

# No exhaustivity for the Mandarin NPI *shenme*

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## Abstract

Our main goal in this work is to refute empirically the claim that the Mandarin *negative polarity item* (NPI) *shenme* ‘a/some or other’ is exhaustive. This claim has been made recently in Chierchia and Liao (2015), who argue that *shenme* carries a positive  $\Sigma$ -feature, predicting behavior akin to exhaustive NPIs such as *any*. We show that exhaustivity leads to a number of erroneous expectations about the distribution and interpretation of *shenme*. First, we show that *shenme* is attested in a wider range of nonveridical contexts than *any*. Then we point out a number of asymmetries between *shenme* and exhaustive NPIs (English *any*, Mandarin *renhe*), and free choice items (Greek *opjodhipote*). Unlike these, *shenme* does not receive exhaustive readings with universal modals, it remains ungrammatical with subtriggering and in supplementary contexts, and it never receives generic readings. These asymmetries illustrate that *shenme* and exhaustive NPIs such as *any* represent different types of NPIs— and though both are licensed in negative and nonveridical contexts, the distribution of the exhaustive NPI is further constrained in ways that *shenme*’s distribution isn’t. We argue that *shenme* is interpreted with *referential vagueness* (cf. Giannakidou and Quer 2013), rather than exhaustivity. The upshot of our discussion is that not all NPIs are exhaustive, and that no sufficient understanding of NPI sensitivity can be achieved if we do not take this fact into consideration.

## Keywords

exhaustivity; free choice items; *shenme* ‘a/some or other’; negative polarity items (NPIs); nonveridicality; referential vagueness; anti-specificity; dependent variable

## 1 Exhaustive and non-exhaustive NPIs

In the literature on negative polarity items (NPIs), one finds pronouncements that *all* NPIs are exhaustive. Recently, for instance, Chierchia (2006, 2013) claims that, in contrast to ordinary or plain indefinites, “with NPIs and FCIs [free choice items] we *have to exhaustify*” (Chierchia 2013:8, emphasis in the original).

Exhaustivity makes sense for NPIs such as *any*, which admittedly receive exhaustive, universal like readings (at least by implicature; Giannakidou 2001). Another exhaustive polarity item is the *free choice item* (FCI), found in languages such as Greek, Spanish, Korean and Mandarin, among others. Exhaustivity is typically marked in both NPI and FCI either with morphological or prosodic means—for instance Krifka’s 1995 distinguishes emphatic (exhaustive) and non-emphatic *any*, Giannakidou and Yoon (2014) distinguish Greek and Korean emphatic (exhaustive) and non-emphatic (non-exhaustive) NPIs (see also Hoeksema 2010).

At the same time, non-exhaustive NPIs have been documented in a number of languages, e.g. Greek, Korean, Salish (Giannakidou 1998; Giannakidou and Quer 2013; Giannakidou and Yoon 2014; Haspelmath 1997; Matthewson 1996, among others; see Giannakidou 2011 for a fuller overview of the languages that have non-exhaustive NPIs). Non-exhaustive NPIs often are typically narrow scope anti-specific existentials, paraphrasable with *or other* as in ‘some or other’, and lacking the universal-like readings of free choice *any*. Non-exhaustive NPIs are narrow scope existentials because of their NPI status, convey *referential vagueness* (Giannakidou and Quer 2013), and tend to appear in contexts that are *nonveridical* (Giannakidou

1998).<sup>1</sup> Greek *kanenas*, Korean *rato*-NPI (Giannakidou and Yoon 2014), and Dutch *ooit* (Hoeksema 1999) are well-studied non-exhaustive NPIs.

In this paper, we ask the question of whether the Mandarin NPI *shenme* is, or is not, an exhaustive NPI. As the title of our article suggests, we will argue that it is not. *Shenme* belongs to the well known class of *wh*-indeterminates, and is used both as a question word and NPI (Li 1924; Ding 1961; Lü 1982; Huang 1982; Cheng 1991, 1994; Li 1992; Lin 1996; among others), see (1) and (2). NPI *shenme* is excluded from affirmative veridical sentences (Li 1992; Lin 1996), shown in (3).

- (1) *Yuehan zuotian mai-le shenme shu (ne)?*  
 John yesterday buy-PERF what book Q  
 ‘What kind of books did John buy yesterday?’
- (2) *Yuehan zuotian mei-you mai shenme shu.*  
 John yesterday not-have buy NPI book  
 ‘John didn’t buy books yesterday.’
- (3) \**Yuehan zuotian mai-le shenme shu.*  
 John yesterday buy-PERF NPI book  
 Intended: ‘John bought a book yesterday.’

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<sup>1</sup> Nonveridicality is defined in terms of truth: a propositional operator *F* is veridical, iff *Fp* entails *p*; otherwise *F* is nonveridical (cf. Giannakidou 1997, 1998; Giannakidou and Zwarts 1999, Zwarts 1995). Episodic past and present sentences are veridical and rule out NPIs; but epistemic modal sentences, questions, imperatives, and negative sentences, which can all license NPIs, are nonveridical. We do not discuss the formal details further as they have been known from previous literature.

Besides negation, NPI *shenme* is attested in the expected nonveridical contexts such as the protasis of a conditional (Cheng 1994; Lin 1996, 1998), the complementizer of which may be covert see (4a). It also appears in bare conditional clauses (treated as *donkey* sentences; Cheng and Huang 1996; Lin 1999); more contexts will be reviewed later. As we see, NPI *shenme* is translated as *some or other*, and contrasts with *any*.

- (4) a. (*Ruguo*) *ni you shenme wenti, jiu lianxi wo.*  
 if you have NPI question then contact I  
 ‘If you have a (=some or other/#any whatsoever) question, contact me.’
- b. *Yuehan you shenme shu, wo jiu kan shenmeshu.*  
 John have NPI book I then read NPI book  
 ‘If John has a (=some or other/#any whatsoever) book, I will read it.’

We use *whatsoever* as a handy paraphrase of exhaustivity, and it is not appropriate for *shenme*. In Greek, both the NPI *kamia* and the FCI *opjodhipote* can appear (Giannakidou 1997, 1998), and *whatsoever* is fine with the FCI.

- (5) *An exis kamia erotisi, pes mou.*  
 if have.2SG NPI questions tell me  
 ‘If you have a (=some or other) question, please tell me.’
- (6) *An exis opjadhypote erotisi, pes mou.*  
 if have.2SG FCI questions tell me  
 ‘If you have any question whatsoever, please tell me.’

The whatsoever reading surfaces in Mandarin not with *shenme*, as we saw, but with the exhaustive NPI *renhe* ‘any’ (cf. Giannakidou and Cheng 2006).

- (7) (*Ruguo*)      *ni*    *you*    *renhe*            *wenti*,            *jiu*    *lianxi*    *wo*.  
if                    you    have    any                    question            then    contact I  
‘If you have any question whatsoever, then contact me.’

So, we appear to have two NPI-paradigms in Mandarin: one with *some or other* reading (*shenme*, like Greek *kamia*), and another one with exhaustive *whatsoever*, reading (*any*, Mandarin *renhe*). Chierchia calls *any* ‘mixed’ *NPI/FCI*. Cheng and Giannakidou (2013) also attribute to the Mandarin NPI *renhe* exhaustivity status. We will call this type of NPI *exhaustive NPI*.

Both *shenme* and *renhe* can appear in the scope of *dou*, which itself has been analyzed as an exhaustivity marker (Giannakidou and Cheng 2006), maximality marker (Xiang 2008), or universal quantifier (Cheng 1991 among others). We will not discuss the *dou* construals here, since they blur the difference between *shenme* and *renhe*. In the examples above, it is the exhaustivity difference (*whatsoever* reading) between *renhe* and *shenme* emerged *without dou*. Regardless of how exactly the contribution of *dou* is approached, it is a marker of exhaustivity, and in its absence we can detect whether an item is inherently exhaustive as *renhe*, or not, like *shenme*.

The above-illustrated very basic data already lead to the generalization that *shenme* does not belong to the group of exhaustive NPIs. Nevertheless, Chierchia and Liao (2015), in a recent paper, claim that *shenme* is exhaustive. In making this claim,

they do not undertake an empirical comparison between truly exhaustive items (exhaustive NPIs such as *any* and *renhe*, FCIs) and *shenme*. In our paper, we will do exactly that: we compare meticulously *any/renhe* to *shenme*, and demonstrate that *shenme* is *not* exhaustive.<sup>2</sup>

Crucially, what is at stake is not simply the proper characterization of *shenme*, which, by itself, is of course a very important task. More broadly, what is at stake is whether NPI-hood, as a grammatical phenomenon, is simply the property of exhaustifying, as the Chierchia program would have it – or not. The Chierchia position, in other words, comes with a *no variation* position. This position contrasts with the *variation* approach to polarity (Giannakidou 1998; Giannakidou and Yoon 2014; see Giannakidou 2011 for an overview), where NPIs can be exhaustive, or non-exhaustive. Our paper shows the no variation position to make a large number of empirically incorrect predictions, and can therefore not be maintained as a general program for NPIs.<sup>3</sup>

We proceed as follows. Section 2 briefly introduces the position that *shenme* is exhaustive based on Chierchia and Liao's typology (2015). Our goal is not to address

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<sup>2</sup> The fact that Mandarin already has the exhaustive NPI *renhe*, already suggests that is highly unlikely that it will have a second NPI, exactly the same with respect to this property. In the large number of languages studied (e.g. in Haspelmath 1997, Giannakidou 2011) nothing of this sort has been observed.

<sup>3</sup> More global criticisms, e.g. against covert *only* and the exhaustivity can be found in Geurts (2009, 2010, 2013), Giannakidou (2011), Giannakidou and Quer (2013). Here we focus on the inability of exhaustivity to account for the nature of *shenme*-NPIs.

the whole system of Chierchia and Liao, but only the aspect of it that concerns *shenme*. Section 3 discusses in more detail the distributional and interpretational asymmetries between *shenme* and exhaustive items. Section 4 presents more evidence in favor of non-exhaustivity in *shenme*, drawing on adult language use and language acquisition. Section 5, finally, offers an analysis of *shenme*, modeled after Greek *kanenas* and Korean *rato-NPI*, as a non-exhaustive, referentially vague NPI that contains a dependent variable (Giannakidou 1998; J Lin et al. 2014; Giannakidou and Quer 2013). This account offers a better explanation of the distribution and interpretation of *shenme*, explains its similarity with the Greek and Korean NPIs, and allows us to better connect its dual status as a question word and NPI.

## **2 The exhaustivity proposal for *shenme***

Following Chierchia's earlier ideas about *any*, Chierchia and Liao (2015) attempt an extension to *shenme*. *Any* is argued to introduce scalar and domain alternatives (see also Kadmon and Landman 1993; Krifka 1995). It carries a  $\Sigma$ -feature that needs to be checked by a covert EXH-operator (O) (equivalent to *only*) via syntactic feature checking. When this O applies to a proposition *p*, exhaustification is triggered, leading to a reading of *p* such that only *p* is true and all stronger alternatives are false. These assumptions generate *any* as an NPI with free choice readings.

Chierchia and Liao argue that *shenme* is like *any*: it introduces scalar and domain alternatives, and is also subject to a covert O, i.e., represented as  $O_{DA-SA}$ . This accounts for its NPI-status. They also posit a typology of indefinites based on the interaction between two syntactic features: a *wh*-feature ([WH]) and an exhaustive feature ([ $\Sigma$ ]). In their typology, *all* NPIs are exhaustive, i.e., they all bear [+ $\Sigma$ ]. So

does *shenme*. To explain its function as a question word, which *any* lacks, the authors claim that *shenme* carries an unconstrained *wh*-feature ([u-WH]).

An overview of the system is given below; *shenme* and some English examples are put in the cell according to their features assumed by Chierchia and Liao’s system.

|                    | [u-WH]        | [-WH]-only    | [+WH]-only |
|--------------------|---------------|---------------|------------|
| [u- $\Sigma$ ]     |               | <i>a/some</i> |            |
| [+ $\Sigma$ ]-only | <i>shenme</i> | <i>any</i>    | <i>who</i> |
| [- $\Sigma$ ]-only |               |               |            |

Table 1: Types of NPI-indefinites in Chierchia and Liao<sup>4</sup>

The unconstrained *wh*-feature explains why *shenme* appears as a question word, and in non-*wh* environments as an NPI.<sup>5</sup> [+ $\Sigma$ ] on *shenme*, on the other hand, posits

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<sup>4</sup> The above is adapted from Chierchia and Liao (2015: (59)). Logically speaking we expect a type of indefinite that has a negative  $\Sigma$ -feature. However, this feature is not included in the original typology in CL. To provide a complete picture of how their system looks like, we add a column headed by “[- $\Sigma$ ]-only”.

<sup>5</sup> Notice, however, that it is unclear what the *wh*-feature is. Chierchia and Liao seem to identify it with being a question word, but this cannot be sufficient. The Greek FCI *opjosdhipote*, e.g., has a *wh*-feature (*pjos*) but is not used as a question word (Giannakidou 2001; Giannakidou and Cheng 2006). If *wh*-feature means ‘used as a question word’, morphological *wh*- is collapsed into interrogative *wh*, and this leads to overgeneralization. If all Mandarin *wh*-words bear [u-WH], similar behaviors are



exhaustivity akin to *any* and FCIs. Positing [+ $\Sigma$ ] on *shenme* predicts it to be exhaustive like *any*. We show next in more detail that this prediction is confronted with a number of empirical challenges.

### **3 *Shenme* is a non-exhaustive NPI appearing in nonveridical contexts**

J Lin et al. (2014) argue that *shenme* requires nonveridicality for licensing (see also Cheng and Giannakidou 2013, who show that this is the case for *renhe* as well). On the basis of what has been reported in the literature, J Lin et al. provide a systematic overview of the distribution of *shenme* (2014: Table 1). *Shenme* appears in the whole array of nonveridical environments, including DE-contexts.

The sensitivity to nonveridicality echoes earlier claims, e.g. Li (1002: 134): “the truth value of the proposition is not positively fixed in a definite manner”; Lin’s claim that *shenme* appears when the existence of a referent satisfying its description given by the context is not entailed, i.e. the *Non-Entailment-of-Existence Condition* (Lin 1998:230). Since questions are also nonveridical environments, the nonveridical approach captures easily *shenme*’s appearance as a question word. Overall, *shenme* is a superweak NPI according to Zwarts’ typology (1998) (J Lin et al. 2014). Greek NPIs such as *kanenas* and Korean *rato*-NPIs fall under this class as well.

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predicted, but Cheng and Huang (1996), Lin (1996, 1999) showed the contrary. Giannakidou and Cheng (2006) also show the *wh*-FCI *na-ge* to differ substantially in distribution from *shenme*. It seems thus more reasonable to view grammaticalization of *wh*-forms into NPIs along different paths, not fully derivable from *wh*-feature.

As a superweak NPI that requires nonveridicality, *shenme* is excluded from factive contexts, e.g., in the scope of a factive predicate, as shown below:

- (8) \**Wo zhidao Yuehan mai-le shenme shu.*  
 I know John buy-PERF NPI book  
 Intended: ‘I know that John bought a/some book(s).’

Moreover, *shenme* does not survive with *only*, unlike *any*: *Only John bought any books*. In this, the Mandarin NPI is again on a par with Greek *kanenas*, as shown:

- (9) \**Zhiyou Yuehan mai-le shenme shu.*  
 only John buy-PERF NPI book  
 Intended: ‘Only John bought a (=some or other) book.’

- (10) \**Monon o Yanis aghorase kanenavivlio.*  
 only the John bought.3SG NPI book  
 Intended: ‘Only John bought a (=some or other) book.’

*Only* rules out *shenme/kanenas*, but not *any* (and see more discussion of the Greek data in Giannakidou 1998, 2006). The contrast between *any* and *shenme/kanenas* is impossible to understand in the Chierchia and Liao system where *shenme* bears [+Σ] like *any*, and this feature alone renders it an NPI.

In this section, we undertake a detailed comparison between *shenme* and *any*, as we promised at the beginning. Our strategy will be the following. First, in section 3.1.

we look at nonveridical contexts and show that in these contexts, *any* is further constrained by the *plausibility* of the exhaustive reading. *Shenme/kanenas* do not have such limitation, suggesting that the nature of polarity sensitivity in *any* and *shenme/kanenas* cannot be the same. In other words, [+Σ] cannot derive the contrasting behaviors of *kanenas/shenme* NPIs and *any* in nonveridical contexts.

In section 3.2, we strengthen this conclusion by examining in detail the contrasting behaviors of *shenme* and *any/renhe* with respect to several well known exhaustivity tests, such as: (non)occurrence with free choice inferences in generic contexts or in epistemic or deontic modal environments (in 3.2.1); subtriggering (in 3.2.2); impossibility of supplementary use (in 3.2.3); plausibility with universal modal verbs (in 3.2.4). The overall conclusion from our detailed comparison will confirm our initial observation that *shenme* is not an exhaustive NPI.

### 3.1 *Shenme* vs. *any*: exhaustivity constraints in nonveridical contexts

Here we review a number of nonveridical contexts in which *shenme* is allowed to appear whereas *any* is not. These contexts mainly involve modal environments incompatible with exhaustive, universal-like interpretation. These environments block *any*; but *shenme* is fine because it lacks the exhaustive interpretation.

**a. Epistemic/deontic modal contexts.** As reported by Li (1992) and Lin (1998), *shenme* is attested in epistemic or deontic modal contexts, as illustrated below. *Any*, on the other hand, is impossible there as can be seen from the translations.

(11) *Yuehan*      *zuotian*      *haoxiang*      *mai-le*      *shenmeshu*.

John            yesterday      probably      buy-PREF      NPI      book

‘John probably bought a (=some or other/#any) book yesterday.’

- (12) *Yuehan bixu gen wo jie shenme shu.*  
 John must from I borrow NPI book  
 ‘John must borrow a (=some or other/#any) book from me.’

*Shenme* exhibits a similar pattern as Greek *kanenas*-NPIs, which are attested in modal contexts as well (Giannakidou 1997, 2011) with the same *some-or-other* reading of referential vagueness; Giannakidou and Yoon 2014 show the same for Korean *rato*-NPIs). In using *shenme*, the speaker intends to talk about book-borrowing or book-buying, instead of the rhetorically stronger exhaustive version of *any book whatsoever*. This, in contrast, is the reading that *any* receives in modal contexts, and because the reading is implausible, *any* is ruled out. If *shenme* had an exhaustivity feature like *any*, it is unclear why we would get the observed contrast above.

**b. Imperatives.** Li (1992) and Lin (1996, 1998) observe that *shenme* appears in imperatives.<sup>6</sup> This is shown in the example below.

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<sup>6</sup> Lin claims that in imperatives, *shenme* is only grammatical with the quantifier *dian* (lit. ‘a little bit’) (see (10)). However, as the following example illustrates, an imperative with *shenme* is also possible in the absence of *dian*.

- Ni qu mai ben shenme shu kan ba.*  
 you go buy CL NPI book read PAR  
 ‘Go to buy a (=some or other/#any) book to read!’

- (13) *Lai chi dian shenme binggan ba!*  
 come eat CL NPI cookie PAR  
 ‘Eat a (=some or other/#any) cookie!’

Though imperatives are nonveridical, hence licensing environments for NPIs, *any* can be odd in them if the free choice reading is not licit, as shown above. But *shenme* is fine, receiving the *some or other* reading. Again, this is similar to the Greek NPIs, illustrated below.

- (14) *Fae kanena glyko!*  
 eat NPI cookie  
 ‘Eat a (=some or other/#any) cookie!’

In contexts of free choice reading, the FCI *opjodhipote* is employed:

- (15) *Fae opjodhipote glyko!*  
 eat FCI cookie  
 ‘Eat any cookie whatsoever!’

The Greek FCI and *any* induce a reading where the addressee comes to the dessert table with a great appetite, and the speaker invites her to try every option if she wishes to. In such a context, exhaustivity makes sense. In the imperative, by contrast, *shenme* or *kanena* create invitations to eat some cookies or other. In a context where some cookies are off limits (say, the ones to the left of the table) only the NPI versions of

the imperative are good. This again suggests that *shenme/kanenas*, unlike *any*, are not required to exhaust all options.

**c. Uncertainty contexts, habituals, futures.** The literature observes that *shenme* can appear in epistemic uncertainty contexts (with the progressive aspect in Mandarin), habituals and futurity contexts (Li 1992; Lin 1996, 1998; J Lin et al. 2014; Xie 2007). This is demonstrated next. Contexts that express epistemic uncertainty license the Mandarin NPI as well, e.g., in the complement of a nonveridical predicate meaning ‘guess’.

- (16) *Yi-ge sangyin dichen de nanren zhengzai chang shenme ge.*  
 one-CL low-voiced man PRG sing NPI song  
 ‘A man with a low voice is singing a (=some or other/#any) song.’
- (17) *Yuehan jiu hao kan shenme kehuan xiaoshuo.*  
 John just love read NPI science-fiction  
 ‘John is fond of reading (some or other/#any) science fiction.’
- (18) *Yuehan yao qu mai ben shenmeshu kan.*  
 John will go buy CL NPI book read  
 ‘John will go to buy a (=some or other/#any) book to read.’
- (19) *Wo cai Yuehan mai-le shenme shu.*  
 I guess John buy-PREF NPI book  
 ‘I guess that John bought a (=some or other/#any) book.’

Notice again the contrast with *any*. Because the *whatsoever* reading does not make sense in these contexts, *any* is ruled out. *Shenme*, on the other hand, is fine and again expresses the *some or other* reading. In all the contexts above, the speaker does not know the identity of the song or the book, and is not able to identify what the referent is. This is the typical flavor of anti-specific, referentially vague indefinites.

### 3.2 *Shenme* is not exhaustive: four more diagnostics

Exhaustivity, as we saw, licenses universal-like free choice readings, and there are four widely used diagnostics in the literature, all based on *any*. These diagnostics are: (a) appearance in modal and generic contexts with *whatsoever* reading; (b) the possibility of subtriggering; (c) the possibility of supplementary use; (d) implausibility with universal modal verbs (deontic as well as epistemic). In this subsection, we show that exhaustive NPIs like *any* and *renhe* pass all these tests – but Greek *kanenas* and Mandarin *shenme* do not.

#### 3.2.1 *Shenme* lacks free choice inferences

This is a generalization of the point we already made previously, only we now look at cases where both *any* and *shenme* are admitted. *Any*'s exhaustivity produces free choice inferences in modal contexts. *Shenme*, on the other hand, does not. We start with illustrating the contrast with *if*-clauses, *before*-clauses, and imperatives.

- (20) a. *If John bought anything (whatsoever), he will let me know.*  
b. *John may/will borrow any book (whatsoever).*  
c. *Pick any card (whatsoever).*

- (21) a. *Ruguo ni you shenme wenti, jiu lianxi wo.*  
 if you have NPI question then contact I  
 ‘If you have a (=some or other/#any) question, then contact me.’
- b. *Yuehan keyi /xiang he wo jie shenmeshu.*  
 John may /will with I borrow NPI book  
 ‘John may/will borrow a (=some or other/#any) book from me.’
- c. *Tiao zhang shenme pai ba!*  
 pick CL NPI card PAR  
 ‘Pick a (=some or other/#any) card!’

Notice now the exhaustive NPI *renhe* (see e.g., Giannakidou and Cheng 2006) in (24), which allows exhaustive reading, just like *any*:

- (22) a. *Ruguo ni you renhe wenti, jiu lianxi wo.*  
 if you have any question then contact I  
 ‘If you have any questions (whatsoever), then contact me.’
- b. *Yuehan keyi /xiang he wo jie renhe shu.*  
 John may /will from I borrow any book  
 ‘John may/will borrow any book (whatsoever) from me.’

The exhaustive reading also surfaces with genericity: *Any cat (whatsoever) hunts mice*. Crucially, the generic reading is not available for *shenme*, which patterns with Greek NPIs that do not express genericity either (Giannakidou 1997):



(23) \**Sheme mao zhua laoshu.*  
 NPI cat hunt mouse  
 Intended: ‘Any cat (whatsoever) hunts mice.’

(24) \**Kamia gata kinigaei pontikia.*  
 NPI cat hunt.3SG mice  
 Intended: ‘Any cat (whatsoever) hunts mice.’

We should not expect this contrast if *shenme* and *any* bear the same  $\Sigma$ -feature.

### 3.2.2 *Shenme* does not allow subtrigging

In veridical contexts such as perfective past, both *any* and *shenme* are ungrammatical as observed with all NPIs. However, *any* improves when modified by a relative clause – a phenomenon known as *subtrigging* (LeGrand 1975). In subtrigging, *any* is interpreted quasi-universally quantifier (see discussion in Dayal 1997, Giannakidou 2001, Horn 2005). *Shenme* and *kanenas*, crucially, are unacceptable in subtrigging:

(25) *John bought any book \*(that he could find).*

(26) \**Yuehan mai-le (ta neng zhao-dao de) shenme shu.*  
 John buy-PERF he can find-PERFREL NPI book  
 Intended: ‘John bought any book he could find.’

(27) \**O Janis aghorase kanena vivlio (pou vrike stin aghora).*  
 the John bought.3SG NPI book REL found.3SG in-the market  
 Intended: ‘John bought any book that he found on the market.’

The impossibility of subtriggering with *shenme* or *kanenas* again challenges their assimilation to *any*. *Shenme* and *kanenas* substantially differ from the exhaustive NPI *renhe* and the Greek FCI *opjodhipote*, which allow subtriggering as expected:

(28) *Yuehanmai-le*            \*(*ta neng zhao-dao de*) *renhe shu*.  
 John buy-PERF    he    can    find-PERF    REL    any    book  
 ‘John bought any book he could find.’

(29) *O Janis aghorase opjodhipote vivlio* \*(*vrike stin aghora*).  
 the John bought.3SG FCI            book    found.3SG            in-the market  
 ‘John bought any book that he found on the market.’

Positing exhaustivity for *shenme/kanenas* type of NPIs predicts similar behavior to *any*/FCIs contrary to fact.

### 3.2.3 *Shenme* cannot be used in supplementary contexts

Items bearing [+Σ] exhibit also supplementary use (Horn 2005); but non-exhaustive NPIs do not. This use also gives rise to a universal-like reading. Regardless of what the proper analysis is, it suffices to see the asymmetry between *any*/FCIs, on the one hand, and non-exhaustive NPIs like Greek *kamia/shenme* on the other.

- (30) a. *Pick a card, any card.*  
 b. *If you have a question, any question, you can contact me.*

- (31) *Pare mia karta, opjadhipote /#kamia karta!*  
 take.imper.2SG one card, FCI /#NPI card  
 ‘Take a card, any card!’

*Shenme* follows the Greek NPI-pattern. We do not see how this difference can be explained if *any* and *shenme* both carry [+Σ]. Rather, we see again *any* aligning with *renhe* and not with *shenme*:

- (32) *Tiao yi-zhang ka ba, renhe /#shenme ka.*  
 pick one-CL card PAR any /#NPI card  
 ‘Pick a card, any card.’
- (33) *Ruguo ni yudao mafan, renhe /#shenme mafan, jiu lianxi wo.*  
 if you meet matter any /#NPI matter then contact I  
 ‘If you have a problem, any problem, just contact me.’

Clearly, it is not *any* and *shenme* that form a natural class, but *renhe* and *any*. *Shenme* again exhibits behaviors distinct from both.

### 3.2.4 *Shenme* is fine with universal modal verbs

Exhaustive NPIs and FCIs are known to be implausible with universal modal verbs (Giannakidou and Quer 2013; Menéndez-Benito 2010); but *shenme* and Greek NPIs are fine, as we show below:

- (34) a. #*Ariadne must marry any lawyer.* [English]  
 b. #*I Ariadne prepi na pandrefti opjondhipote dikigoro.* [Greek]  
 the Ariadne must SUBJ marry FCI lawyer  
 Intended: ‘Ariadne must marry any lawyer.’  
 c. #*Ta bixu dei jia gei renhe lvshi.* [Mandarin]  
 she must necessarily marry for any lawyer  
 Intended: ‘She must marry any lawyer.’
- (35) *I Ariadne prepi na pandrefti kanena dikigoro.* [Greek]  
 the Ariadne must SUBJ marry NPI lawyer  
 ‘Ariadne must marry some lawyer or other (to get out of financial trouble).’
- (36) *Ta bixu dei jia gei shenme lvshi.* [Mandarin]  
 she must necessarily marry for NPI lawyer  
 ‘She must marry some lawyer or other (to get out of financial trouble).’

The reason why *any*, *renhe* and FCIs are not allowed with universal modals is that they license a universal reading, which is implausible. The exhaustive NPIs convey *exhaustive variation* (Giannakidou 2001; Giannakidou and Cheng 2006; Giannakidou and Quer 2013), or an overt universal quantifier (Aloni 2011; Menéndez-Benito 2010), depending on the analysis. The exact implementation is not crucial here, as both predict implausibility that Mary marries every doctor. In contrast, *kanena/shenme* are grammatical, receiving existential interpretation. The sentences with the NPIs are true in a context where the family is in dire financial situation, and Ariadne must save the family by marrying a rich guy, e.g., a lawyer.

The contrastive behaviors of exhaustive NPIs, and the *shenme/kanenas* NPI can be replicated with epistemic universal modals. Consider the context in which the speaker is talking with John, noticing that he is well informed about Mary’s illness:

- (37) a. #*She must have talked to any doctor.* [English]  
 b. #*Prepi na milise me opjondhipote giatro.* [Greek]  
 must SUBJ talk with FCI doctor  
 Intended: ‘She must have talked any doctor.’  
 c. #*Ta kending he renheyisheng tan-guo-le.* [Mandarin]  
 she must with any doctor talk-COML-PERF  
 Intended: ‘She must have talked to any doctor.’
- (38) a. *She must have talked to a doctor.* [English]  
 b. *Prepi na milise me kanenan giatro.* [Greek]  
 must SUBJ talk with NPI doctor  
 ‘She must have talked with some or other doctor.’  
 b. *Ta kending he shenme yisheng tan-guo-le.* [Mandarin]  
 she must with NPI doctor talk-COML-PERF  
 ‘She must have talked to some or other doctor.’

We see again the meaning difference: *any, renhe* and FCIs create a statement akin to John having talked to every doctor, which is implausible given that hospitals have many doctors and that, in order to be informed about someone’s illness, you don’t need to talk with *all* doctors. The NPI statements, on the other hand, simply say that

Mary talked to some doctor unspecified to the speaker (see Giannakidou and Yoon 2014 for more discussion of similar data in Korean, and Giannakidou and Quer 2013).

### 3.3 Summary

In summary, our *shenme* specific and cross-linguistic data so far show that positing [+ $\Sigma$ ] in both *shenme* and *any* makes a number of unsubstantiated predictions regarding their distributions and interpretation with respect to exhaustive inferences. In contrast to *any*, *shenme* appears to be a non-exhaustive NPI, and is systematically ruled out in contexts that call for exhaustive inferences. The detailed data presented in this section lead us to conclude that *shenme* behaves like a member of the class of non-exhaustive NPIs such as Greek *kanenas*. Unlike *shenme*, Mandarin *renhe* – being exhaustive – patterns indeed with *any*. In the next section, we offer more evidence from corpus data collected in both adult language use and child language speech.

### **4 More evidence for *shenme*'s status as an NPI different from *any* (and *renhe*)**

This section provides more evidence supporting *shenme*'s status as a non-exhaustive NPI. The data also illustrate that *shenme* requires nonveridicality as a licensing property. First, we present a comparative overview of how *any*, *renhe*, and *shenme* are distributed in naturalistic language use. The corpus data confirm what we have concluded: *shenme* is a different type of NPIs than *any*, exhibiting a broader distribution in the whole array of nonveridical contexts (rather than just DE-contexts). After the corpus data, we turn to language acquisition, and report recent findings (cf. J Lin et al. 2014, submitted), illustrating that two distinct learning pathways are attested

for *any* and *shenme*. Thus the acquisitional data also confirm that *any* and *shenme* do not represent the same class of NPIs.

In order to obtain a quantitative overview of the distribution of the three NPIs, we employed two corpora for data collection: the British National Corpora (BNC; 2007) for *any* and the Chinese Internet Corpora (CIC; Sharoff 2006) for *shenme* and *renhe*.<sup>7</sup> The BNC contains more than 110 million tokens and the CIC circa 280 millions. For the current research aim, however, we only randomly selected near 1000 utterances containing *any*, *shenme* or *renhe*, which were analyzed for their semantic property, e.g., in the scope of a sentential negation, or imperfective aspects. Frequency results in this respect are summarized in the Table 1 below.

The data clearly show distinct distributional patterns of the three NPIs attested in adult English and Mandarin. They also confirm the by now expected parallel between *any* and *renhe*, as opposed to *shenme*. *Any* and *renhe* are most frequently attested in various negative contexts, e.g., in the scope of a sentential negation ( 44.4% , and 56.1% respectively). But *shenme* is most frequently used as a question word, namely 49.1% of the time. Although *shenme* is systematically attested in the scope of negation as well (19.4% of the time) the difference with *any* and *renhe* is significant ( $p=.000$ ).<sup>8</sup>

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<sup>7</sup> Only the spoken corpora of the BNC were selected for data collection.

<sup>8</sup> (Due to the presence of observed frequencies smaller than zero in some cells, we employed a Fisher's Exact Test instead of a chi-square test to examine the significance of the difference between the distributions of the three NPIs. The semantic context of *in the scope of sentential negation* turns out to be a significant contributor to the significant difference between the distributions of *any*, *renhe* and *shenme*, given the standardized residuals of the relevant cells.

| Semantic contexts  | <i>any</i><br>(BNC) | <i>renhe</i><br>(CIC) | <i>shenme</i><br>(CIC) |
|--|---------------------|-----------------------|------------------------|
| In the scope of sentential negation                              | 461 (44.4%)         | 523 (56.6%)           | 183 (19.4%)            |
| With FC inferences   | 178 (17.1%)         | 135 (14.6%)           |                        |
| In the scope of <i>without</i>                                   | 17 (1.6%)           |                       |                        |
| In the scope of negative indefinites                             | 34 (3.3%)           |                       |                        |
| In the scope of negative verbs like <i>deny</i> or <i>refuse</i> |                     | 20 (2.2%)             |                        |
| In the scope of <i>few</i> , <i>hardly</i> , etc.                | 7 (0.7%)            |                       |                        |
| In the restriction of a universal quantifier                     | 1 (0.1%)            | 210 (22.8%)           | 69 (7.3%)              |
| In conditional clauses (incl. <i>donkey</i> sentences)           | 76 (7.3%)           | 29 (3.1%)             | 58 (6.2%)              |
| In <i>before</i> -clauses  | 6 (0.6%)            | 3 (0.3%)              |                        |
| In the scope of <i>only</i>                                      | 9 (0.9%)            |                       |                        |
| In the complement of emotive verbs                               | 2 (0.2%)            |                       |                        |
| In (embedded) polar questions <sup>9</sup>                       | 245 (23.6%)         | 3 (0.3%)              | 18 (1.9%)              |
| In (embedded) WH-questions <sup>10</sup>                         | 3 (0.3%)            |                       | 3 (0.3%)               |
| In epistemic/inferential/subjunctive contexts                    |                     |                       | 97 (10.3%)             |
| In imperfective aspects  |                     |                       | 34 (3.6%)              |
| In the complement of non-factive predicates <sup>11</sup>        |                     |                       | 16 (1.7%)              |
| In imperatives   |                     |                       | 2 (0.2%)               |
| In (embedded) WH-questions as WH-word                            |                     |                       | 463 (49.1%)            |
| <b>Total</b>   | <b>1039</b>         | <b>923</b>            | <b>943</b>             |

Table 2: Distributions of *any*, *shenme* and *renhe* in adult language use

The data reported here moreover give rise to another similarity of *any* and *renhe*, namely that they both evoke FC/exhaustive inferences around 15% of the time (in

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<sup>9</sup> In Mandarin, the category of polar questions also includes X-NEG-X questions. These contain an X-NEG-X construction, absent in generic polar questions in Mandarin. In the X-NEG-X, X refers to a lexical element of any morphological category, e.g. a noun, a verb or an adjective and NEG can be realized by either *bu* or *mei*, both of which are sentential negative markers in Mandarin. X-NEG-X questions license the NPI *shenme* (Cheng 1994; Lin 1998)

<sup>10</sup> In Mandarin, this category only involves instances in which *shenme* appears in a *wh*-question but is not used as a question word. An example is given below.

(i) *Ta zenneng you shenme xiangfa ne?*  
 he how have *shenme* idea Q-marker  
 ‘How come he would have any ideas?’

<sup>11</sup> This category includes intentional verbs such as *xiang(yao)* ‘want to’ or *dasuan* ‘plan’ and also non-factive predicates like *yiwei* ‘think’ or *juede* ‘think’.



particular: *any* 17.1% and *renhe* 14.6%, with no significant difference).<sup>12</sup> But such inferences are impossible with *shenme*, as we already showed in Section 3.2 by means of the four diagnostics. We get extra confirmation from the corpus data. We also see that only *shenme* is systematically attested in nonveridical contexts that are not DE, including questions. All together, *shenme* is attested 67% of the time in such environments.

The corpus data presented in Table 2 can also be presented in the following graph, in which darker colors stand for stronger negative contexts. There it becomes even more obvious that *shenme* is a type of NPI distinct from *any* or *renhe*:

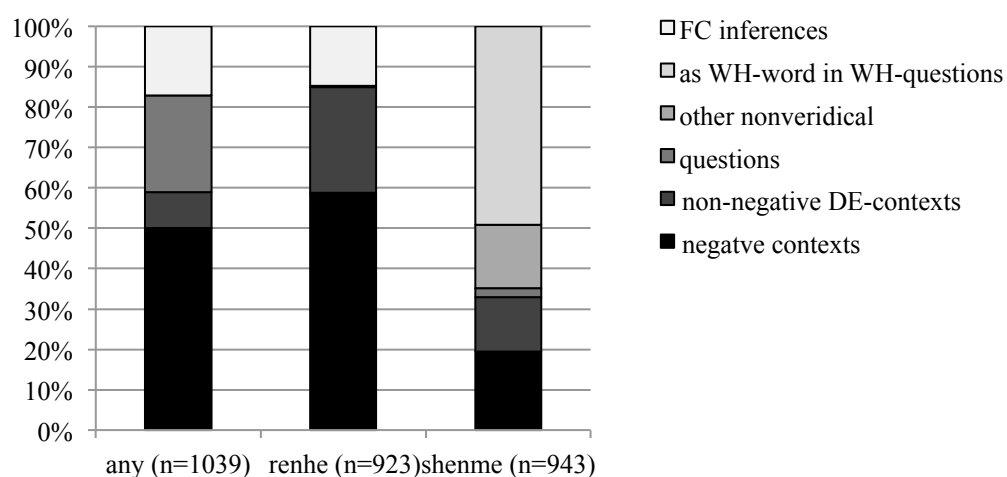


Figure 1: Comparison of distributions of *any*, *shenme* and *renhe* in adult language use

<sup>12</sup> The standardized residuals obtained with the cells of *with FC inferences* show that the relevant semantic context is not a significant contributor to the significant difference between the distributions of the three NPIs. See further footnote 11.

*Any* and *renhe* – when they are not interpreted as having FC (exhaustive) inferences – appear substantially attested in DE-contexts, i.e., indicated by darker colors, whereas *shenme* is more often attested in non-negative nonveridical contexts, which are represented by lighter colors. This significant distributional difference between *any* and *renhe*, on the one hand, and *shenme*, on the other, provides strong evidence for our position that *shenme* is different from *any*.

We now move to language acquisition. We follow here a recent cross-linguistic study on the acquisition of NPIs (J Lin et al. submitted). Their hypothesis is that if *any* and *shenme* represent the same kind of NPIs, for instance that they are both exhaustive it is highly likely to observe similar developmental pathways during the acquisition. However, corpus data collected from spontaneous child speech in the CHILDES database (MacWhinney 2009) show the opposite. Consider first the graph below, in which the distribution of *any* and *shenme* in child language development is presented (adapted from J Lin et al. submitted: Figure 11 and 12). Again, darker colors stand for stronger negative environments.

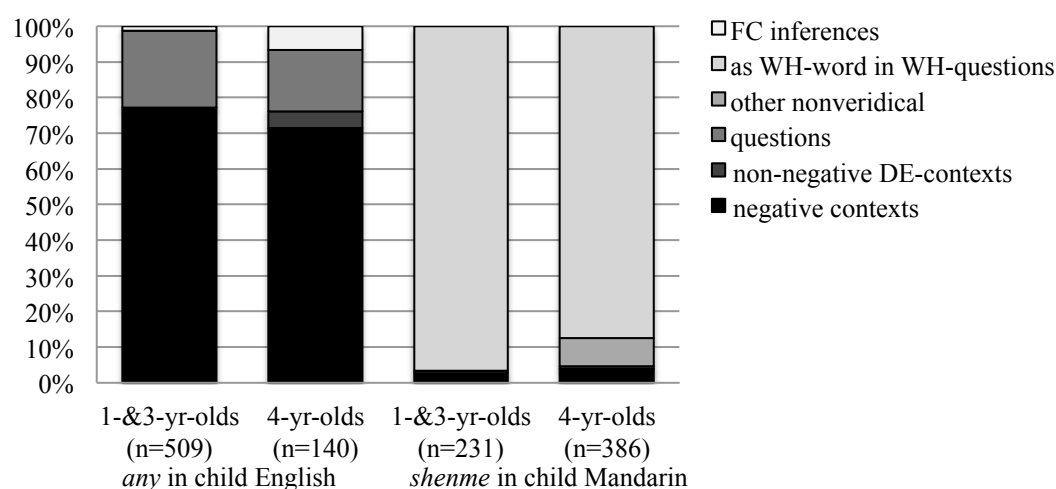


Figure 2: Distribution of *any* and *shenme* in child language development

As the graph demonstrates, in both child English and child Mandarin two distinct stages are attested in the acquisition of the NPIs, both with age four as a watershed.<sup>13</sup> For *any*, J Lin et al. (submitted) find that children start out using the NPI either in the scope of a sentential negation or in polar questions while also using DE-contexts that are neither negative nor polar questions approximately after the age of four, such as conditional clauses. After this age, children are also capable of using *any* as having a free choice interpretation. Mandarin children's acquisition of *shenme*, on the other hand, exhibits a different learning pattern: they start out using *shenme* almost only in *wh*-questions as expressing a question meaning but switch to a broader analysis of the NPI such that they also use *shenme* in a variety of nonveridical contexts that are not *wh*-questions later on, for instance progressives, or uncertainty contexts.

In sum, the distinct acquisitional patterns attested for *any* and *shenme*, and the corpus data we presented in this section, support the conclusion that the two NPIs do not belong to the same class (J. Lin et al. submitted). Hence assimilation of the two in terms of exhaustivity is not justified.

### **5 *Shenme*: dependent variable, referential vagueness**

If *shenme* is not exhaustive, then what is it? Following the analysis of non-exhaustive NPIs such as *kanenas*, we sketch now an analysis for *shenme*. As we show in this

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<sup>13</sup> See J Lin et al. (2014; submitted) for an elaborate explanation of the attested learning pathways under a conservative widening learning hypothesis (Van der Wal 1996).

section, this analysis better captures *shenme*'s status as an NPI, its transition from a question word to a broad NPI, and its anti-specific interpretation. We rely on two ingredients: *referential vagueness* and *dependent variable* (Cheng and Giannakidou 2013; Giannakidou and Cheng 2006; Giannakidou and Quer 2013; Giannakidou and Yoon 2014). But we first want to give some basic background, necessary for framing the semantics of *shenme* in the appropriate way.

Giannakidou argues for two lexical sources of NPI-hood. This is the *variation* approach that we mentioned at the beginning. The two lexical sources are *scalarity* and *referential deficiency*. Scalar NPIs are always marked (minimally, with intonation), and trigger exhaustivity. *Shenme/kanenas* are not such NPIs.

Referential deficiency is what we call *anti-specificity*.<sup>14</sup> Giannakidou and Quer (2013) distinguish two kinds of anti-specificity: exhaustive (leading to free choice) and *referential vagueness*, which is non-exhaustive. *Shenme* and Greek NPIs exhibit the latter. Referentially vague indefinites are used typically in contexts “where the speaker does not have a particular individual in mind, is not sure about it” (Giannakidou et al. 2011: 38), or if the speaker simply feels that identity does not

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<sup>14</sup> Other labels have also been used in the literature for anti-specific indefinites. They have been called ‘low referential’ (Partee 2008), ‘epistemic’ (Alonso-Ovalle & Menéndez-Benito 2013; Jayez & Tovená 2006), ‘modal’ (Alonso-Ovalle & Menéndez-Benito 2010), ‘irreferential’ (Jayez and Tovená 2006), ‘epistemically non-specific’ (Haspelmath 1997), and ‘extremely non-specific’ (Farkas 1998). The terms ‘modal’ and ‘epistemic’ have been popular, but given that specificity is also an epistemic constraint, ‘epistemic’ is confusing. Similarly, ‘modal’ collapses referentially vague indefinites and FCIs, which are also modal (Giannakidou 2001, Giannakidou and Cheng 2006). It is thus preferable to use the term *anti-specific* (or perhaps *ignorance*) indefinites as more accurate and theory-neutral alternatives.

matter. As Alonso-Ovalle and Menéndez-Benito (2013) put it, the speaker is ignorant about ‘knowing who’, and Haspelmath mentions that “with non-specific phrases, whose referents are not identifiable in principle, the question of identifiability by the speaker does not even arise” (Haspelmath 1997: 45). This is exactly the meaning we get with *shenme* and *kanenas*.

To see this effect of referential vagueness, observe what happens when the NPIs are used in a legitimate nonveridical context, followed with a specific, fixed value.

(39) *Wo xiang jian ge shenme jiaoshou.* [Mandarin]

I want to meet CL NPI professor

‘I want to meet a (=some or other) professor.’

a. *#Jiushi na-ge ren.*

namely that-CL guy

‘#Namely that guy.’

b. *#Jiushi Yuehan.*

namely John

‘#Namely John.’

c. *#Jiushi zhexue xi de tou.*

namely philosophy department GEN head

‘#Namely the head of the Philosophy Department.’

(40) *Thelo na sinandiso kanena glosologo.* [Greek]

want.1SG SUBJ meet.1SG NPI linguist

‘I want to meet a (=some or other) linguist.’

- a. *#Ine aftos o kyrios ekei.*  
 is.3SG this the man there  
 ‘#It’s that man over there.’
- b. *#To onoma tu ine Bill.*  
 the name his is.3SG Bill  
 ‘#His name is Bill.’
- c. *#Ine o proedros tu tmimatos filosofias.*  
 is.3SG the professor of-the department.GEN philosophy.GEN  
 ‘#He is the head of the Philosophy Department.’

These contexts all ascribe to the speaker’s prior knowledge of the value or identity of the referent. How we identify the referent does not matter – we use the tests employed in Aloni and Port (2006) and Giannakidou and Quer 2013, and they all create infelicitous NPIs. In the examples above, the speaker uses the NPI, but s/he has some professor or linguist in mind; this creates a problem, suggesting that the NPI needs unspecified value.

Anti-specificity is exactly this phenomenon of the indefinite not being able to receive a specific value. An anti-specific indefinite is the opposite of a specific indefinite— which, in almost every analysis, is said to associate with particular value in the mind of the speaker. Anti-specific indefinites convey epistemic indeterminacy, and are devices that the speaker uses when being in a state of not having a specific value in mind. According to Giannakidou and Quer 2013 and Giannakidou and Yoon 2014, free choice is also a case of anti-specificity, a case in which identity doesn’t matter. Free choice is exhaustive in order to convey precisely this ‘doesn’t matter’

inference. Referential vagueness, on the other hand, is not exhaustive anti-specificity. In this case, as the term suggests, the speaker is in a state of vagueness about the identity of the referent, and vagueness means that it is unclear what the value is. This means that the referentially vague indefinite will require a model for interpretation where there is a choice of at least two possible values.

This is captured in the following definition by Giannakidou and Quer (2013). Referential vagueness is a felicity condition of minimal variation tied to the speaker:

(41) *Referential vagueness*

- (i) A sentence containing a referentially vague indefinite  $\alpha$  will have a truth value iff:  $\exists w_1, w_2 \in W(\text{speaker}): \llbracket \alpha \rrbracket^{w_1} \neq \llbracket \alpha \rrbracket^{w_2}$ ; where  $\alpha$  is the referentially vague indefinite.
- (ii) The worlds  $w_1, w_2$  are epistemic alternatives of the speaker:  $w_1, w_2 \in W(\text{speaker})$ , where  $W(\text{speaker})$  is the speaker's belief state, the worlds compatible with what she believes/knows.
- (iii) The speaker does not know what the actual value is (vagueness).

Referential vagueness imposes variation (clause (i)) on the possible values for the indefinite, and an epistemic indeterminacy for the speaker: s/he is considering at least two, and possibly more, differing values for the indefinite. The worlds in the definition above are *identity alternatives* (Dayal 1997; Giannakidou 2001), which are worlds identical in everything but the value they assign to an indefinite. Clause (iii) is an inference derived from (i): if the speaker considers at least two possibilities, then s/he must be in a state of vagueness and cannot know which value – if any at all (we

consider in the end the case of negation) – will verify the formula containing a referentially vague indefinite. *Shenme/kanenas* can be used only if this condition is satisfied. Free choice can be viewed as a strengthening of the vagueness condition, i.e., with universal quantification over the i-alternatives, something that can be explained via focus and FCI-marking, because all FCIs are focalized, as opposed to referential vague items that are typically non-emphatic (see more details in Giannakidou and Yoon 2014).

Referential vagueness blocks *shenme* with *najiushi* ‘namely’, which necessarily introduces a specific value of a referent, as is illustrated in the example below (adapted from Liao 2011: (9)).

(42) *Yuehan keneng chi-le shenme dongxi, #najiushi baozi.*

John probably eat-PERF NPI thing namely bun

‘John has probably already eaten something, #namely a bun.’

Giannakidou and Quer also show that in contexts with exactly one value, referentially vague indefinites cannot be used. Importantly, referential vagueness also characterizes indefinites that are *not* NPIs. A typical example is *algún* in Spanish. Observe the parallel in the examples below.

(43) *Tengo que leer un artículo de algún profesor.*

must that read one article of some or other professor

‘I have to read an article of some professor or other.’

*#Esaquel señor de allí, pero no sé cómo se llama.*



is this man of there, but not know.1SG how he is-named.3SG

‘#It’s that guy over there, but I don’t know his name.’

(44) *Tengo que quedar con algún profesor.*

must that meet with some or other professor

‘I have to meet with *some professor or other*’

#*Se llama Bill Ladusaw.*

he is-named. Bill Ladusaw

‘#His name is Bill Ladusaw.’

*Algún* is not an NPI, i.e. it occurs with simple past positive sentences.

(45) *Ha llamado algún estudiante.*

has called some or other student

‘Some *student or other* called.’

Given that non-NPIs can also be referentially vague, it becomes obvious that referential vagueness alone is not sufficient to derive the NPI status of *shenme*. We therefore argue, again following the analysis of *kanenas*, that *shenme*—in addition to being subject to referential vagueness—also contains a dependent variable.

Importantly, it has already been argued for Mandarin FCIs that they contain dependent variables: Cheng and Giannakidou (2013) and Giannakidou and Cheng (2006) claim that Mandarin FCIs, including *renhe* which has free choice inferences, have dependent variables of type *i*). Here we generalize this position to argue that Mandarin NPIs also contain dependent variables, of the type *e*.

What does it mean for a variable to be dependent? This question is discussed in detail in Giannakidou (1998, 2011) and Giannakidou and Quer (2013), and we will offer only a brief outline here. A dependent variable is one whose assignment function is constrained: it cannot get a value from the context, unlike regular, non-dependent variables that can. Giannakidou defines the dependent variable relevant for the NPI as *non-deictic* (Giannakidou 2011):

(46) Dependent variable (*non-deictic*)

A variable  $x_d$  is dependent iff the  $x_d$  cannot be interpreted as a free variable.

The dependent variable is called *non-deictic* because the particular constraint has to do with inability to be interpreted as a free variable. This is formalized by using a designated variable:  $x_d$ . In the indefinite theory of existentials, we would have to say that dependent indefinite has a variable that cannot be closed under Heim's (1982) *text level* existential closure (which is closer to what has been proposed in Giannakidou 1997, 1998). Such variables will not be able to be used in veridical sentences because they cannot receive a value there; they would have to be interpreted as free variables or by text level closure, since there is no operator. Under negation existential closure can apply.

In other words, a dependent variable is restricted to contexts where there is an operator it can be bound by, or can be in the scope of. This explains why a dependent variable always appears to be narrow scope and the item containing it is non-referential. By claiming that the *kanenas* NPI (Giannakidou 1998: 70–71, 139–140) and *shenme* NPI contain a dependent non-deictic variable, we capture their need to be

licensed as a need to be in the scope of an operator – negation being one such operator along with the rest of the other nonveridical operators.

The dependent variable creates a semantico-syntactic dependency at the logical form, and leads to grammatical and not simply interpretative failure. In other words, the dependent variable is an element that establishes a syntactic dependency that is motivated semantically. This framework imposes an isomorphism between semantics (a dependent variable cannot remain free) and morpho-syntax (a dependent variable is a distinct syntactic object from a non-dependent variable). The dependent variable class includes NPIs and FCIs – but it is not meant for merely polarity items. Polarity insensitive items such as anaphoric or reflexive pronouns, distributivity markers (i.e., reduplicated indefinites in Hungarian, cf. Farkas 1998; see also Henderson 2012), the temporal variable of the subjunctive mood (temporal polarity in Giannakidou 2009), and as recently argued in Grano (2012), subjects of exhaustive control verbs such as *try* and *manage*, are all dependent variables. In the landscape of dependent variable, the NPI dependent variable is one that cannot be interpreted as a free variable.

Question word variables, crucially, are also dependent: they occur only as bound by the Q operators and are never free. They cannot be interpreted as free variables. Thus, once we acknowledge dependent variables as a class, the transition from question word to NPI seems simple. In fact, within dependent variables we predict such transitions to be common, as indeed they are with the class of *wh*-indeterminates.

*Shenme* thus contains a dependent variable of type  $e$ :  $x_d$ , on a par with *kanenas*. If this is the case, then it needs to be in nonveridical contexts because these contain operators where  $x_d$  can be bound. With negation,  $x_d$  is fine because existential closure applies under negation. However, a dependent variable has no privileged relation to

negation, we thus expect the more general sensitivity to nonveridicality. Our lexical entry for *shenme*, combining dependent variable with vagueness, is as follows:

(47) Denotation:  $\llbracket \text{shenme NP} \rrbracket = P(x_d)$ ; where  $x_d$  is a dependent; P is the NP predicate.

Presupposition: *shenme* has a presupposition of referential vagueness below:

- (i) A sentence containing *shenme* be defined (i.e. will have a truth value) only if:  $\exists w_1, w_2 \in W(\text{speaker})$ :  $\llbracket \alpha \rrbracket^{w_1} \neq \llbracket \alpha \rrbracket^{w_2}$ ; where  $\alpha$  is *shenme*;
- (ii) The worlds  $w_1, w_2$  are epistemic alternatives of the speaker.
- (iii) The speaker does not know which value is the actual value (vagueness).

In this analysis, it is far from surprising that we have a transition from a *wh*-word to a non-referential, anti-specific NPI. After all, such a transition represents an extension of contexts in which a dependent variable can be bound: not just *wh*-questions, which are a typical nonveridical environment, but the whole array of nonveridical contexts.

In contrast to Chierchia and Liao's hypothesis (2015), our proposal accounts for the three desiderata for *shenme*: its NPI-status, its transition from a question word to an NPI, and its anti-specificity. We want to add that the extension from *shenme* as question word to dependent variable NPI is also evident in its acquisitional path.

As already presented in Section 4, children start out with using *shenme* as a mere question word but employ a variety of non-*wh* nonveridical contexts at the subsequent stage (cf. Figure 2). J Lin et al. (2014; submitted) interpret this learning path as representing an acquisitional process in which children start with a narrow assumption of *shenme* being a mere question word but switch to a reanalysis of it being a broad NPI due to the presence of a dependent variable later on. This means that children

acquire *shenme*'s NPI-status via first analyzing it as a *wh*-word. When children make this initial analysis of *shenme* as a question word, they have already acquired that it contains a dependent variable.<sup>15</sup> After this initial binary classification (a variable can be either dependent or non-dependent, cf. Giannakidou 2011), children proceed to extend the distribution of the dependent variable to other contexts in which it can be bound, namely all kinds of nonveridical contexts.

It is not clear to us that the Chierchia and Liao system can explain the observed transition in acquisition of *shenme*. In that system, the two features employed do not necessarily correlate, i.e. *shenme*'s [u-WH] does not necessarily entail that it must also be an NPI (which means bearing [+ $\Sigma$ ]) or vice versa. The extension of *shenme* from a mere *wh*-word to a broad NPI in acquisition would therefore merely be a coincidence, rather than a predicted outcome.

## **6 Conclusion: no exhaustivity for *shenme*, variation for NPIs**

In this paper, we presented detailed evidence that *shenme* is not exhaustive. Instead, *shenme* appears to belong to the class of non-exhaustive NPIs that have been identified in the literature. Like its Greek and Korean counterparts, *shenme* was

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<sup>15</sup> J Lin et al. (submitted) assume that when a child utters a *wh*-interrogative, s/he shares the same semantic analysis of a question word that is involved as their parents. For example, a child is assumed to analyze *what* as a dependent variable that cannot be assigned a fixed value in the discourse but introduces a set of possible edible things when s/he utters: "What did mama eat?" We do not see otherwise how the communication between children and adults could proceed or be successful.

shown to exhibit *referential vagueness*. Positing an exhaustive [+ $\Sigma$ ] feature for this kind of NPI, as proposed by Chierchia and Liao, makes systematically incorrect predictions about where *shenme* is expected to appear, and how it gets interpreted.

Following Giannakidou (1998, 2011) and Giannakidou and Quer (2013), we offered an analysis of *shenme* as an indefinite that contains a dependent non-deictic variable. The dependent variable unifies the two uses of *shenme*, namely as a question word and as an NPI, and connects well with the claim that Mandarin FCIs too contain dependent world variables (Cheng and Giannakidou 2013; Giannakidou and Cheng 2006). This further leads to the conclusion that both Mandarin NPIs (*shenme*, *renhe*) and FCIs (*wulun*) are characterized by nonveridicality just like in Greek.

Mandarin, thus, has two series of NPIs, an exhaustive one (*renhe*) and referentially vague one (*shenme*), it therefore realizes both manifestations of anti-specificity in the polarity system (like Greek and Korean, but unlike English). Importantly, the dependent variable approach to the Mandarin NPI offers a framing more consistent with the wide range of data we presented—and connects *shenme*'s use as a question word to its occurrence as an NPI, something that the Chierchia and Liao's account cannot do (since their two features [WH] and [ $\Sigma$ ] are completely independent). For Chierchia and Liao the extension of *shenme* from a *wh*-word to an NPI would therefore merely be a coincidence rather than a predicted outcome, as it is within the dependent variable analysis.

Finally, *shenme* is an important addition to the non-exhaustive NPI class, and challenges the idea that NPI-hood is only about exhaustification. This is perhaps the most important, big picture implication of the analysis proposed in this paper. Our detailed data, including the corpus data, show that the no variation position is

empirically untenable. We need to acknowledge the existence of NPIs whose polarity sensitivity has to do not with exhaustivity, but with constraints on dependent reference and anti-specificity. No sufficiently general understanding of polarity phenomena in language can be achieved if we ignore this class.

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