Translation Mining: definiteness across languages. A reply to Jenks (2018)

1. Introduction

Jenks (2018) argues that the distinction between weak and strong definites (Schwarz 2009) is operational in Mandarin. He concludes that bare nouns can only be used for weak definites, whereas demonstratives are required for strong definites.[1] We showcase how translation corpora can help us check and nuance Jenks' claims.

The paper is organized as follows. In Section 2 we provide the relevant background on weak and strong definites across languages and zoom in on data, data collection and analysis. Section 3 presents our translation methodology, Section 4 our results, and Section 5 discusses and concludes. Our main claims are that Mandarin bare nouns are not *a priori* excluded from strong definite environments and that a more fine-grained typology of this type of environments is called for. Throughout the paper, we will further show that the translation methodology we exploit is a relevant addition to the linguist's toolbox.

2. Weak and strong definites across languages: data, data collection and analysis

We take *weak* and *strong* to be semantic notions that are instantiated by different forms across languages. This section gives a broad sketch of previous research. Section 2.1 looks at the data and the way they are typically collected, and Section 2.2 looks at how the weak vs. strong distinction has been analyzed. We also use Section 2.2 to give a first glimpse of the data and discussion that follow in Sections 3 to 5. In the examples in this section we use the following abbreviations: G(erman), A(kan), M(andarin), E(nglish).

2.1. Data and data collection

Schwarz (2009) brings together insights from Hawkins' seminal work on English definites

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[1] Jenks takes the subject position in Mandarin to independently allow for strong definite bare nouns. We sidestep this complication by restricting our discussion for Mandarin strong definites to non-subject positions.

(Hawkins 1978) and from a rich descriptive tradition on definites in other Germanic languages and dialects (e.g. Ebert 1971a,b). Schwarz' main data are taken from German.

What sets German apart from English is that it has two forms for the definite article: one rendering uniqueness – or 'weak' definiteness – and one rendering familiarity – or 'strong' definiteness. Weak/uniqueness definites are primarily the immediate and larger situation definites in Hawkins' typology, and strong/familiarity definites predominantly correspond to Hawkins' anaphoric definites. As for the associative (or bridging) uses Hawkins discusses, Schwarz argues some qualify as strong and others as weak.

The weak vs. strong distinction in German manifests itself formally in that weak definites contract with certain prepositions, whereas strong definites resist contraction. Outside the prepositional domain, no formal difference can be detected. Key examples from Schwarz (2009) are given in (1) and (2):

(1) **G:** Der Empfang wurde **vom/#von dem Bürgermeister** eröffnet.
             'The reception was opened **by the mayor**.'

(2) **G:** In der New Yorker Bibliothek gibt es ein Buch über Topinambur. Neulich war ich dort und habe **#im / in dem Buch** nach einer Antwort auf die Frage gesucht, ob man Topinambur grillen kann.
             'In the New York public library, there is a book about topinambur. Recently, I was there and searched **in the book** for an answer to the question of whether one can grill topinambur.'

The mayor in (1) has not been introduced before but is the unique mayor of the contextually salient town. This is a weak/uniqueness context and the definite contracts with the preposition. In (2), a book is introduced in the first sentence and referred back to in the second. This is a case of strong/familiarity definiteness and contraction is not allowed.

Several studies have followed up on Schwarz (2009) and have argued that the weak vs. strong distinction underlies definiteness paradigms in typologically diverse languages (see Aguilar-Guevara et al. 2019). We look into the case of Akan (Arkoh & Matthewson 2013; Bombi 2018) and then move to the case of Mandarin that Jenks (2018) focuses on.

Akan was one of the first languages the weak/strong distinction was extended to and has become a prime example supporting it. Even though the definiteness paradigm in Akan had been studied before (e.g. Amfo 2007), Arkoh & Matthewson (2013) were the first to link it to the bigger debate on types of definiteness in the tradition of Schwarz (2009).

Arkoh & Matthewson (2013) use data gathered through native speaker elicitation to argue that the weak/strong distinction is operative in Akan in the opposition between bare nouns and nouns introduced by the determiner *nó*. Key examples similar to those in (1) and (2) are given in (3) and (4):

(3)   **A:**   Ámstròng nyí nyímpá áà ó-dzí-ì kán tú-ù kó-ò **òsìrán** dò.
            Armstrong is person REL 3SG.SUBJ-eat-PAST first fly-PAST go-PAST moon top
            'Armstrong was the first person to fly to **the moon**.'

(4)   **A:**   Mò-tó-ò èkùtú. **Èkùtú** *(nó) yè dèw pápá.
            1SG.SUBJ-buy-PAST orange orange (NÓ) be nice good
            'I bought an orange. **The orange** was really tasty.'

(4) suggests that *nó* is obligatory in strong/anaphoric contexts. (3) shows that the bare noun suffices in weak/uniqueness contexts.

The facts in (3) and (4) do not warrant the conclusion that the weak/strong opposition is active in Akan. Starting with (3), Bombi (2018) notes that the acceptability of the bare noun is not sufficient to argue that *nó* is a strong definite. In order to do so, one should also show that *nó* is unacceptable in (3). Bombi however demonstrates that unique nouns like *moon* are

perfectly compatible with *nó*, unlike *von dem* in (1):

(5)   Context: Amma is outside reading a book. A stranger comes to her and says:

      A: **Bósómé** nó épíé.

              moon Nó fall

              '**The moon** is shining.'

(5) shows *nó* is not a strong definite in the same way as the German uncontracted definite.[2]

Turning to (4), we argue that it does not constitute a strong argument against the anaphoric potential of bare nouns. The reason for this is that even a run-of-the-mill definite article like English *the* is not particularly felicitous in this context:

(6)   **E:**   I bought an orange.   (a) ?? The orange was really tasty.

                                           (b) It was really tasty.

                                           (c) This orange was really tasty.

(7)   **E:**   I bought an orange and an apple. The orange was really tasty.

A comparison between (6a) and (6b) shows that objects introduced in short sentences like *John bought an orange* are preferably picked up by pronouns rather than definites. (7) shows how one way to avoid this preference for pronouns is to present the object in a coordination. (6c) further shows that the unacceptability of (6a) has to do with the definite rather than with determiners in general: the demonstrative in (6c) is felicitous, in particular if we present the orange as being special in some way or other (e.g. being *really* tasty rather than *just* tasty).[3]

The discussion about (6) and (7) suggests that test sentences like (4) contain a definite vs. pronoun bias. Arkoh & Matthewson (2013) and Bombi (2018) seem to be unaware of this or – at the very least – to make the assumption that a potential definite vs. pronoun bias should

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[2] Bombi does not comment on the fact that she uses a different noun for *moon* and looks at a different syntactic position. Arkoh & Matthewson's predictions are independent of either manipulation.

[3] The contrast between (6a) and (7) as well as the one between (6a) and (6c) deserve closer scrutiny. Future research should look into them while taking into account the role demonstratives play in strong definite environments in Mandarin (see Section 2.2. and Section 5).

affect the use of the bare noun in the same way as it affects the use of *nó*. We think it is wiser to reduce the number of assumptions and check whether a definite vs. pronoun bias is at play. To do so, one can introduce the orange in the first sentence of (4) as part of a coordination or render the introductory sentence more complex. Preliminary data from Bombi (2018) that were meant to look into the role of salience are revealing in this respect:

(8)   Context I (SALIENCE): Afia is on a bus, when a woman she doesn't know sits down beside her. The woman draws the window shade, letting in the sunlight. **The woman** says...
Context II (NO SALIENCE): Afia is on a bus, when a woman she doesn't know sits down beside her. **The woman** says...

Bombi (2018) reports that *The woman* in Contexts I and II can be rendered with *nó* and with the bare noun. Setting aside what this means for the role of salience, the crucial point for us is that the sentences in which the woman in question is introduced are more complex than the one in (4) and that the bare noun comes out as felicitous. These facts cast serious doubt on an analysis that takes Akan bare nouns to function as weak definites in the same way as contracted definites in German. With *nó* not being a strong definite either, there is little ground to maintain that the weak/strong distinction is active in Akan.

Turning to Mandarin, we zoom in on Jenks (2018). In the same way as Arkoh & Matthewson's argumentation, Jenks' is based on native speaker elicitation. He provides the following key examples (see the Appendix for character versions of the Mandarin examples):

(9)   **M:**   (#**Nà /zhè   ge**)   **táiwān (de) zǒngtǒng**   hěn   shēngqì.
that /this   classifier Taiwan('s)   president   very   angry
'**The president of Taiwan** is very angry.'

(10)   **M:**   Jiàoshì   lǐ   zuò-zhe yī   gè   nánshēng   hé   yī   gè
classroom in   sit-ASP one   classifier   boy   and   one classifier

nǚshēng.	Wǒ	zuótiān	yùdào	#(**nà gè**)	**nánshēng**
girl	I	yesterday	meet	that	classifier boy.

'There are a boy and a girl sitting in the classroom. I met **the boy** yesterday.'

(9) shows that unique individuals like the president of Taiwan typically occur bare and that demonstratives are not allowed with them. (10) shows how the bare noun *nansheng* cannot refer back to the boy in the first sentence even though the boy is coordinated with another noun. These facts build a strong case in favor of an active weak/strong distinction in Mandarin parallel to the contracted/uncontracted distinction in German. Even though Jenks relies on native speaker elicitation in the same way as Arkoh & Matthewson, he produces the relevant test cases ((3) vs. (9)) and controls for known biases ((4) vs. (10)).

2.2. Analysis

The basics of an analysis of weak and strong definites goes back to the semantics Schwarz (2009) proposes for each of them:

(11)   a. Weak Definite: $\lambda s.\lambda P:\exists!x\ (P(x)(s_r)).\ \iota x\ [P(x)(s_r)]$

   b. Strong Definite: $\lambda s.\lambda P.\lambda y:\exists!x\ (P(x)(s_r)\&x=y).\ \iota x\ [P(x)(s_r)\&x=y]$

Both weak and strong definites are linked to a pragmatically supplied resource situation formalized as the situation pronoun s_r in which the referent is unique. This uniqueness is spelled out both in the presuppositional and the asserted content. Strong definites are special in that they come with a pragmatically supplied index y that the referent of the definite is said to be identical to. This formalizes anaphoricity.

Schwarz assumes the situation pronoun s_r can stand for a contextually salient situation but can also be identified with the (Austinian) topic situation or be bound by a quantifier over situations. In the remainder of this paper we will focus on examples in which s_r is identified with the topic situation, i.e. the situation an utterance is about. We follow McKenzie (2012,

2015) in assuming that a situation can consist of multiple eventualities as long as a coherent relation can be established between them. In line with McKenzie's observations on Kiowa, we take spatiotemporal contiguity to be a good predictor for which eventualities can be considered to belong to the same situation.

Jenks' analysis of the weak/strong distinction differs from Schwarz'. The main difference does not lie in the definitions in (11) but in how the authors formulate the competition between the two types of definiteness. Where Schwarz allows overlap in the contexts in which the two types are used, Jenks excludes all overlap. This is a consequence of a principle he calls *Index!*. This principle is an instantiation of *Maximize Presupposition*, requiring the use of a semantically more involved expression as soon as context allows it. For weak and strong definites, it requires the use of the strong definite as soon as an anaphoric relation can be established. This effectively bars the use of weak definites in strong definite environments.

Both Schwarz and Jenks pay little attention to an asymmetry in their treatment of the situation pronoun and the index. Where the index models the dynamics of reference across sentence boundaries, there is no real dynamic treatment of the situation pronoun. What we mean by this is that nothing in the definitions in (11) taps into the relation between the topic situation of the current sentence and the topic situations of the preceding sentences. This state of affairs is standard in the literature: one either focuses on the dynamics of individuals or on the dynamics of eventualities – the closest one can get to situations – but never on the two at the same time, let alone on the interaction between the two.[4] To give an idea of what it could

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[4] See Karttunen (1976), Kamp (1981), Heim (1982) for foundational work on the dynamics of individuals and Kamp & Rohrer (1983), Kamp & Reyle (1993), Lascarides & Asher (1993) for foundational work on the dynamics of eventualities. See e.g. Bartsch (1995) and Cipria & Roberts (2000) for attempts at building bridges.

amount to if we work out this interaction, it is instructive to have another look at example (10) from Jenks as well as at a minimally different variant. We treat both in their English versions in (12) and (13):

(12)   **E:**   There are a boy and a girl sitting in the classroom. I met **the boy** yesterday.

(13)   **E:**   There were a boy and a girl in the classroom. I entered and hit **the boy**.

As we indicated above, we take spatiotemporal contiguity to be a good predictor for which eventualities are straightforwardly assumed to belong to the same situation. For (12), this means that the topic situation of the second sentence is unlikely to be the same as the topic situation of the first sentence: the meeting event is temporally and potentially also spatially disjoint from the situation in which the boy and girl are sitting in the classroom. The topic situations of the small discourse in (13) are different in that the state of being in the classroom and the events of entering and hitting are spatiotemporally contiguous and are thus likely to belong to a single situation.

For the English definite article, the existence of a single overarching topic situation does not matter, as *the boy* is felicitous both in (12) and (13). For the Mandarin versions of (12) and (13), we will however find that they behave differently, allowing an anaphoric bare noun in the latter but requiring – in line with Jenks' observations – a demonstrative in the former. This difference suggests that familiarity for the bare noun in Mandarin is evaluated at the level of situations: for a bare noun to be used anaphorically we need the referent to have been introduced in the situation the sentence is about. Familiarity in English is simpler and only looks at whether the referent has been introduced in the preceding text. We are thus facing two types of familiarity: the simpler text-level familiarity that we find in English and the more involved situation-level familiarity that we find in Mandarin. Modelling the restrictions on the

former does not require any interaction between the dynamics of indices and situation pronouns but modelling the restrictions on the latter does.

The above preview of our findings entails that Jenks' analysis of Mandarin demonstratives has to be revised. There is no ground to maintain that they are the standard way of marking strong definites in Mandarin. They do differ from bare nouns though in that they are not only able to pick up referents that have been introduced in the topic situation of the sentence they occur in but are also able to pick up referents that have been introduced in disconnected situations (as in (10)).

Part of the original appeal of Jenk's analysis of demonstratives as the standard way to express strong definites in Mandarin resides in the fact that Mandarin demonstratives seem to come with an open slot for indices. This is illustrated in (14) (from Jenks):

(14)   **M:**   Wǒ   xǐhuān [nǐmen   zhèxiē guāi   háizi].
       I   like   you   these   good   children
       'I like you good kids.'

Jenks considers *nimen* to be the explicit spell-out of the index and takes examples like (14) to be strong support for an analysis that takes demonstratives to be strong definites and bare nouns to be weak definites. We get back to these facts in our discussion in Section 5 and show that they are part of a bigger paradigm that favors our analysis over Jenks'.

3. Translation Mining

In Section 2.1 we saw how closely adhering to a testing paradigm is important in data collection through native speaker elicitation (cf. discussion of (3)). We however also saw that (hidden) biases in testing paradigms pose important challenges for this methodology (cf. discussion of (4)). These challenges become acute when the biases cannot be determined on the basis of the

languages researchers are proficient at (cf. preliminary discussion of (12) and (13)). Closely adhering to a testing paradigm is thus important but also always holds the risk of blinding us from variables that are at play in the languages we study but that we could not have anticipated on. The only way we can avoid this in native speaker elicitation is to recruit consultants that are good at tweaking our testing paradigms and telling us how minimal variations might be (in)felicitous. To avoid shifting all the burden to our consultants, we propose to extend our linguistic toolkit with techniques that allow us to actively search for unexplored semantic dimensions. The extension we propose is an exploratory data analysis technique known as Translation Mining (van der Klis et al. 2017). We briefly introduce how it works and then explain how we implement it for the present study.

3.1. Translation Mining: the basics

Translation Mining is a form-based exploratory data analysis technique that exploits the semantic (near-)equivalence of translated texts to study variation across languages. The software packages that compose it, retrieve relevant forms in one language, help the researcher to survey the translations of these forms in other languages, and use form variation in the source text and translations to build a semantic map (Haspelmath 1997). The technique is similar to – among others – those in Wälchli & Cysouw (2012) and Beekhuizen et al. (2017). The output of Translation Mining can best be illustrated with an example. We focus on the domain of tense and aspect in which we have applied the technique before (AUTHORS). The dataset we use to generate the semantic maps that follow is based on all indicative verb forms in the first chapter of Camus' *L'Étranger* with its translations to English, Spanish, Dutch, and German. A stylized version of the output for French is given in Figure 1:

[Figure 1 around here]

Figure 1 can be thought of as a two-dimensional representation of the semantic tense/aspect space as it is carved up in French with the four main tenses occurring in the corpus. Each of the colored shapes in Figure 1 groups actual contexts in which a certain verb form was used. The non-stylized version in Figure 2 illustrates:

[Figure 2 around here]

Each dot in Figure 2 represents an actual context in the corpus. In the online interface, each context can be retrieved by simply clicking on the relevant dot. The interface then returns the context with its respective translations as in Figure 3:

[Figure 3 around here]

The organization of the dots in Figure 2 is created using Multidimensional Scaling (MDS). Intuitively, what the algorithm ends up doing is to group all the contexts that use the same tense in a given language while taking into account the optimal groupings in the other languages. This allows for an easy comparison of tense use across languages. No direct linguistic interpretation can be given to the two axes of the map: they are not based on any pre-defined features, but are the outcome of the MDS algorithm.

Figures 4a to 4e show how the same semantic space as in Figure 1 is carved up differently across languages. We focus here on the division between the (perfective) Past and Perfect:

[Figure 4 around here]

Figure 4 shows that the Perfect is used most in French and least in English, with Spanish, Dutch, and German taking in-between positions. By zooming in on the contexts that distinguish between the languages, we can generate hypotheses about the variation we find and the dimensions it is sensitive to without making *a priori* assumptions about these dimensions. These exploratory hypotheses are then the input for native speaker elicitation.

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In what follows, we show that, despite the inherent limitations corpora come with, Translation Mining delivers, even if we use it on a small corpus and for domains that have been scrutinized in detail before (see also AUTHORS).

3.2. Translation Mining: weak and strong definites across languages

In Section 3.1. we showed how Translation Mining can be used as a broad exploratory data analysis technique. We can, however, also put it to work for more focused exploration of data, e.g. when we want to confirm that one or more dimensions that are relevant for a phenomenon in one language are also relevant for a phenomenon in another language. This is what we will be doing in the current paper. We will check whether the bare/demonstrative opposition in Mandarin and the dimensions it is sensitive to are the same as the opposition and related dimensions we find in German for contracted and uncontracted definites. To do so, we collect data on the contracted/uncontracted distinction in German and look at how they are rendered in Mandarin. Even though this is a fairly focused version of Translation Mining, our study remains exploratory in the sense that we make no assumptions about the dimensions that are active in the German contracted/uncontracted opposition nor in the bare/demonstrative opposition in Mandarin. We crucially do not select our German data on the basis of how well they conform to a certain analysis (e.g. along the lines of the weak/strong distinction) but solely on the basis of their form.

To avoid a translation bias, we focus on an English source text in which the weak vs. strong distinction is not traceable in the forms that are used. The corpus we selected is the first volume of the Harry Potter series and its translations to German and Mandarin. Our first step was to extract PPs in German and specifically those in which the preposition contracted with the definite following it or in which the preposition could have contracted. For the

uncontracted forms we selected all PPs in the novel. For the contracted forms we limited ourselves to forms in the first three chapters except for those contracted PPs that had an uncontracted counterpart with the same noun. In the latter case we extracted all occurrences in the novel. The goal of our selection procedure was to end up with a dataset with a more or less even distribution of contracted and uncontracted PPs, while at the same time maximizing the likelihood of including minimal pairs.

Once the set of German PPs established, we aligned them with the English original and the Mandarin translation. Alignment was done by two of the authors, one a native speaker of German and the other a native speaker of Mandarin. The number of parallel triplets we ended up with for German-English-Mandarin amounts to 96.

4. Results

4.1. Semantic maps and descriptive statistics

The results of Translation Mining are summarized in the semantic maps in Figure 5. For transparency we created a hybrid version of semantic maps between a stylized version and a version giving an idea of the spread of the datapoints involved. Per language we have added a colored shape for every construction that occurred at least four times.

[Figure 5 around here]

In German, the 96 datapoints contain 40 contracted cases and 56 uncontracted ones. In English 80 go definite, 5 bare singular and 4 demonstrative. In Mandarin, 79 go bare and 13 demonstrative. The datapoints in Figure 5 can be defined as tuples (e.g. <contracted, definite, bare>). Identical tuples land on the exact same locations on the maps. This explains why the maps may give the impression that there are fewer datapoints than there actually are.

In the following we zoom in on the data in German and Mandarin. An important

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methodological note is that all data were checked through native speaker elicitation. This underlines the fact that we consider Translation Mining a valuable addition to our toolbox but that we do not take it to replace native speaker judgements.

4.2. German

Even though our main interest lies with the Mandarin data, a good interpretation requires us to look into the German data as well. We remind the reader that we did not select our German data based on their representativity for any semantic analysis but solely based on their form. This means that it could turn out that the weak/strong distinction as defined in Section 2.2 is not active in German. Any comparison to these data would then have little bearing on the presence or absence of the weak/strong distinction in Mandarin. As it turns out, though, the German data by and large follow the predictions Schwarz' analysis makes.

The German data show that unique referents go contracted and that familiar referents go uncontracted. This is in line with the basic predictions an analysis along the lines of the weak/strong distinction makes:

(15)   **E:**   'I suppose we could take him to the zoo,' said Aunt Petunia slowly, '... and leave him **in the car** ...'

     G: 'Ich denke, wir könnten ihn in den Zoo mitnehmen', sagte Tante Petunia langsam, '... und ihn **im Wagen** lassen ...'

(16)   [Context: As the owls flooded into the Great Hall as usual, everyone's attention was caught at once by a long thin package carried by six large screech owls. Harry was just as interested as everyone else to see what was in this large parcel and was amazed when the owls soared down and dropped it right in front of him, knocking his bacon to the floor.]

     E: They had hardly fluttered out of the way when another owl dropped a letter **on top of the parcel**.

G: Sie waren kaum aus dem Weg geflattert, als eine andere Eule einen Brief **auf das Paket** warf.

The car in (15) does not refer back to a previously introduced car but to the unique family car. It consequently counts as a weak definite. The parcel in (16) refers back to the package that was introduced before and counts as a strong definite. As predicted by Schwarz, German relies on a contracted definite in (15) and an uncontracted definite in (16).

There are two types of contexts that deserve special mention. Both combine a dimension of uniqueness with a dimension of familiarity. The first type is concerned with reference to a familiar but one-of-a-kind stone known as the Philosopher's stone. The second type involves bridging. We find that the Philosopher's stone can be referred to both with contracted and uncontracted definites and that bridging is equally flexible:

(17) **E:** 'I'm going out of here tonight and I'm going to try and get **to the Stone** first.'

     G: 'Ich gehe heute Nacht raus und versuche als Erster **zum Stein** zu kommen.'

(18) **E:** 'How do you think you'd get **to the Stone** without us?'

     G: 'Wie glaubst du eigentlich, dass du ohne uns **zu dem Stein** kommst?'

(19) [Context: 'OUT!' roared Uncle Vernon, and he took both Harry and Dudley by the scruffs of their necks and threw them into the hall, slamming the kitchen door behind them.]

     E: Harry and Dudley promptly had a furious but silent fight over who would listen **at the keyhole** […]

     G: Prompt lieferten sich Harry und Dudley einen erbitterten, aber stummen Kampf darum, wer **am Schlüsselloch** lauschen durfte.

(20) [Context: Ducking under Peeves they ran for their lives, right to the end of the corridor, where they slammed into a door - and it was locked. [...]]

     E: 'Oh, move over,' Hermione snarled. She grabbed Harry's wand, tapped **the lock** and whispered, '*Alohomora*!'.

     G: 'Ach, geh mal beiseite', fauchte Hermine. Sie packte Harrys Zauberstab,

klopfte **auf das Türschloss** und flüsterte: "*Alohomora*!"

The Philosopher's stone is referred to with a contracted definite in (17) and with an uncontracted definite in (18). In (19) and (20), *Schlüsselloch* and *Türschloss* refer back to the lock of a previously introduced door but the former appears with a contracted definite whereas the latter combines with an uncontracted definite.

Rather than interpreting data like those in (17) to (20) as problematic for a weak/strong analysis, we take them to be indicative of the overlap Schwarz' analysis allows for. As soon as familiarity and uniqueness are combined, the preference for a contracted or uncontracted variant may depend on factors that do not directly follow from a weak/strong analysis. Given that Schwarz does not rely on a principle like *Index!*, these data do not pose an *a priori* problem for him.[5] We conclude that – despite some cases that deserve further scrutiny – the German data follow the predictions made by Schwarz, who analyzes contracted definites as weak and uncontracted definites as strong. This makes the contracted/uncontracted opposition into a good touchstone for checking whether the weak/strong distinction is active in the bare/demonstrative opposition in Mandarin.

4.3 Mandarin

If Jenks were right in assuming that the bare/demonstrative opposition in Mandarin is an instantiation of the weak/strong opposition along the same lines as the German contracted/ uncontracted opposition, we would have expected Figures 5a and 5c to be identical. This expectation is not borne out. In fact, the two oppositions seem to be orthogonal to one

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[5] We note that Schwarz adheres to a specific analysis of part-whole bridging for which the data in (19) and (20) are problematic. This need, however, not have direct consequences for the way he analyzes the weak/strong distinction in general.

another. In what follows we provide a more detailed exploration of the data and focus on the four unidirectional implications we would have expected if the Mandarin bare/ demonstrative opposition were similar to the German contracted/uncontracted opposition. Figure 6 gives an overview of the implications and summarizes the discussion that follows:

[Figure 6 around here]

4.3.1. Mandarin demonstrative -> German uncontracted definite

The maps in Figure 5 suggest that Mandarin demonstratives can correspond to German contracted and uncontracted definites alike. A closer look at the data, however, reveals that demonstratives always correspond to strong/uncontracted definites, exactly the way Jenks predicts they do. The few cases of contracted definites that go demonstrative in Mandarin (N=3) are arguably cases in which the demonstrative has its full deictic interpretation and not a familiarity definite interpretation. We illustrate in (21):

(21)   **E:**   'I'm not having one **in the house**, Petunia!'

      G: 'Ich will keinen davon **im Haus** haben, Petunia!'

      M: Pèinī, wǒ   juébù   ràng   tāmen   rènhérén jìn   **zhè dòng   fángzi**.'

                 Petunia I   not   have   them   anyone   enter this classifier   house

(21) is uttered by a house owner who assures his wife that certain people will never be welcome in their house. The proximal demonstrative that is used refers to the house the two are in at the moment of speech. With examples like these out of the way, our data are in line with a unidirectional implication from demonstratives in Mandarin to strong/uncontracted definites in German. Some illustrative examples are given in (22) and (23):

(22)   **E:**   But as all they knew for sure **about the mysterious object** was that it was about two inches long, they didn't have much chance of guessing what it was without further clues.

G: Doch weil sie **über das geheimnisvolle Ding** nicht mehr wussten, als dass es gut fünf Zentimeter lang war, hatten sie ohne nähere Anhaltspunkte keine große Chance zu erraten, was in dem Päckchen war.

M:	Dànshì,	guānyú nà	**gè**	**shénmì**	**wùjiàn**,	tāmen wéiyī
	But	about that	classifier	mysterious	object	they only
	nénggòu	quèdìng de	zhǐshì	tāde	chángdù	yǒu liǎng yīngcùn.
	can	be sure	just	its	length	have two inches
	Rúguǒ méi	yǒu	gèng duō de	xiànsuǒ,	shì	bù kěnéng
	if not	have	more	clue	be	not possible
	cāi	dào	tā	shì	shénme dōngxī	de.
	guess	out	it	be	what thing	de

(23) **E:** Harry looked up **at the giant.**

G: Harry sah **zu dem Riesen** auf.

M:	Hālì	tái	yǎn	kàn-zhe	**zhè**	**ge**	**jùrén**.
	Harry	raise	eye	look-ASP	this	classifier	giant

In (22) and (23) reference is made respectively to an object and a giant that were introduced before. Mandarin uses a demonstrative here where German uses an uncontracted form. This is in line with Jenks' predictions.

4.3.2. German contracted definite -> Mandarin bare noun

Analyzing demonstratives in examples like (21) as deictics rather than as familiar definites also clears the way for the unidirectional implication from weak/contracted definites in German to bare nouns in Mandarin. Relevant examples are given in (24) and (25):

(24)	**M:**	Wǒ xiǎng wǒmen	kěyǐ	dài	tā	dào	dòngwùyuán	qù, "
		I think we	could	take	him	to	zoo	go
		pèinī yímā	màn tūn tūn de		shuō,	"···ránhòu	bǎ	tā
		Petunia Aunt	slowly		say,	...then	BA	him
		liú	**zài**	**chē**	shàng··· "			

| | | leave | in | car | on… |

"'I suppose we could take him to the zoo." Aunt Petunia said slowly, "... and leave him in the car...'"

(25) **E:** While Uncle Vernon made furious telephone calls **to the post office** and the dairy trying to find someone to complain to, Aunt Petunia shredded the letters in her food mixer.

G: Während Onkel Vernon wütend **beim Postamt** und bei der Molkerei anrief und versuchte jemanden aufzutreiben, bei dem er sich beschweren konnte, zerschnitzelte Tante Petunia die Briefe in ihrem Küchenmixer.

M:
| Fú nóng yífu nù chōngchōng | **de gěi yóujú**, | nǎi chǎng dǎ diànhuà |
| Vernon Uncle furiously | to post office | dairy make call |

| zhǎo | rén | shuōlǐ. | Pèi nī | yímā | zhènghǎo bǎ | èrshísì |
| find | someone | complain | Petunia Aunt | just | BA | twenty-four |

| fēng | xìn | dōu sāi | dào | shípǐn fěnsuì jī lǐ jiǎo dé | fěnsuì. |
| classifier | letter | all insert | food | processor in | shred to pieces |

(24) is the Mandarin version of (15). The car refers to the unique car in the context and goes contracted in German and bare in Mandarin. In (25), reference is made to the unique post office in the vicinity. Just like the unique car in (24), the post office goes contracted in German and bare in Mandarin.

4.3.3. German uncontracted definite -/-> Mandarin demonstrative and Mandarin bare noun -/-> German contracted definite

In the preceding we have seen that – in line with Jenks' predictions – the use of demonstratives in Mandarin implies the use of strong/uncontracted definites in German, and the use of weak/contracted definites in German implies the use of bare nouns in Mandarin. Crucially, however, the reverse implications do not hold. The reason for this is that bare nouns occur in anaphoric (strong) environments. (26) and (27) are relevant examples from the corpus:

(26) **M:**   Tāmen pūshan-zhe chìbǎng gānggāng fēi zǒu, yòu

They flutter-ASP wings right fly away, and

yǒu yī zhǐ māotóuyīng xié lái yī fēng xìn,

have one classifier owl bring come one classifier letter

rēng zài **bāoguǒ** shàngmiàn.

throw to parcel on.

'They had hardly fluttered out of the way when another owl dropped a letter on top of the parcel.'

(27) [Context: Dudley quickly found the largest snake in the place. It could have wrapped its body twice around Uncle Vernon's car and crushed it into a dustbin - but at the moment it didn't look in the mood. In fact, it was fast asleep […]]

E: He looked back **at the snake** and winked, too.

G: Er drehte sich wieder **zu der Schlange** um und zwinkerte zurück.

M: Tā huí-guò tóu lái kàn-zhe **jù mǎng**, yě duì

he back-ASP head to stare-ASP huge snake too to

tā zhǎ-le-zhǎ yǎn.

it wink-ASP-wink eye.

(26) is the Mandarin version of (16). In (26) and (27) reference is made, respectively, to a parcel and a snake that were introduced before.

Our consultants have consistently confirmed the felicity of examples like (26) and (27) in context. These examples show that there is no implication from strong/uncontracted definites in German to Mandarin demonstratives nor from bare nouns in Mandarin to German weak/contracted definites.

4.4 Summary of the results

In this section we have seen that our data support Schwarz' claim that the German opposition between contracted and uncontracted definites is an instantiation of the weak/ strong opposition. Jenks' claim that the distinction between bare nouns and demonstratives is another

instantiation of the same opposition is not supported by the facts. The main problem Jenks faces is that bare nouns occur in unambiguously strong contexts.

5. Discussion and conclusion

The results in Section 4 show that our corpus data support an analysis of the German contracted/uncontracted opposition along the lines of the weak/strong distinction but that a similar analysis for the Mandarin bare/demonstrative opposition is not supported. The main problem for the Mandarin case lies in the fact that bare nouns occur in strong environments (see e.g. (26)). The question we turn to in this section is how the Mandarin facts are then best accounted for. At the heart of the discussion lies an interesting discrepancy between our data and Jenks': Jenks uses examples like (10) to argue that bare nouns are ungrammatical as anaphors whereas we find examples like (26) in which bare nouns are perfectly fine as anaphors. Understanding how these examples relate to one another is the key to understanding the analysis of the bare/demonstrative opposition in Mandarin.

Let us first discard the obvious hypothesis that the difference we find between judgements on (10) and (26) is due to a dialectal difference. This could be the case as our consultants are from mainland China whereas Jenks' are from Taiwan. Our consultants however agree with Jenks' in that (10) is unacceptable. The opposition between (10) and (26) is thus a real one.

A second hypothesis is that there is no index at play in examples like (26) and that the felicity of the bare noun solely relies on the package being unique in the topic situation. This would make examples like (26) fall in line with Jenks' predictions: in the absence of an index the bare noun is predicted to be acceptable. Even though we think this position is ultimately not tenable, it is interesting to briefly explore it.

An important assumption the second hypothesis relies on, is that the previous introduction of

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a referent cannot only be exploited from a familiarity perspective but also from a uniqueness perspective. One straightforward restriction we expect to be at play from the latter perspective is that the topic situation of the sentence the referent was introduced in is the same as the topic situation of the sentence the anaphor occurs in. As we indicated in Section 2, this restriction seems to be active for the bare noun in Mandarin: for the bare noun to be used anaphorically, we need there to be spatiotemporal contiguity between the eventualities of the sentence the antecedent occurs in and the eventualities of the sentence the bare noun occurs in. This restriction of spatiotemporal contiguity is confirmed by the minimal pairs (10)/(28) and (26)/(29):

(28) **M:** Jiàoshì   li   yǒu   yī   gè   nánhái hé   yī   gè   nǚhái.

classroom in   have   one   classifier boy and   one classifier girl

Wǒ   jìn   jiàoshì   dǎle   **nánhái**.

I   enter classroom   hit-ASP boy

'There were a boy and a girl in the classroom. I entered and hit the boy.'

(29) [Context: As the owls flooded into the Great Hall as usual, everyone's attention was caught at once by a long thin package carried by six large screech owls. Harry was just as interested as everyone else to see what was in this large parcel and was amazed when the owls soared down and dropped it right in front of him, knocking his bacon to the floor.]

M: Màigé   jiàoshòu   qián yī   tiān jì   gěi   hālì

McGonagall   Professor   before one   day   send to   Harry

#(**zhè ge**)   **bāoguǒ**.

this classifier   package

'Professor McGonagall had sent the package the day before.'

(28) is a slight variation on (10) in which the encounter between the narrator and the boy is no longer disconnected from the classroom situation described in the first sentence. Our

consultants report that (28) is acceptable with a bare noun. (29) is a variant on example (26) where we have introduced the package in a sending situation that is disconnected from the receiving situation. Our consultants report that (29) requires the demonstrative.

The fact that there is a spatiotemporal contiguity restriction between the eventualities in the antecedent sentence and those in the bare noun sentence strongly suggests that the sentences need to have the same topic situation. The existence of this restriction can be interpreted as preliminary support for analyzing the definite interpretation of the bare noun in (26) as relying on uniqueness. Despite this preliminary support, this hypothesis faces three problems. The first is that it is incompatible with Jenks' condition *Index!*: given that an index could have been used in (26), *Index!* should have imposed its use, contrary to fact. This problem can still be overcome by giving up the principle, a move independently motivated by the German data where we saw that contexts involving familiarity do not always take the uncontracted definite. The second problem is more difficult to solve: the previous introduction of a referent does not guarantee its uniqueness in a given situation. One could try to solve this problem through the introduction of a further contextual restriction of the situation, but without an index to guide this restriction this seems quite hard. Finally, if we were to find a way to make examples like (29) comply with the uniqueness requirements of a weak definite, one would need to wonder why the minimally different example (2) in German does not. We do not see any clear way of solving problems 2 and 3 while maintaining that the definite interpretation of (26) relies on uniqueness rather than on familiarity. This leads us to our third hypothesis.

The third and final hypothesis we explore is that familiarity is assessed differently in Mandarin from the ways it is assessed in languages like English and German. We hypothesize there is an index at play in examples like (26) and we further hypothesize indices in Mandarin are directly

available only for anaphors that occur in sentences that have the same topic situation as the sentences their antecedents occur in. This accounts for the data in (10), (26), (28) and (29). We furthermore hypothesize that the availability of indices in German is not sensitive to situations but solely depends on previous mention in the text. This accounts for the contrast we find between German and Mandarin. The gist of this third hypothesis is that there are two types of strong definiteness environments, one in which familiarity is assessed at the level of the text as in German, and one in which familiarity is assessed at the level of situations as in Mandarin. To model the Mandarin data, we would then need to work out the interaction between the dynamics of the index and the dynamics of the resource situation, a move that is not necessary for the German data.

The third hypothesis makes the bare noun into the default weak and strong definite in Mandarin. The question this raises is what the role of the demonstrative is, in particular in view of the fact that Jenks provides evidence suggesting that demonstratives come with a special syntactic slot for indices. The important point to make here is that examples like (14) – repeated below as (30) – are part of a larger paradigm that also includes examples like (31) and (32):

(30) **M:** Wǒ   xǐhuān [nǐmen   zhèxiē guāi   háizi].
      I   like   you   these   good   children
      'I like you good kids.'

(31) **M:** Wǒ   xǐhuān [yòubiān   zhèxiē guāi   háizi].
      I   like   to the right   these   good   children
      'I like the good kids to my right.'

(32) **M:** Wǒ   xǐhuān [zuótiān   nàxiē   guāi   háizi].
      I   like   yesterday   those   good   children
      'I like the good kids we met yesterday.'

(31) and (32) suggest that the slot demonstratives come with is not specializing in indices but rather in spatio-temporally restricted parts of worlds or situations. Their role, thus, seems to be to access situations and the individuals that occur in them. It is, then, not surprising that they function as familiar definites and are obligatory in contexts in which the bare noun is proscribed: the demonstrative can establish reference to a situation and the individuals in it without having to rely on topic situation continuity. Under the assumption that the pronoun in (30) picks out an individual in a certain situation, (30) is nothing more than a special case of accessing situations and the individuals that occur in them.

Let us conclude. The main factual claim we have made in this paper is that bare nouns in Mandarin can be used anaphorically, *contra* Jenks (2018). Given that there remain obvious correspondences between contracted/uncontracted definites in German and bare nouns/demonstratives in Mandarin, this led us to a theoretical claim about definiteness, *viz.* that there are two types of strong definite environments. We hypothesized that the first is based on previous mention in the text and the second on previous introduction in the topic situation. The facts suggest that definiteness in German is not sensitive to this distinction, but that Mandarin is. Recent work by Meier suggests that fine-grained distinctions along the same lines might also be active in Zurich German (Meier 2019). Our third and final claim was methodological in nature: we have shown how even small applications of Translation Mining allow us to probe the nature of definiteness in a novel way and generate new perspectives that are complementary to those found in research based solely on native speaker elicitation.

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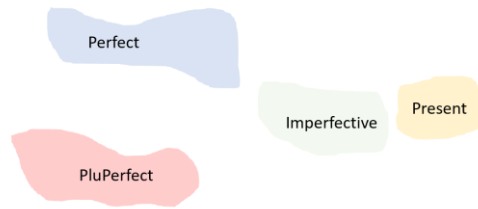
Figures

Figure 1: A stylized semantic map of tense use in French based on Chapter 1 of Camus' L'Étranger *and its translations to English, Spanish, Dutch, and German*
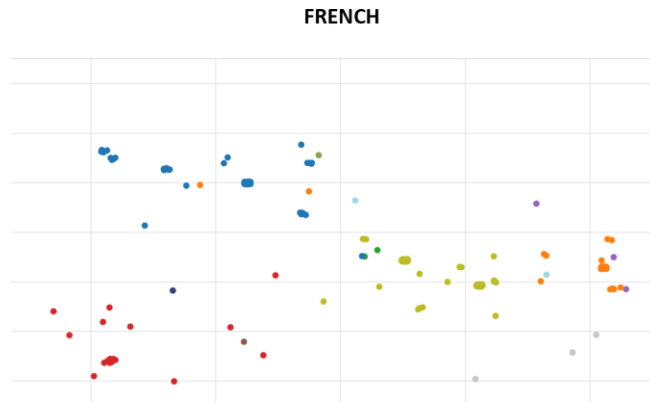

Figure 2: A non-stylized semantic map of tense use in French based on Chapter 1 of Camus' L'Étranger *and its translations to English, Spanish, Dutch, and German*

Figure 3: A context from Camus' L'Étranger *as stored in the online Translation Mining interface*
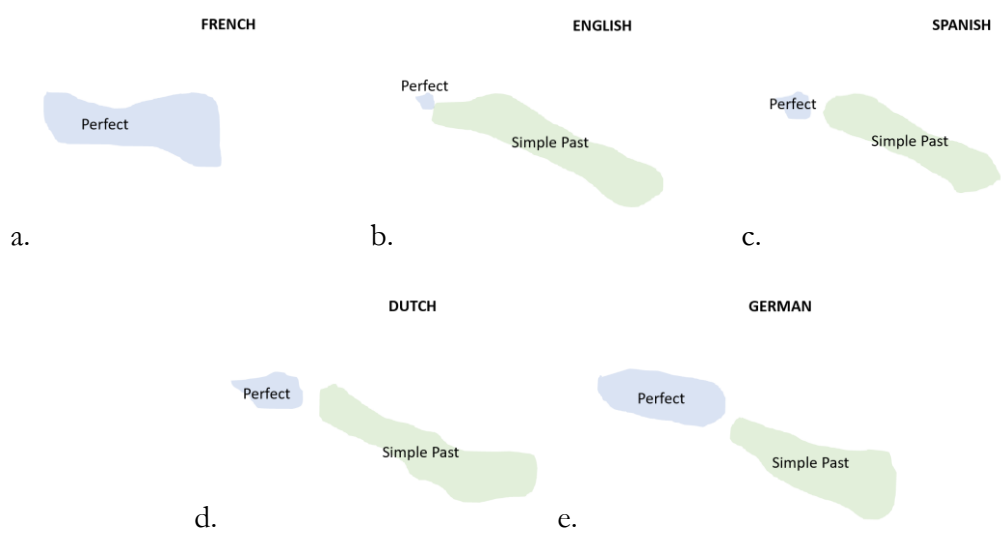
Figure 4: Stylized semantic maps of the Perfect and Simple Past uses based on Chapter 1 of Camus' L'Étranger *and its translations to English, Spanish, Dutch, and German*
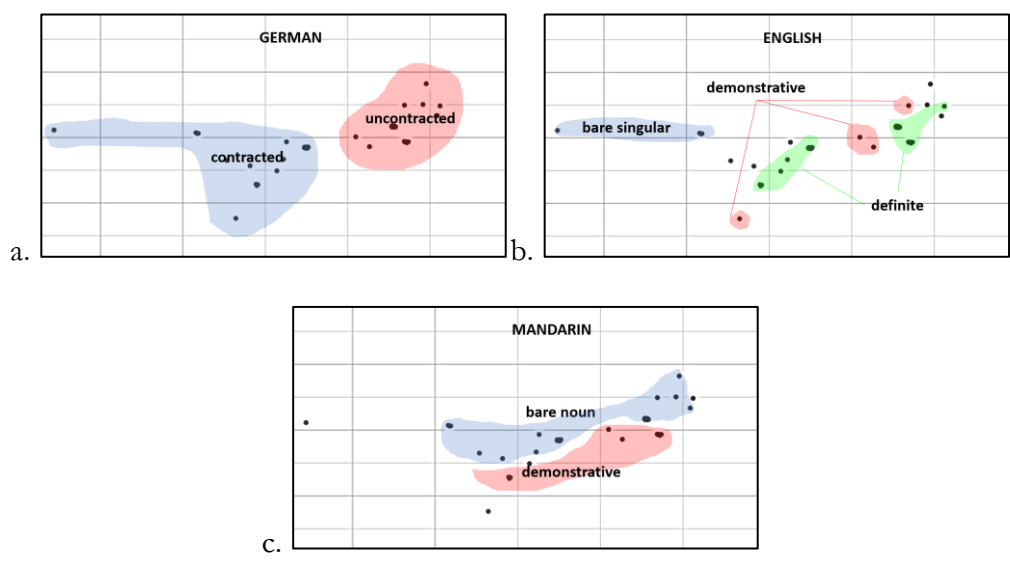

Figure 5: Semantic maps of the bare (singular) nouns, demonstratives, and (contracted and uncontracted) definites, based on data taken from Harry Potter (vol. 1) and its translations to German and Mandarin

Predicted implications   **_Do they hold?_**

Mandarin demonstrative   →   German uncontracted definite   yes

German contracted definite   →   Mandarin bare noun   yes

German uncontracted definite →   Mandarin demonstrative   no

Mandarin bare noun   →   German contracted definite   no

Figure 6: Overview of the unidirectional implications that should hold if the Mandarin bare vs. demonstrative

opposition were parallel to the German contracted vs. uncontracted opposition

Appendix: Mandarin examples with characters

(9) （#那/这个）台湾（的）总统很生气。

    (#Nà / zhè ge) táiwān (de) zǒngtǒng hěn shēngqì.

    that / this classifier Taiwan('s) president very angry

    'The president of Taiwan is very angry.'

(10) 教室里坐着一个男生和一个女生。我昨天遇到#（那个）男生。

    Jiàoshì lǐ zuò-zhe yī gè nánshēng hé yī gè

    classroom in sit-ASP one classifier boy and one classifier

    nǚshēng. Wǒ zuótiān yùdào #(nà gè) nánshēng.

    girl I yesterday meet that classifier boy.

    'There are a boy and a girl sitting in the classroom. I met the boy yesterday.'

(14) 我喜欢你们这些乖孩子。

    Wǒ xǐhuān nǐmen zhèxiē guāi háizi.

    I like you these good kids

    'I like you these good children. ('I like you good kids.')'

(21) '佩妮，我决不让他们任何人进这栋房子。'

    Pèinī, wǒ juébù ràng tāmen rènhérén jìn zhè dòng fángzi.'

    Petunia I not have they anyone enter this classifier house

    'I'm not having one in the house, Petunia!'

(22) 但是，关于那个神秘物件，他们惟一能够确定的只是它的长度有两英寸。如果没有更多线索，是不可能猜到它是什么东西的。

    Dànshì, guānyú nà gè shénmì wùjiàn, tāmen wéiyī nénggòu

    but, about that classifier mysterious object they only can

    quèdìngde zhǐshì tāde chángdù yǒu liǎng yīngcùn.

    be sure just its length have two inches.

    Rúguǒ méiyǒu gèngduō de xiànsuǒ, shì bù kěnéng cāi dào

    If not have more de clue be not possible guess out

    tā shì shénme dōngxī de.

    it be what thing de

    'But as all they knew for sure about the mysterious object was that it was about two inches long, they didn't have much chance of guessing what it was without further clues.'

(23) 哈利抬眼看着这个巨人。

    Hālì tái yǎn kàn-zhe zhè ge jùrén.

    Harry raise eye look-ASP this classifier giant

    'Harry looked up at the giant.'

(24) '我想我们可以带他到动物园去，'佩妮姨妈慢吞吞地说，'……然后把他留在车上 ……'

    'Wǒ xiǎng wǒmen kěyǐ dài tā dào dòngwùyuán qù,'

    'I think we could take him to zoo go,'

    pèinī yímā màn tūn tūn de shuō, '…ránhòu bǎ tā liú zài

    Petunia Aunt slowly DE say, '...then BA him leave in

    chē shàng…'

    car on…'

    'I suppose we could take him to the zoo.' Aunt Petunia said slowly, '... and leave him in the car...'

(25) 弗农姨父怒冲冲地给邮局、奶厂打电话找人说理。佩妮姨妈正好把二十四封信都塞

到食品粉碎机里搅得粉碎。

Fú nóng yífu   nù chōngchōng de   gěi   yóujú,   nǎi chǎng dǎdiànhuà
Vernon Uncle furious   DE   to   post office   dairy make call

zhǎo   rén   shuōlǐ.   Pèi nī yímā   zhènghǎo   bǎ   èrshísì
find   someone   complain   Petunia Aunt   just   BA   twenty four

fēng   xìn   dōu   sāi dào shípǐn fěnsuì jī   lǐ   jiǎo   dé   fěnsuì.
Classifier letter   all   insert food processor   in   shred   to   pieces

'While Uncle Vernon made furious telephone calls to the post office and the dairy trying to find someone to complain to, Aunt Petunia shredded the letters in her food processor.'

(26) 它们扑扇着翅膀刚刚飞走，又有一只猫头鹰携来一封信，扔在包裹上面。

Tāmen pūshan-zhe   chìbǎng gānggāng fēi   zǒu,   yòu   yǒu   yī   zhī
They   flutter-ASP   wings   right   fly   away,   and   have   one classifier

māotóuyīng   xié   lái   yī   fēng   xìn,   rēng   zài bāoguǒ shàngmiàn.
owl   bring   come   one   classifier letter   throw   to parcel   on.

'They had hardly fluttered out of the way when another owl dropped a letter on top of the parcel.'

(27) 他回过头来看着巨蟒，也对它眨了眨眼。

Tā   huí-guò   tóu   lái   kàn-zhe   jù   mǎng, yě   duì   tā
he back-ASP   head   to   stare-ASP   huge   snake too   to   it

zhǎ-le-zhǎ   yǎn.
wink-ASP-wink eye.

'He looked back at the snake and winked, too.'

(28) 教室里有一个男孩和一个女孩。我进教室打了男孩。

Jiàoshì   li   yǒu   yī gè   nánhái hé   yī   gè   nǚhái.
classroom   in   have   one classifier   boy   and   one classifier   girl

Wǒ   jìn   jiàoshì   dǎ le   nánhái.
Wǒ   enter   classroom   hit-ASP   boy

'There were a boy and a girl in the classroom. I entered and hit the boy.'

(29) 麦格教授前一天寄给哈利#（这个）包裹。

Màigé   jiàoshòu   qián   yī   tiān   jì   gěi   hālì
McGonagall   Professor   before   one   day   send   to   Harry

#(zhè   ge)   bāoguǒ.
this   classifier package

'Professor McGonagall had sent the package the day before.'

(30) 我喜欢你们这些乖孩子。

Wǒ   xǐhuān nǐmen zhèxiē   guāi   háizi.
I   like   you   these   good   children

'I like you good kids.'

(31) 我喜欢右边这些乖孩子。

Wǒ   xǐhuān yòubiān   zhèxiē   guāi   háizi.
I   like   to the right   these   good   children

'I like the good kids to my right.'

(32) 我喜欢昨天那些乖孩子。

Wǒ   xǐhuān zuótiān   nàxiē   guāi   háizi.
I   like   yesterday   those   good   children

'I like the good kids we met yesterday.'