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Mandarin demonstratives as strong definites:
An experimental investigation

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Introduction

- Major challenges for theories of definiteness:
  - how languages encode definiteness differently (Schwarz 2009; Arkoh & Matthewson 2013; Jenks 2018, i.a.),
  - the role of context in determining the choice of the different forms (e.g. Ahn 2019, 2023; Dayal & Jiang 2022; Bremmers *et al.* 2022; Simpson & Wu 2022; Hinterwimmer & Patil 2022; Saha *et al.* 2023, cf. Heim 1991)

Introduction

- Two main approaches to definiteness:
    1. **uniqueness** (Frege 1892; Russell 1905; Strawson 1950): Uniqueness approaches build on the insight that definite descriptions refer to entities that are *unique relative to some domain*.
    2. **familiarity/anaphoricity** (Heim 1982; Roberts 2003): Definite descriptions pick out referents that are **familiar** to the discourse participants, where familiarity is often understood as being **anaphoric** to a preceding linguistic expression.

Schwarz 2009, 2013

- Proposes a dichotomy between these two notions

- Manifested as two forms of definite articles in German (and many other Germanic dialects, e.g., Fering (Ebert 1971), Mönchen-Gladbach (Hartmann 1982), Bavarian (Scheutz 1988, Schwager 2007), Cologne (Himmelmann 1997), Rhineland (Heinrichs 1954, Hartmann 1967)).

(1) Der Empfang wurde **vom** / **#von dem** Bürgermeister eröffnet.
the reception was by.the$_{weak}$ / by the$_{strong}$ mayor opened
'The reception was opened by the mayor.' (Schwarz 2009: 40)

(2) Hans hat einen Schriftsteller und einen Politiker interviewt. Er hat
Hans had a writer and a politician interviewed he has
 # vom / **von dem** Politiker keine interessanten Antworten
from.the$_{weak}$ / from the$_{strong}$ politician no interesting answers
bekommen.
gotten
'Hans interviewed a writer and a politician. He didn't get any interesting
answers from the politician.' (Schwarz 2009: 30)

Other languages

This line of research has been pursued in a wide range of languages, including some where bare nouns are claimed to be unique definites, contrasting with another form as anaphoric definites.

- E.g., Akan (Arkoh & Matthewson 2013), Bangla (Biswas 2014), and Mandarin (Jenks 2018)

Yet these accounts have been challenged for each language:

- E.g., Akan (Bombi 2018, Owusu 2022), Bangla (Simpson & Biswas 2016), and Mandarin (Dayal & Jiang 2022, Bremmers et al 2022, Simpson & Wu 2022)

This study

- Specifically focuses on Mandarin
- Experimentally evaluates differing claims in the literature about Mandarin (definite) bare nouns and demonstratives in anaphoric contexts.
- Concludes that what have typically been called demonstratives pattern with anaphoric definites, connecting to observations about language change

Roadmap

1. Definites & Demonstratives in Mandarin

2. Crosslinguistic experiments

3. The Mandarin experiment

4. Analysis

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Definites & Demonstratives in Mandarin

Jenks (2018) (building on Schwarz 2009, 2013)

- Mandarin distinguishes uniqueness-based, i.e., *weak* (Frege 1892, Russell 1905), and anaphoric, i.e., *strong* (Heim 1982, Roberts 2003) definites.

- Bare nouns are used in *uniqueness* contexts and demonstratives in *anaphoric* contexts (3a).

(3) Jiaoshi   li   zuo zhe   yi ge nansheng yi ge nüsheng.
    classroom inside sit PROG one CL boy   one CL girl
    'There is a boy and a girl sitting in the classroom.'

    a. Wu zuotian   yudao {#∅/na ge} *nansheng*.
       I   yesterday meet ∅ that CL   boy
       'I met the boy yesterday.'

Jenks (2018) (building on Schwarz 2009, 2013)

- The weak and strong definite are identical in their assertive content (unlike Schwarz 2009), with the strong definite having a stronger presupposition.

- (4)   a.   *weak definite*: $\lambda s_r.\lambda P : \exists!x(P(x)(s_r)). \; \iota[P(x)(s_r)]$ (Jenks 2018: 513)

      b.   *strong definite*: $\lambda s_r.\lambda P.\lambda Q : \exists!x(P(x)(s_r) \wedge Q(x)). \; \iota[P(x)(s_r)]$

- The use of the weak definite (bare nouns) is blocked if the presupposition of the strong definite (demonstratives) is met (i.e., in anaphoric contexts). (Maximize Presupposition, Heim 1982)
  $\Rightarrow$ except for subject positions, where bare nouns are felicitous as anaphors since they are continuing topics, *not due to being strong definites*

- This is formalized as the principle *Index!*

  - (5)   *Index!*
        Represent and bind all possible indices.   (Jenks 2018: 524)

Dayal & Jiang (2022)

- Mandarin bare nouns are felicitous in both uniqueness and anaphoric contexts regardless of syntactic position (3b), while demonstratives are standard demonstratives.

- In case of change/ expansion in situation from the context situation (3) (such as including a new participant (3a)), demonstratives are preferred, but otherwise, bare nouns are preferred (3b).

(3) Jiaoshi   li   zuo zhe   yi   ge nansheng yi   ge nüsheng.
     classroom inside sit   PROG one CL boy   one CL girl
     'There is a boy and a girl sitting in the classroom.'   [Context Situation]

    a. Wu zuotian   yudao {#∅/na ge} **nansheng**.
       I   yesterday meet ∅ that CL   boy
       'I met the boy yesterday.'   [Different situation]

    b. **Nüsheng** zuo zai   **nansheng** pangbian.
       girl   sit   DUR boy   side
       'The girl was sitting next to the boy.'   [Same situation]

Bremmers, Liu, van der Klis, & Le Bruyn (2022)

- Mandarin demonstratives are strong definites, but bare nouns are felicitous in both uniqueness and anaphoric context (checked only subject position for bare nouns).

- The anaphoric use of bare nouns requires the anaphoric link to be in the context situation (3b) [situation-level familiarity]; they are infelicitous if the second sentence introduces a different situation, via a temporal change from the context situation (3a) [text-level familiarity].

(3) Jiaoshi   li   zuo zhe yi ge nansheng yi ge nüsheng.
    classroom inside sit PROG one CL boy   one CL girl
    'There is a boy and a girl sitting in the classroom.'   [Context Situation]

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Simpson & Wu (2022)

Both demonstratives and bare nouns are felicitous in anaphoric contexts.
Acceptance rates are regulated by two factors:

- Discourse coherence:
  - Bare nouns are fully grammatical when *discourse coherence* between the context and the follow-up sentences is high, i.e., shared time, location, and speaker perspective.
  - Demonstratives are preferred in case of breaks in coherence and continuity, i.e., shifts in time, location, or perspective between two paired sentences

- Post-verbal object position:
  - This position is generally the locus of new information, and bare nouns tend to be indefinites in this position; thus less preferred as anaphoric definites.

Crosslinguistic experiments

Saha (2023) & Saha, Sağ, & Davidson (2023)

Anaphoric demonstratives vs. anaphoric definites

- The acceptability of anaphoric demonstratives is sensitive to discourse contexts unlike definites, based on experimental data from three languages.
  - one with determiners: **English**
  - two determinerless languages encoding definiteness distinctly:
    Turkish via bare nouns, **Bangla** via noun-classifier construction

- In addition to the effects of situation as mentioned in the previous literature, we observe that the presence of another contrasting NP in the context sentence affects the acceptability of demonstratives:

(4) a. A boy entered the classroom. That boy sat down in the front row.
  b. A boy and a girl entered the classroom. ??That boy sat down in the front row.

Saha (2023) & Saha, Sağ, & Davidson (2023)

Our study crossed:

1. The presence or absence of a contrasting noun in the context sentence

2. A follow-up sentence anchored to either the same or a different situation from the context situation.

(5) {[$_{OneNP}$ A boy] / [$_{TwoNP}$ A boy and a girl]} entered the classroom.

    a. The/That boy sat down in the front row.   **(Same Situation)**

    b. I had noticed the/that boy at a coffee shop yesterday.   **(New Situation)**

- New situations introduced both a **new event participant** and **a temporal change**.

Saha (2023) & Saha, Sağ, & Davidson (2023)

- We adopted a **dual presentation** design (following Marty *et al.* 2020).
- Direct comparisons between conditions on the same screen can draw out subtle contrasts between conditions more effectively.
- Highlights the aspect of the judgment which the experimenter intends the participant to focus on (not, for example, choices of nouns and verbs, overall likelihood of the scenario, etc.).
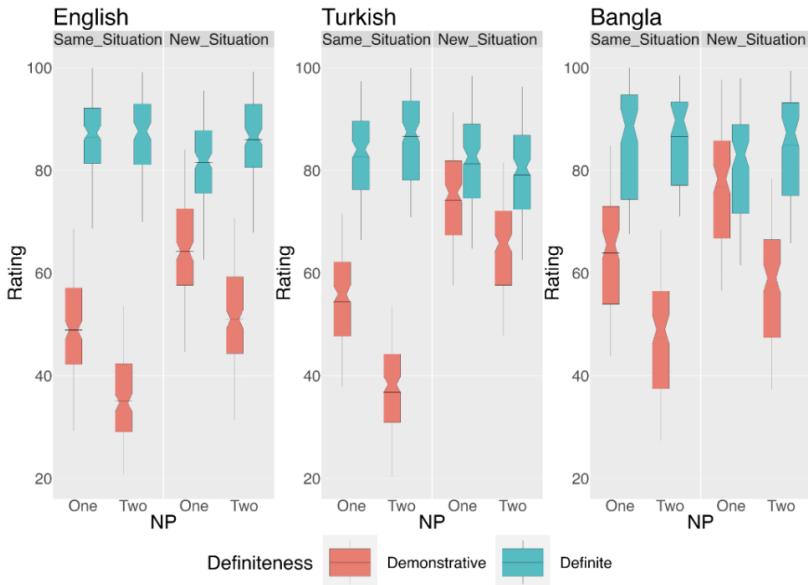
A boy and a girl entered the classroom.

I had noticed that boy at a coffee shop yesterday.

Least natural   **Most natural**

I had noticed the boy at a coffee shop yesterday.

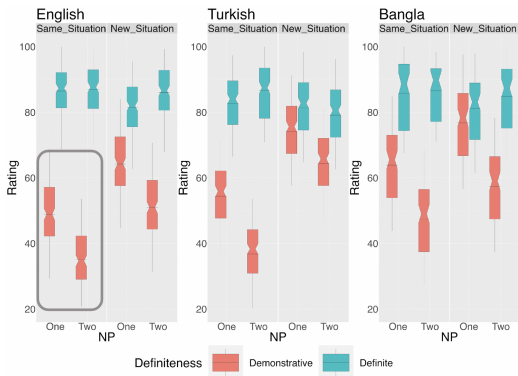**Least natural**   **Most natural**

Saha (2023) & Saha, Sağ, & Davidson (2023)

Saha (2023) & Saha, Sağ, & Davidson (2023)
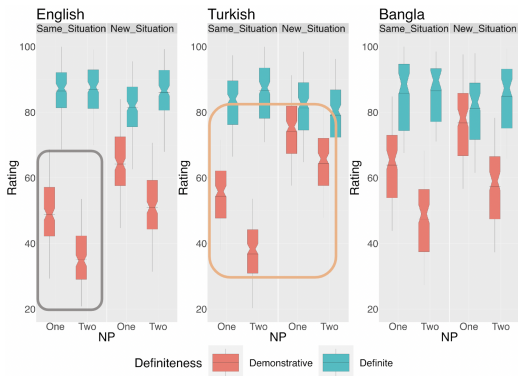
- Demonstratives: sensitive to the presence of a contrasting noun in the context sentence, i.e., the number of NPs (**one vs. two**)

Demonstratives rated significantly lower in NP contrast cases

Saha (2023) & Saha, Sağ, & Davidson (2023)

- **Demonstratives:** sensitive to the situation of the follow-up sentence

Demonstratives rated significantly lower in NP contrast cases

Demonstratives rated significantly higher in New Situation follow-ups

Summary: Previous studies

- Acceptability of demonstratives in anaphoric contexts overall seem to be correlated with
  - different/new situation (i.e., breaks the discourse coherence)
  - (lack of) NP contrast
- As for definites, Mandarin bare nouns seem controversial, as opposed to the consistent pattern seen in other languages.

The Mandarin experiment

Critical manipulation

Our Mandarin design (following Saha 2023 & Saha *et al.* 2023)

(6) {[$_{1NP}$ yi   ge nanhai]/ [$_{2NP}$ yi   ge nanhai he yi   ge nvhai]}
      one CL boy   one CL boy   and one CL girl

zoujin   le jiaoshi.
walk.into PERF classroom
'A boy/A boy and a girl walked into the classroom.'

  a. {∅/na ge} *nanhai* zuozai qianpai.
     ∅/that CL boy   sit.at front.seat
     'The/That boy sat at the front.'   [Same Situation]

  b. wo zuotian   zai shudian jian guo {∅/na ge} *nanhai*.
     I   yesterday at bookstore see PERF ∅/that CL boy
     'I saw the/that boy at the bookstore yesterday.'   [New Situation]

Methods

- Latin Square 2x2x2 design crossing NP (**1 vs. 2**) and situation (**new vs. same**) across 12 scenarios
- Factors balanced
    - Syntactic position of the target nouns (half subject and half object positions)
    - Animacy of the target nouns (half animate and half inanimate)
    - Order of bare nouns (definites) and demonstratives counterbalanced
- 64 Mandarin participants recruited via Prolific Academic platform
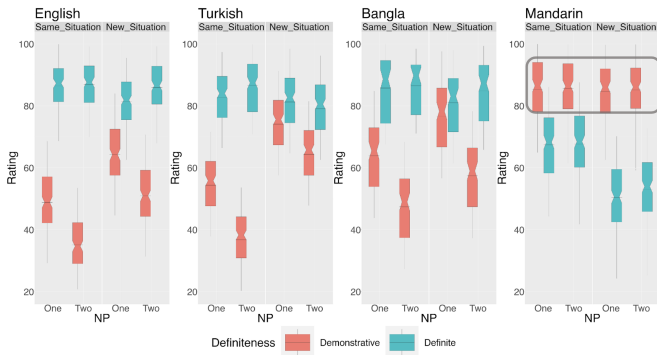
一个男孩和一个女孩走进了教室。

我昨天在书店见过那个男孩。

| 最不自然 | 最自然 |

我昨天在书店见过男孩。

| 最不自然 | 最自然 |

Figure: Screenshot of the Mandarin experiment in the 2 NP New Situation condition
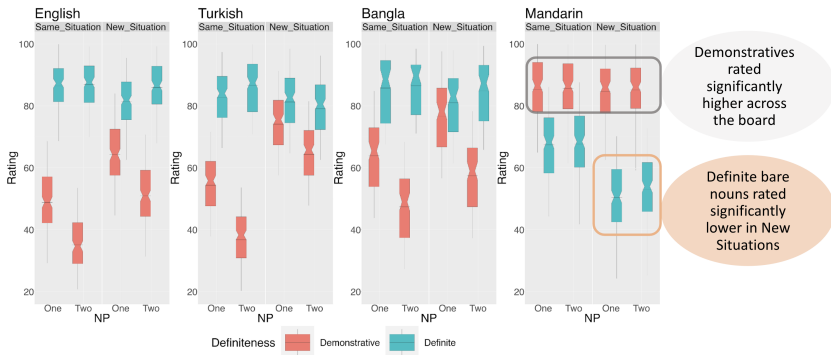
Core findings

★ Mandarin data **contrast** with the consistent pattern of the paradigm in English, Turkish, and Bangla.

Demonstratives rated significantly higher across the board

Core findings

★ Mandarin data **contrast** with the consistent pattern of the paradigm in English, Turkish, and Bangla.


Demonstratives rated significantly higher across the board

Definite bare nouns rated significantly lower in New Situations

Core findings: Demonstratives

- Demonstratives in Mandarin **do not** exhibit the sensitivity to discourse context seen in demonstratives in the other languages.
- ⋆ Whereas demonstratives in other languages show a clear effect of situation change (in line with Dayal & Jiang), we do *not* find this to be the case in Mandarin.
- ⋆ Mandarin demonstratives pattern, instead, with anaphoric definites in this paradigm, making them compatible with Jenks' claim of them marking *strong* definiteness.
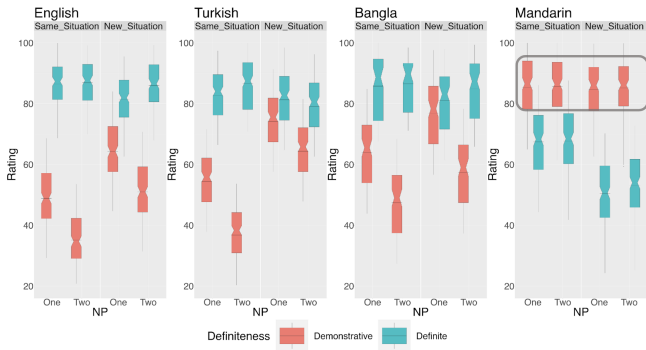
Core findings: Bare nouns

⋆ Bare nouns: (partly) found felicitous
  ⇒ in line with Dayal & Jiang, Bremmers *et al.* and Simpson & Wu, contrary to the prediction of Jenks' *Index!* (blocks the use of bare nouns in anaphoric contexts)

⋆ The acceptability of bare nouns improved in the absence of situation change.
  ⇒ in line with Bremmers *et al.* and Simpson & Wu.
  BUT they did not reach/ surpass the acceptability of demonstratives.
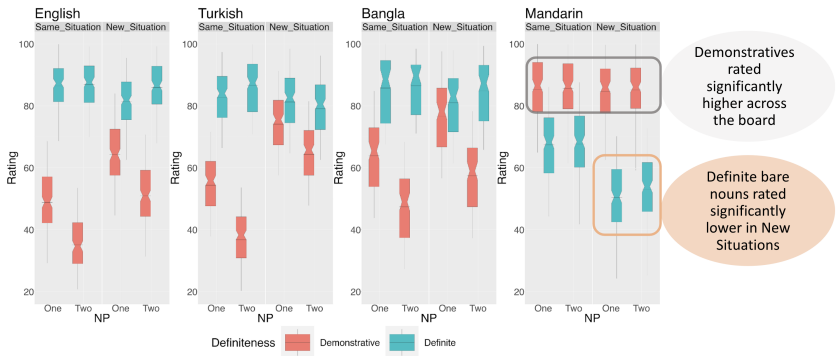
Analysis

A focus-driven approach to demonstratives

Saha, Sağ, & Davidson (2023)

- Definite and demonstrative determiners in anaphoric contexts:

(7) $[\![\text{DEF}]\!] = \lambda s.\lambda y.\lambda P : \exists! x \, [P_s(x) \wedge x = y].\ \iota x \, [P_s(x) \wedge x = y]$

(Schwarz 2009)

⤳ takes a situation s and an index argument y besides a property P and returns the unique individual that both satisfies P and equals y in s, if defined

(8) $[\![\text{DEM}]\!] = \lambda s.\lambda y.\lambda P : Maximal(s) \wedge \exists! x \, [P_s(x) \wedge x = y] \wedge |P_s| > 1.$
$\iota x \, [P_s(x) \wedge x = y]$ (building on Dayal & Jiang 2022)

⤳ differs in definedness conditions:

▶ the existence of a unique individual that both satisfies P and equals y in
$s_1 \oplus s_2$ *uniqueness*

▶ the set denoted by P must have cardinality greater than 1 in $s_1 \oplus s_2$.
                                                                                     anti-uniqueness

A focus-driven approach to demonstratives

Saha, Sağ, & Davidson (2023)

- Definites are used in *the absence of focus* in the DP or when *focus is on the entire DP*.

(9)   a.   the boy (no focus with DP)   e.g. 1 NP cases
$[[\text{DEF } 1] \text{ boy}]^o = \iota x[boy(x) \wedge x = g(1)]$

      b.   the BOY (as opposed to the girl)   e.g. 2 NP cases
$[[\text{DEF } 1] \text{ boy}_F]^f = \{\iota x[boy(x) \wedge x = g(1)], \iota x[girl(x) \wedge x = g(2)]\}$

- Demonstratives come with *obligatory focus on the index argument.*

(10)   THAT boy (as opposed to another boy)   e.g. 1 NP, New S cases
$[[\text{DEM } 1_F] \text{ boy}]^f = \{\iota x[boy(x) \wedge x = g(1)], \iota x[boy(x) \wedge x = g(3)]\}$

(11) $[_{OneNP}$ A boy] entered the classroom. I had noticed that boy at a coffee shop yesterday.   **(New Situation)**

A focus-driven approach to demonstratives

Demonstratives

- **Degraded in Two NP cases:** bias towards the placement of focus on the whole DP

(12) [*TwoNP* A boy and a girl] entered the classroom.
    a. That boy sat down in the front row.   **(Same Situation)**
    b. I had noticed that boy at a coffee shop yesterday. **(New Situation)**

- **Degraded in Same Situation cases:** continuation with a new situation is most compatible with considering a maximal situation involving other boys

(13) [*OneNP* A boy] entered the classroom.
    a. That boy sat down in the front row.   **(Same Situation)**
    b. I had noticed that boy at a coffee shop yesterday. **(New Situation)**

Mandarin demonstratives

How about Mandarin?

- ⋆ Unlike standard anaphoric demonstratives, which *mandatorily* evoke focus on the index argument, Mandarin demonstratives allow for the absence of focus on the index.

- ⋆ Therefore, they follow a pattern similar to definites in other languages, being acceptable across the board.

Mandarin demonstratives vs. bare nouns

Why a preference for demonstratives across the board?

- Mandarin sentences with bare nouns also have generic readings due to lack of tense and aspectual marking, as well as indefinite readings for postverbal bare nouns (e.g. Cheng & Sybesma 1999)

- In competition with these bare nouns, demonstratives here are unambiguously anaphoric, driving their preference across the board.

- In Same Situations, there is a bias towards referring to entities introduced previously; hence bare nouns fare better here as anaphors.[1]

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[1] See also Simpson & Wu (2022) for a similar conclusion.

Syntactic position of bare nouns

- **Jenks (2018)**: Bare nouns are *only* felicitous as anaphors in subject positions since they are continuing topics, *not due to being strong definites*.

- **Other studies** pose differing views on the role of syntactic position in anaphoric uses of bare nouns.
  - Dayal & Jiang (2022) argue for no sensitivity to syntactic position.
  - Simpson & Wu (2022) highlight the effect of post-verbal object position.

- **Our study**: We tested for the effects of syntactic position on bare nouns and found that it had *no significant effect*, and in fact trended in the opposite direction.

- Investigating the precise role of syntactic position is left for future research.

Conclusion

Conclusion

- We have **not** found a dichotomy between weak and strong definiteness in Mandarin contra Jenks (2018).
  - <u>Bare nouns</u> used in contexts of both weak and strong definites
- But we have found that Mandarin demonstratives pattern with other definites (*not demonstratives*) when it comes to the focus/anaphora manipulation.
  - i.e., <u>used in contexts of strong definites</u> in addition to their deictic/other demonstrative uses

Conclusion

- Compatible with studies of semantic change showing well-established grammaticalization clines across languages in contexts where both can occur (Diessel 1999): **demonstrative → (anaphoric) definite**

- Mandarin-specific properties (lack of tense-aspect marking, availability of generic and indefinite readings for bare nouns) contribute to this (see also Simpson & Wu 2022).

- Mandarin demonstratives are under pressure to resolve ambiguity imposed on bare nouns, and hence the observed change towards becoming a definite article.

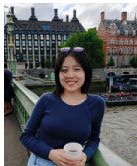- Turkish and Bangla demonstratives do not show a similar change due to a lack of such pressure.

Collaborators

Ankana Saha   Yağmur Sağ   Jian Cui   Kathryn Davidson

Thank you!

NSF BCS
CAREER Award
#1844186

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