exceptional features that can be attributed to the existence of the DegP structure

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