

# A critical assessment of exhaustivity for Negative Polarity Items

The view from Greek, Korean,  
Mandarin, and English

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**Abstract:** In some recent works on negative polarity, exhaustivity is posited as the single defining property of all negative polarity item (NPI) and free choice item (FCI) paradigms. Chierchia (2006; 2013), and Chierchia & Liao (2015) are the best-known implementations of this theory. They stipulate that **all** NPIs and FCIs must be exhaustified, and posit a covert *O(nly)* and a syntactic feature  $[+\Sigma]$  to derive exhaustification and licensing respectively. In this paper, I challenge the exhaustivity hypothesis and find it, after careful empirical investigation, to be inadequate to explain the distribution and interpretation of NPIs in Greek, Korean, and Mandarin, which have been described in the literature as non-exhaustive. We also find the theory to be unable to derive the actual distribution of *any* in nonveridical contexts. Analytically, the problems with exhaustification are twofold. First, the use of covert *O(nly)* fails to account for why NPIs are **licensed**. Licensing is a grammaticality condition, and in order to capture it the syntactic feature  $[+\Sigma]$  is stipulated, NPI-licensing thus amounting to checking the  $[+\Sigma]$  feature. The stipulation of  $[+\Sigma]$ , without a coherent characterization of its semantics, is a regression to a Klima-esque (1964) syntactic account, and faces precisely the challenges that that account faced. Second, for any variant of the Chierchia system to work for the data discussed here, the system built around it must posit additional *ad hoc* rules on a case-by-case basis. This produces a system with very little predictive power beyond each specific case because of the *ad hoc* nature of the rules posited. Our overall conclusion will be that the exhaustivity hypothesis, as formulated in the works discussed here, is a falsified, therefore unnecessary, hypothesis for NPIs.

**Keywords:** negative polarity items; free choice items; nonveridicality; exhaustification; non-exhaustive NPIs; referential vagueness; *only*; Greek; Korean; Mandarin; wh-indeterminates; diversity theory of NPIs

## 1. Introduction

In some recent works on negative polarity, exhaustivity is posited as the single defining property that all negative polarity item (NPI) and free choice item (FCI) paradigms. This view is perhaps most clearly expressed in (1):

- (1) **Exhaustivity-for-all thesis:** “in contrast to ordinary or plain indefinites, with NPIs and FCIs we **have to** exhaustify”. (Chierchia 2013, 8, emphasis in the original)

At first glance, (1) could be seen as a valiant attempt to unify what it means to be an NPI or a FCI, and as such it may seem desirable. It is, after all, necessary in science to try to find unifying principles for (often highly) complex phenomena, and it would be nice to be able to provide a uniform explanation for why an expression becomes an NPI or a FCI. The statement in (1), however, is a linguistic hypothesis, and linguistics is an empirical science with descriptive adequacy as its foundation; whether (1) is true or false, therefore, must be decided not based on what might be desirable or nice as a general consideration, but on the basis of empirical investigation of the specific sets of data for which the hypothesis is proposed.

In the program initiated by Chierchia (2006; 2013), (1) is stated axiomatically, i.e., it is stipulated as a true proposition that requires no empirical proof; and works following (1) simply adopt it. In the present paper, I will treat (1) as the hypothesis that it is, and inquire whether there is empirical evidence from actual NPI and FCI data to support it. My goal is to show that there are significant reasons to be skeptical about (1) as a unifying principle of NPIs and FCIs. (1), I will show, fails to survive empirical scrutiny, and can therefore **not** provide an adequate empirical basis for predicting the attested distribution of NPIs in Greek, Korean, and Mandarin Chinese. (1) also fails for English *any*, and is unable to capture the differences in meaning between Greek, Korean, and Mandarin NPIs, on the one hand, and *any*, on the other. For these reasons, I will conclude that (1) is a **falsified** hypothesis for NPIs.

One could argue, of course, that (1) holds for the NPIs at hand, despite substantial empirical evidence to the contrary, and even declare that we need not worry about the absence of empirical evidence for it. But if we downplay the role of empirical evidence in shaping our linguistic explanations, we are no longer engaged in the project of doing linguistic analysis; we are engaged, rather, in an ideological project about what polarity theories, and ultimately language itself, **ought to** look like, with, in my view ominous, disregard about what the phenomena **actually** are.

My arguments against the exhaustivity thesis will be empirical, but also analytical, i.e., having to do with the particular implementation proposed by Chierchia, and Chierchia and Liao (2015) for Mandarin. I will offer conceptual arguments against (1) having to do with the unlimited complexity of the theory produced. Greek and Korean indefinite NPIs have been described in the literature as non-exhaustive (Giannakidou & Yoon 2016), and contrast empirically in significant ways with the intended ex-

haustive NPI *any*. The Mandarin NPI *shenme*, likewise, has been categorized as “lacking existential import” (Lin 1996; 1998), and has been argued to be a **non-referential** NPI (Lin et al. 2014; Lin 2015). In this paper, we see that *shenme* behaves like Greek and Korean non-exhaustive NPIs and contrasts with *any* with respect to a number of diagnostics that the exhaustivity-for-all hypothesis is unable to predict.

The main analytical arguments against (1) go as follows. When we actually consider what it means to exhaustify, the Chierchia style implementation – based on the two covert devices of *O(nly)* and  $[+\Sigma]$  – is undesirable for a number of reasons. First, as it has been pointed out already (e.g., Geurts 2009; 2010), these devices are posited *ad hoc* without empirical evidence. Geurts, in fact, launches a more general argument that *O* is not necessary for implicature: there is no set of facts that are only derived by *O*, and that cannot be derived by the classical neo-Gricean framework. Second, while *O* bears the onus of exhaustification, it is itself not sufficient to derive NPIs in nonveridical environments that are not negative such as questions, the antecedent of conditionals, the scope of modal verbs, propositional attitudes of desire and future orientation, disjunctions, and imperatives. In these non-negative environments, the logic of the *O* argument simply will not work. Third, and perhaps most fatally, exhaustification via *O* is not enough to account for why NPIs are **licensed**. Licensing, as admitted also by Chierchia, is a grammaticality condition; and in order to capture it, Chierchia stipulates a syntactic feature  $[+\Sigma]$ . NPI-licensing then amounts to checking the  $[+\Sigma]$  feature. The actual account of NPI licensing, thus, in the theory built around (1), does not make use of *O*. One then wonders why *O* is needed at all. Finally, the stipulation of  $[+\Sigma]$  is a regression to a Klima-esque (1964) syntactic account, and faces precisely the challenges that that account faced.

Our overall conclusion will be that the program based on hypothesis (1) fails to predict the distribution of Greek, Korean, Mandarin NPIs, and *any*. One must add stipulations, specific to each of these NPIs, in order to derive the desired empirical patterns; and indeed there does not seem to be a limit to the complexity of the system, as it becomes evident in Chierchia & Liao (2015). This is, crucially, our conceptual worry. Given the actual empirical patterns of polarity, for any version or interpretation of (1) to hold, the system built around it must become highly unconstrained with a proliferation of covert entities and *ad hoc* rules for each specific NPI case. Putting aside, for the moment, the *ad hoc* character of these rules, the addition of specific rules for each NPI produces a theory that is in fact indistinguishable from one that posits different types of NPIs. Hence, from

this perspective, nothing is gained analytically by assuming (1). At the same time, the proliferation of covert entities and unlimited rules conflicts with Ockham's razor: *entia non sunt multiplicanda praeter necessitatem*. The phrase *praeter necessitatem*, 'beyond necessity,' has served linguistic theorizing well. The need to keep positing *ad hoc* rules in order to maintain exhaustivity for NPIs that stubbornly insist on being non-exhaustive, would lead most researchers to the conclusion that an alternative system that, by giving up (1), does not need such stipulative rules was superior. A theory acknowledging both exhaustive and non-exhaustive NPIs would therefore provide an empirically better grounded foundation and would be consistent with the Ockham's *necessitas*.

Such a theory has indeed been proposed in Giannakidou (1994; 1997; 1998; 2001; 2006; 2007; 2011; 2013); Giannakidou & Quer (2013); Giannakidou & Yoon (2016); Bernardi (2002); Zwarts (1993; 1995); Hoeksema (1999); Xherija (2014), among many others. According to this theory, the unifying property of all NPIs and FCIs is that they appear in the scope of nonveridical operators (the nonveridicality thesis); but they do so for possibly different reasons. While accepting a unified distributional criterion for all polarity items (namely that they are licensed by nonveridical operators), unlike (1), the nonveridicality thesis does not impose a single semantic core for all NPIs and FCIs, and allows for diverse (to use the term employed in Giannakidou 2011) semantics based on strictly defined, and empirically motivated, properties that render a given expression an NPI or an FCI. Chierchia, unfortunately, does not engage with the diversity aspect of this theory.

Given what is actually known about NPI distributions and semantic differences among them, there is no reason to believe that a unifying meaning of all NPIs and FCIs follows from the logic of polarity, or any logic or meta-principle for that matter. By insisting on a single semantic source for NPIs and FCIs, (1) becomes, as I cautioned in Giannakidou (2017), a Procrustean criterion for polarity that forces us to cut, stretch, or ignore data in order to make it work.

The discussion proceeds as follows. In section 2, I present the paradigms of NPIs to be discussed: Greek *kanenas*, Korean *rato*-NPIs, Mandarin *shenme*, and English *any*. We find them all in nonveridical contexts but they differ in meaning: the Greek, Korean, and Mandarin items lack the exhaustivity inference of free choice. These NPIs behave like **referentially vague** indefinites. In section 3, we discuss the issue of licensing by nonveridicality, responding to some critical discussion found in Chierchia (2013). We conclude that 'nonveridical' is indeed the proper characteriza-

tion of polarity contexts. In section 4, we focus on Chierchia's implementation of exhaustivity, and discuss its analytical shortcomings. We discover that *O* and [+Σ] fail to account for the distribution of NPIs in nonveridical contexts; they also fail to account for the appearance of *any* in the Linebarger contexts where there is no operator in the structure to check [+Σ]. Section 5, finally, presents a close empirical examination of the contrasts between indefinite NPIs in Greek, Korean, and Mandarin, on the one hand, and *any*, on the other, with respect to six widely used diagnostics. The contrasts are **not** predicted by any existing accounts based on (1).

## 2. Two kinds of NPIs in nonveridical contexts: referential vagueness versus free choice

Let us start with a basic description of the NPIs in discussion: English *any* (Klima 1964; Ladusaw 1980; Linebarger 1980, among numerous others), Greek *kanenas* (Giannakidou 1994; 1997; 1998; 2011), and Mandarin *shenme* (Li 1992; Cheng 1994; Lin 1996; 1998; Lin et al. 2014; Lin 2015). The Korean *rato*-NPI is shown to behave like the Greek *kanenas* in Giannakidou & Yoon (2016). (Albanian possesses an NPI identical to *kanenas* (Xherija 2014), but in order to keep the data manageable, I will not include Albanian data in what follows).

Observe the core cases in English, Greek, and Mandarin:

- (2) a. Nicholas did not see anybody. (English)  
b. \*Nicholas saw anybody.
- (3) a. Dhen idhe kanenan o Janis. (Greek)  
not saw NPI.ACC the Janis.NOM  
'Janis did not see anybody.'  
b. \*Idhe kanenan o Janis.  
saw NPI.ACC the Janis.NOM
- (4) a. Yuehan mei kanjian shenme ren. (Mandarin)  
Yuehan not see NPI person  
'John did not see anybody.'  
b. \*Yuehan kanjian le shenme ren.  
John see PERF NPI person

In (2)–(4), we see that *any*, *kanenas* and *shenme* are sensitive to the presence of negation: without it, they are ungrammatical. This is the key

criterion that renders them NPIs. *Shenme*, in addition, belongs to the class known crosslinguistically as **wh-indeterminates**, i.e., expressions that can be used either as NPIs as in (4), or as wh-words as in (5):

- (5) Yuehan zuotian mai-le shenme shu (ne)? (Mandarin)  
 John yesterday buy-PERF what book Q  
 ‘What (kind of) books did John buy yesterday?’

NPIs generally appear in the scope of negation, but also in the scope of expressions that are nonveridical but not negative e.g., in questions (*Did John see anybody? Who has ever been to Paris?*), with modal verbs and adverbs, in imperatives, disjunctions; we elaborate on the distribution later (see Giannakidou 1999; 2011 for an overview). In modal contexts, *any* receives the so-called free choice reading, indicated in (6) below with *almost*. *Almost* has been used as a test for FCI reading since Davison (1981), and regardless of what the actual analysis of *almost* is, the test successfully distinguishes between NPI and FCI readings of *any*. The Greek NPIs *kanenas*, *tipota* lack free choice reading, and the lexically distinct FCI *otidhipote* is used instead (Giannakidou 1997; 1998; 2001). We observe a similar pattern with the Mandarin *shenme* and the mixed NPI/FCI *renhe* (for a free choice component in *renhe* see Giannakidou & Cheng 2006; Cheng & Giannakidou 2013):

- (6) Sta genethlia tou o Janis bori (Greek)  
 in-the birthday his the John can  
 na fai sxedhon {otidhipote/#tipota}.  
 subj. eat.3SG almost FCI/NPI-thing  
 ‘On his birthday, John may eat almost anything.’
- (7) Shengri de shihou, Yuehan keyi chi renhe/#shenme dongxi. (Mandarin)  
 when is birthday John can eat FCI-thing/NPI-thing  
 ‘John may eat anything on his birthday.’

Lacking free choice, Greek and Mandarin NPIs are instead referentially vague, a reading rendered below as *some or other* (Giannakidou 1997; Giannakidou & Quer 2013):

- (8) O Nikolas bori na milisi me {kanenan/opjondhipote} fititi.  
 the Nicholas may SUBJ talk.3SG with NPI/FCI student  
 ‘Nicholas may talk to *some student or other*/any student.’

- (9) Mila me {kanenan/opjondhpote} fititi.  
 talk.IMP.2SG with NPI/FCI student.  
 ‘Talk to {some student or other/any student}!’

In other words, the NPI and FCI uses of *any* are distinguished lexically in Greek and Mandarin (and in many other languages, e.g., Spanish, Catalan, Hungarian, see Halm 2016); and Greek and Mandarin NPIs lack free choice in the context where *any* is interpreted with free choice. This immediately suggests that the Greek and Mandarin NPIs cannot be the same type of NPI as English *any*. In other words, the semantics of *kanenas/shenme* and *any* must be distinct.

More evidence that the Mandarin and Korean NPIs align with *kanenas* in modal contexts is given below (see Lin 1996; 1998; Lin et al. 2014; Giannakidou & Yoon 2016 for the original data):

- (10) Yuehan haoxiang mai-le shenme shu. (Mandarin)  
 John probably buy-PREF NPI book  
 ‘John probably bought a book (some book or other; I don’t know which book).’
- (11) Swuni-lul etise-rato po-myen kunye-eykey yaykihay-la. (Korean)  
 S.-ACC place.NPI see-if her-DAT talk-IMP  
 ‘If you see Swuni at *some place or other*, talk to her.’
- (12) Amwu sakwa-rato cipe-la. (Korean)  
 any apple.NPI take-IMP  
 ‘Take *some apple or other*.’
- (13) Nwukwu-rato oass ulswu iss-ta. (Korean)  
 person.NPI came possible-DECL  
 ‘It is possible that *some guy or other* came in.’

Giannakidou and Quer (2013) frame the discussion of referential vagueness and free choice in the concept of anti-specificity: referentially vague and free choice indefinites are both anti-specific, i.e., they express absence of referential intent (von Heusinger 2011) of the speaker. Referential intent is a foundational drive for specificity, narrowing down the domain of the indefinite to a single, fixed value; anti-specificity, on the other hand, Giannakidou and Quer argue, is inability to refer to a fixed value. This means that, for a felicitous use, there must be variation in possible values in the speaker’s mind. Anti-specific indefinites thus convey referential indetermi-

nacy, which comes about as ignorance or indifference of the speaker about the exact identity of the referent.<sup>1</sup>

Referential vagueness is the basic case of anti-specificity, i.e., the speaker has no particular individual in mind, and it lacks exhaustivity. This is captured in the requirement below, where we see a mere existential condition, i.e., that there be a choice of values available for the indefinite, and nothing more:

(14) Referential Vagueness as non-exhaustive variation (Giannakidou & Quer 2013):

A sentence containing a referentially vague indefinite  $\alpha$  will have a truth value iff:  
 $\exists w_1, w_2 \in W : \llbracket \alpha \rrbracket^{w_1} \neq \llbracket \alpha \rrbracket^{w_2}$ ; where  $\alpha$  is the referentially vague indefinite.

The worlds  $w_1, w_2$  are epistemic alternatives of the speaker. Given that an unembedded sentence is interpreted with respect to the speaker, the relevant worlds for assessment come from the speaker's belief state, the set of worlds compatible with what she believes/knows. A referentially vague indefinite is thus "epistemic", just like the specific indefinite, which has the presupposition (or, felicity condition, Ionin 2006) that there be one value only (see also Fodor & Sag 1982, Schwarzschild's 2002 singleton indefinite, and Farkas's **determined reference**).<sup>2</sup> With anti-specificity, the

<sup>1</sup> The underlying idea here is that at least some NPI and FCI phenomena relate to inability of linguistic expressions to refer or to receive values – an approach that can be traced back to my very first writings on polarity (Giannakidou 1997; 1998). At the same time, as I said at the beginning, the theory I have been defending since then allows for diverse NPI semantics, and in later work (Giannakidou 2007; 2011; Giannakidou & Yoon 2016), I acknowledged focus and scalar semantics as such other semantic sources of polarity. NPIs and FCIs that contain EVEN or bear inherent focus can be scalar. Giannakidou and Yoon (2016) propose that the emphatic variant of *kanenas* is indeed a scalar and exhaustive NPI. Scalar and focused NPIs do produce exhaustive inferences, and the crucial point is that referentially vague NPIs are not scalar and thus also not exhaustive.

<sup>2</sup> The referentially vague reading has also been called "low referential" (Partee 2008), "epistemic" (Alonso-Ovalle & Menéndez-Benito 2013), "modal" (Alonso-Ovalle & Menéndez-Benito 2010), "irreferential" (Jayez & Tovena 2006), "extremely non-specific" (Farkas 1997). Referentially vague indefinites need not be NPIs (Spanish *algún* is not, for example, nor is the Latin paradigm *aliquis*, Gianollo 2013); but NPIs in Greek, Mandarin and Korean are interpreted as referentially vague. Referentially vague NPIs are quite common, and been identified also in Albanian as said previously (Xherija 2014), Bengali (*ka*-indefinites, Ullah 2016) Dutch (Hoeksema 1999), Salish (Matthewson 1998); see further Giannakidou (2011). English appears to lack this type of NPI; *some or other* is the closest equivalent, but it is not very common, and it may even sound marked. The NPIs in Greek, Mandarin and Korean, are routine and unmarked.



core epistemic component merely requires some choice of two or more values in the speaker's mind.

Referential vagueness is not exhaustive: it is a mere existential requirement that there be choice of alternative values. This "weak" existential condition can be strengthened into exhaustive variation (Giannakidou 1997; 1998; 2001), producing free choice. Exhaustive variation means that we are now required to exhaust all values in the domain:

(15) Presupposition of exhaustive variation (Giannakidou 2001):

$\forall w_1, w_2 \in W : \llbracket \alpha \rrbracket^{w_1} \neq \llbracket \alpha \rrbracket^{w_2}$ , where  $\alpha$  is the free choice phrase.

The free choice reading is thus exhaustified, and exhaustive variation is responsible for the universal-like reading of FCIs, and NPIs with a free choice component. Exhaustivity, as indicated above, need not invoke an elaborate mechanism of grammar. It can simply be viewed as a lexical contribution, i.e., a presupposition or implicature of the NPI or FCI itself (Kratzer & Shimoyama 2002; Aloni 2007, and Menéndez-Benito 2010, on the other hand, stipulate covert operators). With *any*, Giannakidou (2001) argues that exhaustive variation is an implicature that gets cancelled in negative and downward monotonic contexts (as implicatures typically do in these contexts, and *any* lacks free choice there). The contrast between referential vagueness and free choice is crucial in framing the question of exhaustivity because it shows a way to do it without invoking additional covert machinery, and also because it allows finer distinctions within the anti-specificity domain that are relevant for NPI and FCI classes.

To further illustrate that the Greek, Korean, and Mandarin NPIs exhibit non-exhaustive variation and lack the exhaustified free choice, consider a context that requires exceptions:

- (16) a. Bori na mas idhe kanenas. NPI: referentially vague  
 can SUBJ us saw.3SG NPI-person  
 Ala oxi o Janis, afu den bori na dhi sto skotadi.  
 'Someone could have seen us. But not John! He can hardly see in the dark.'
- b. Bori na mas idhe opjosdhipote. *Any*, FCI: free choice  
 can SUBJ us saw.3SG FCI-person  
 #Ala oxi o Janis, afu den bori na dhi sto skotadi.  
 'Anybody could have seen us. #But not John! He can hardly see in the dark.'

The exceptive 'but not John' is odd with the Greek FCI and *any*; the Greek NPI, on the other hand, is compatible with the exceptive, as expected.

It seems fair to conclude, then, in agreement with the existing literature, that NPIs like *any* may receive exhaustive free choice interpretations

in modal contexts, but in the same contexts the Greek, Korean and Mandarin NPIs remain referentially vague and non-exhaustive. Importantly, the exhaustive free choice reading of *any* does not surface with negation or in questions:

- (17) a. \*Did she eat almost anything? (Giannakidou & Quer 2013)  
 b. \*/#She didn't eat almost anything. (Horn 2005)

The exhaustivity thesis in (1) does not allow the option of non-exhaustified NPIs, and cannot predict either the initial contrasts we observed here between Greek, Korean, Mandarin and *any*, or the non-exhaustive (non-free choice) reading of *any* in the classical licensing cases of negation and in questions.

### 3. The licensing question: nonveridicality

In the light of the data just discussed, does it make sense, given the observable semantic difference among NPIs, to treat them all – including those that are referentially vague – as ‘exhaustified’? And, given that *any* is not always free choice, does it make sense to treat even this item as necessarily exhaustified, as required by (1)? (1) says that we have to treat all NPI and FCI occurrences as exhaustified. But if we do, the differences in meaning, in the same contexts, and the lack of exhaustified readings for *any* in the common NPI uses (negation, questions) become mysterious.

Alternatively, we could simply conclude that referentially vague NPIs are not exhaustified, in agreement with the literature that has studied them, and admit that *any* is not always exhaustified either. But denying exhaustification for a subclass of NPIs or for *any* undermines the very goal of (1) which imposes a uniform core semantics across all NPI and FCI paradigms; it is therefore no surprise that (1)-based accounts have either ignored the data presented here (although the Greek data have been known for more than 20 years) or have downplayed their relevance by denying the status of Greek-style NPIs as “proper”. It becomes necessary, then, to establish the “properness” of the Greek type of NPI, and along with it, of the Mandarin and Korean NPI. This task is undertaken in 3.1, where we see that these items meet exactly the distributional criterion of *any*, i.e., appearance in nonveridical contexts. In 3.2 we defend the nonveridicality thesis in the light of some comments in Chierchia (2013).

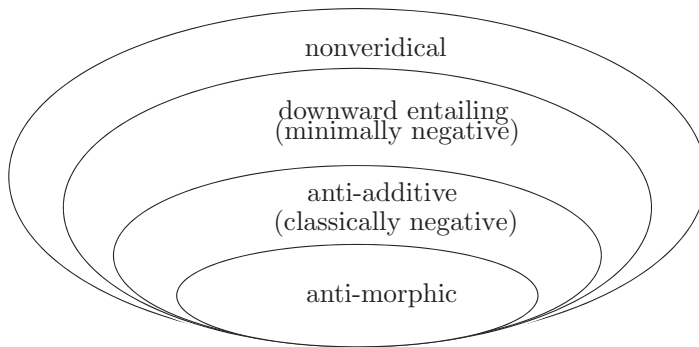
### 3.1. The distributional criterion: NPIs and FCIs are licensed in nonveridical contexts

What makes an NPI proper? If one looks at the distributional criterion of licensing, it becomes apparent (examples (2)–(4)) that the Greek, Korean, and Mandarin indefinites NPIs are just like *any*: they are excluded from the positive, unmodalized, veridical context. Given this core fact, it seems unreasonable, on an empirical basis, to even consider Greek *kanenas*, Korean *rato*, and Mandarin *shenme* as “less proper”. The first works on these data (Giannakidou 1994; 1997; Lin 1996) treated *kanenas* and *shenme* as NPIs precisely because they behave like *any* as regards this core criterion of exclusion in veridical contexts.

The only reason one might think of *any* as “more proper” than *kanenas*, *rato*, and *shenme* is pure historical accident: since Klima’s (1964) seminal work, the NPI literature focused for many years on English NPIs and *any* and it was only in the mid-nineties that the Greek and Mandarin NPI facts became known. The sustained narrow focus on English *any*, which sadly still characterizes some strands in the literature, creates bias and misleads one into believing that *any* provides a more relevant set of data. This position has no empirical validity whatsoever, and stands in the way of an accurate understanding of what kinds of polarity sensitivities exist and should be accounted for. NPI diversity exists and is massive, and theories that deny it can hardly be taken seriously.

As a general pattern, all NPIs – *kanenas*, *-rato*, *shenme*, *any* – are excluded from veridical contexts, as shown in Table 1. This is the foundational property that makes all four quite proper NPIs. And, as will be shown later in the discussion of subtrigging, the Greek, Korean and Mandarin NPIs never improve in veridical contexts, unlike *any* which does. They are, in this respect, more proper than *any*. NPIs occur further in nonveridical contexts, which include: minimally negative contexts (i.e., downward entailing (DE), Ladusaw 1979) and classically negative contexts (i.e., anti-additive and anti-morphic; see Zwarts 1995; 1996 for elaboration). But, as the early work of Giannakidou (1994; 1997; 1998) revealed, and can be recalled by the data in section 1 (8)–(13), NPIs occur also in nonveridical contexts that are not negative (to be discussed further in 3.2). In the non-negative contexts, NPIs share their distribution with FCIs, as we saw (see Giannakidou 2011; 2017 for overviews of the data).

NPIs appear in nonveridical contexts, including negative, modal, inquisitive contexts. We can thus postulate the nonveridicality thesis below



**Figure 1:** The Giannakidou/Zwarts Nonveridicality hierarchy of polarity contexts

as a condition on where NPIs and FCIs can occur. Following standard practice, the nonveridicality thesis is stated as a scope condition:

(18) **Nonveridicality thesis** for NPIs and FCIs

An expression  $F$  licenses NPIs and FCIs in its scope iff  $F$  is nonveridical.

The Nonveridicality thesis is a condition on the semantics of the licenser: it says that if an expression  $F$  is nonveridical,  $F$  will be able to license NPIs or FCIs, and vice versa. It can also be understood as a condition on the licensee: when we see an NPI or an FCI, we know that the context is the scope a nonveridical operator  $F$ . Individual distributions of NPIs and FCIs have been exemplified in previous works, and we will not review them here; a (non-exhaustive) summary of the environments is given in Table 1.

The distributions that we see are almost identical. *Any*, NPIs *kanenas/rato/shenme*, and the Greek FCI *opjosdhipote* are all found in nonveridical contexts, and are excluded from veridical contexts. FCIs are, in addition, blocked from episodic negative contexts for reasons explained in Giannakidou (2001) (and which are not relevant here). Hence, from the perspective of distribution, which is the key to polarity membership, all NPIs and the FCI above are polarity items, none being more or less proper than the other. Now, the differences between *kanenas*, *rato*, and *shenme*, on the one hand, and *any* on the other, are, as noted earlier, interpretational: *any* tends to get a free choice interpretation in non-negative contexts, that the other NPIs lack. Therefore, while nonveridicality is the unifying semantic property of all polarity licensers, and there is generally great overlap in distribution among the paradigms, it must be accepted that distinct lexical semantic properties of polarity items will play a key

**Table 1:** Distributions of *any*, NPIs *kanenas/rato/shenme*, and the Greek FCI *opjosdhipote* in various nonveridical contexts; FC means ‘with free choice reading’

Environments	<i>any</i>	<i>kanenas/rato/shenme</i>	FCI <i>opjosdhipote</i>
1. Negation	OK	OK	*
2. Questions	OK	OK	OK
3. Conditional ( <i>if</i> -clauses)	OK	OK	OK
4. Restriction of <i>every/all</i>	OK; FC	OK	OK
5. DE quantifier (e.g., <i>few</i> )	OK	OK	OK
6. Modal verbs (e.g., <i>may</i> )	OK; FC	OK	OK
7. Nonveridical verbs (e.g., <i>hope</i> )	OK; FC	OK	OK
8. Imperatives	OK; FC	OK	OK
9. Disjunctions	OK; FC	OK	OK
10. <i>Before</i> -clauses	OK	OK	OK
11. Future modals	OK	OK	OK
12. Affirmative past	*	*	*
13. Veridical verbs ( <i>believe, dream</i> )	*	*	*

role in determining exactly which subset of nonveridical contexts a specific paradigm will occur in, and how it will be interpreted. This is the diversity position I have defended since Giannakidou (1997; 1998). In order to accept this position, one must accept that there is variation in the lexical semantic properties of NPIs, a position incompatible with (1).

The following contrasts with necessity modals illustrate further the meaning variation between *any*, and *kanenas/shenme*:

- (19) a. Yuehan bixu gen wo jie shenme shu. (Mandarin)  
 John must from I borrow NPI book
- b. O Janis prepi na danistei kanena vivlio. (Greek)  
 the John must SUBJ borro.3SG NPI book  
 ‘John must borrow a (=some or other/<sup>#</sup>any) book (from me).’
- (20) a. Yuehan yao qu mai ben shenme shu kan. (Mandarin)  
 John will go buy CL NPI book read
- b. O Janis tha pai na agorasi kanena vivlio. (Greek)  
 the John will go.3SG SUBJ buy.3sg NPI book  
 ‘John will go to buy a (=some or other/<sup>#</sup>any) book (to read).’

*Kanenas* and *shenme* share distribution and meaning in modal contexts. In the specific contexts above, the free choice reading is infelicitous, and so is *any*, as we see. Hence *any* is similar to *kanenas/shenme* in appearing in modal contexts (*John may read any book*), but the free choice meaning constrains further its distribution (Giannakidou 1997; 1998; 2011) with necessity modals (more in section 5). The contrast observed suggests that *any* and the Greek/Mandarin NPI must have distinct semantics, namely the latter lacks free choice.

Before we conclude this discussion, let me remind the reader that *any* appears with disjunction again with free choice meaning. Here is an example from Zwarts (1995), a translation of Plato's *Protagoras and Meno* [23: 146], and an example with *kanenas* from my earlier work:

(21) I hope no relative of mine or *any of my friends*, Athenian or foreign, would be so mad as to go and let himself be ruined by those people. (Zwarts 1995, 295, ex. (19))

(22) I bike mesa kanenas i afisame to fos anameno.  
Or entered.3SG in NPI.person or left.1PL the light lit  
'Either some person or other (#anyone) must have come in or we left the light on.'  
(Giannakidou 1997; 2011)

NPI licensing by disjunction has been one of the very first arguments in favor of the nonveridicality thesis, and *any* is no different from *kanenas*, as we see, in being licensed by disjunction. There is a meaning difference, however: *any* has free choice meaning with disjunction, but *kanenas* does not. The free choice meaning restricts the distribution of *any* further in a context that will not allow it, hence the infelicitous (22). The meaning difference again makes us conclude that the source of NPI-hood for these two types of NPIs cannot be the same, as is required by (1). And the licensing of *any* by disjunction shows beyond reasonable doubt that nonveridicality is relevant for *any*, too.

To sum up, a successful theory of the distribution of *any* must predict its appearance in nonveridical, not just negative or DE contexts. As Figure 1 shows, negative and DE functions are merely a proper subset of nonveridical functions (see Zwarts 1995 for a proof; Giannakidou 1997; 1998), the nonveridicality thesis is therefore a (conservative) extension of the negation and DE scope conditions, allowing unification of the polarity licensers as a natural class, while also correctly predicting wider distribution of NPIs in non-negative contexts such as modals, disjunctions, and questions (Table 1).

### 3.2. Chierchia's discussion of nonveridicality

Chierchia (2013, 69–76) contains a brief discussion of the nonveridicality thesis (18) with the intent to challenge it. He attempts to do that, however, without considering the data that motivated (18), and without empirical comparison between his (1) and the predictions of (18). He nonetheless declares that “at a descriptive level, (non)veridicality appears to face a **goodly measure** [emphasis mine] of empirical hurdles”, and that “at a theoretical level, it seems difficult to ground such a notion in a well defined *independent* [sic] lexical-semantic property of the relevant morphemes, in spite of Giannakidou's valuable attempt” (*op.cit.*, 76). Chierchia targets an early version of my theory (specifically Giannakidou 1999; 2001) without taking into account its developments such as the concept of dependent variable (to be discussed in section 5), or the parts of the early theory that deal with semantic diversity of NPIs and FCIs.

The intended analytical challenge to nonveridicality is therefore purely theoretical, and, as we shall see, fails to recognize a difference – central to both (non)veridicality and to the licensing of NPIs – between Hintikka belief, which is veridical, and the non-Hintikka “belief” that arises with modal verbs, which is nonveridical. Before addressing the argument, however, let me first correct some errors in the presentation regarding the category “NPI”.

Chierchia attributes to me a distinction that does not exist in my work but which implies that the Greek NPI type is not proper. He employs the infelicitous term **affective polarity item** (API) used in Giannakidou (1999) (and which I have since then abandoned) as a replacement for “NPI”. In the 1999 paper, I proposed indeed the following three categories of “APIs” (*ibid.*, 410):

**Table 2:** A typology of Greek APIs based on nonveridicality

Type	Licensed by	Directly	Indirectly	Examples
weak	nonveridicality	yes	yes	nonemphatics
strong	antiveridicality	yes	yes	minimizers
superstrong	antiveridicality	yes	no	emphatics, <i>epi xronia, ke toso adj</i>

(“Nonemphatics” are the *kanenas* NPIs; emphatics are their emphatic variants used only with negation and in anti-veridical contexts; for more recent discussion with experimental evidence see Chatzikonstantinou 2016.)

Weak, strong, and superstrong “APIs” are used above as labels for the better known weak, strong and superstrong “NPIs”. Crucially, at no point in the 1999 paper or in any subsequent or prior work, do I make the distinction between “APIs” and “NPIs” that is reported in Chierchia (2013, 69: (87)):

Chierchia (2013, example (87))

- a. An “Affective Polarity Item” (API) [sic] is licensed in S iff A is non-veridical.
- b. A negative polarity item (NPI) is licensed in S iff S is anti-veridical.

Distinct labels – API and NPI – allow the misconception (refuted earlier) that APIs (i.e., *kanenas* NPIs) are distinct from NPIs proper. This was the main reason that I abandoned the term “API”. While, as I argued earlier, it does not make sense to treat *kanenas* as not proper, (87) reflects a category distinction that Chierchia himself is indeed willing to make in order to cast doubt on the relevance of the Greek data that initiated the extension from DE to nonveridicality.<sup>3</sup>

Chierchia presents further the distribution of non-NPIs such as the German *irgendein* as an empirical challenge to nonveridicality. But *irgendein* is not an NPI (Kratzer and Shimoyama 2002), and it is therefore unsurprising that it appears in the veridical context (Chierchia 2013, 71: (90a)):

Chierchia (2013, example (90))

- a. Irgendein student hat für dich angerufen.  
'Some student of other (I don't know who) called for you.'

The distribution of the indefinite *irgendein* bears no relation to that of NPIs, which are excluded by definition from positive veridical contexts, as we saw.<sup>4</sup> Indeed, *irgendein* is referentially vague; but this reading is not exclusive to NPIs. Non-NPI anti-specific indefinites do exist, e.g., Spanish

<sup>3</sup> In addition to API, Chierchia uses the term ‘polarity sensitive item’. Proliferation of terms for the same category is not helpful for clear argument, and often is the cause of fallacy or confusion. For this reason, since 1999 I only use the terms NPI, and PI (“polarity item”) to refer to polarity expressions.

<sup>4</sup> Chierchia (2013, 71) offers (90b) as one example of *shenme* in a veridical context. But this is a kind-denoting use (‘some kind of pillow’), and not the indefinite NPI *shenme* that we are talking about. This use is consistent with referential vagueness (some kind of pillow, I don't know what kind exactly); and it might suggest that certain grammaticalizations of *shenme* may not be NPIs. Greek and Korean NPIs do not have such uses. The corpus data of Lin (2015) includes no occurrences of indefinite NPI-*shenme* in veridical contexts.



*algún* and Latin *aliquis* (Gianollo 2013) are not NPIs, but have referentially vagueness; there is more discussion on this point in Giannakidou & Quer (2013) and Giannakidou & Yoon (2016). Importantly, (90a) is the only example given by Chierchia as a challenge to the empirical relevance of nonveridicality; but this one example is hardly sufficient to justify the conclusion that “at a descriptive level, (non)veridicality appears to face a **goodly measure** [emphasis mine] of empirical hurdles” (Chierchia 2013, 79), and that “at a descriptive level (non)veridicality *prima facie* **faces at least as many empirical hurdles as ‘being DE’**” (*ibid.*, 73, emphasis added). The estimate “at least as many”, when no actual empirical comparison is done between the predictions of (1) versus (18) is of very limited validity.

Let us now turn to the analytical argument. Chierchia claims that according to Giannakidou’s definition of nonveridicality, “a possibility modal like *can*, or any intensional verb like *want* or *believe* are examples of nonveridical operators” (Chierchia 2013, 69). This is, in fact, not true. One of the major theoretical proposals made already in my very early work (Giannakidou 1994) is that doxastic attitudes of knowledge and belief, unlike modal verbs and *want*, are veridical.<sup>5</sup> (This contrast, in fact, explained also why the former take indicative but the latter subjunctive in Greek, a point that I will not pursue in detail here but which led me to argue that the subjunctive itself is also a polarity item; see further Giannakidou 2009; Quer 2009).

Belief verbs are veridical, I argued, because they have the classical Hintikka (1962) semantics and contrast with volitionals and modals, which I have characterized consistently as nonveridical and which license NPIs. *Believe* does not license NPIs. Consider here some data with *any*:

- (23) a. \*Ariadne believes that Nicholas talked to anybody.  
 b. I hope there is any left. (example due to L. Horn, cited in Giannakidou 1994)  
 c. Ariadne may/might talk to anybody.

*Believe*, I argued, is veridical hence not a predicted NPI licenser by (18), but *want*, *hope* and modal verbs are nonveridical, hence predicted NPI licensers. The contrast has been one of the main arguments for nonveridicality, and generalizes to a divide among (a) volitional propositional attitudes and modals which license NPIs, and (b) doxastic verbs (including dream, fiction, memory, perception) and epistemic attitudes which do not. Here are some of the early cited Greek examples:

<sup>5</sup> Three pages later (Chierchia 2013, 72), we find my correct position about the Hintikka semantics of believe in the discussion of (91). Within three pages, then, Chierchia attributes to Giannakidou a contradictory belief about *believe*.

- (24) a. \*O Pavlos pistevi oti idha {kanenan/opjondhipote}.  
 the Paul believe.3SG that.IND saw.1SG NPI/FCI  
 ‘\*Paul believes that he saw anybody.’
- b. \*O Pavlos kseri oti agorasa {kanena/opjodhipote} aftokinito.  
 the Paul know.3SG that.IND bought.1SG NPI/FCI car  
 ‘Paul knows that I bought any car.’
- c. \*O Pavlos onireftike oti agorasa {kanena/opjodhipote} aftokinito.  
 the Paul dreamt.3SG that.IND bought.1SG NPI/FCI car  
 ‘Paul dreamt that I bought any car.’
- (25) I Ariadne tha ithele na milisi me {opjondhipote/kanenan} fititi.  
 the Ariadne would like.3SG that.SUBJ talk.1SG with FC/NPI student  
 ‘Ariadne would like to talk to any student.’
- (26) I Ariadne bori na milise me {opjondhipote/kanenan} fititi.  
 the Ariadne can that.SUBJ talked.1sg with FC/NPI student  
 ‘Ariadne might have talked to any student.’
- (27) a. John would like to invite any student.  
 b. John asked us to invite any student.

This correlation is found in many languages, and is not predicted if we assume DE or negation to be the licensing property of NPIs. Note also the correlation with indicative (\*) vs. subjunctive mood.

To account for this contrast in NPI licensing and veridicality, I proposed to relativize (non)veridicality to individuals and their modal bases. In assessing truth, speakers form judgments about the veridicality of a sentence. The veridicality judgment thus involves truth relative to what a speaker knows or believes (Giannakidou 1994; 1998; 1999; 2009; 2013; Harris & Potts 2009; de Marneffe et al. 2012; Giannakidou & Mari 2016; 2018; to appear). That such relativization is needed becomes particularly visible with propositional attitude verbs, but the role of the individual in assessing truth is apparent even in unembedded sentences, as expressed lucidly in Harris and Potts’s (2009) assertion that all sentences are perspectival. In my own work, I made veridicality a precondition on assertion: *p* is assertable only if the speaker knows or at least believes *p* to be true. I captured the role of the individual in making veridicality judgments with “individual anchors” and “models” *M* of evaluation. Following standard practice, these models are sets of worlds, representing what the individual anchor believes or knows. I thought of models as “modal bases”

associated with individuals, or epistemic states (see especially Giannakidou 1999; 2013):

(28) Model of an individual (Giannakidou 1999, (45))

Let  $c = \langle cg(c), W(c), M, s, h, w_0, f, \dots \rangle$  be a Stalnakerian context.

A model  $M(i) \in M$  is a set of worlds associated with an individual  $i$  representing worlds compatible with what  $i$  believes or knows.

(29) a. John won the race.

b.  $\llbracket \text{John won the race} \rrbracket = 1$  iff

$\forall w[w \in M(s) \rightarrow w \in \lambda w'. \text{John wins the race in } w']; s$  is the speaker.

This tells us that if the speaker decides in a context to truthfully (by Gricean *Quality*) assert the sentence *John won the race*, (s)he must know or at least believe that John won the race. Hence all worlds in the model  $M(s)$  are *John-won-the race* worlds, hence:  $M(s) \subseteq p$ . We can thus generalize:

(30) Veridicality as truth in an a model

A proposition  $p$  is true in an epistemic model  $M(i)$  iff:

$\forall w[w \in M(i) \rightarrow w \in \lambda w'. p(w')]$

When all worlds in  $M(i)$  are  $p$  words,  $i$  is said to be in a veridical state of being fully **committed** to  $p$ . When this is the case, no NPIs will be licensed. Chierchia too claims that sentences often express belief of the speaker (2013, 73). I could not agree more, and have actually strengthened his *often* to *always*.

We can now define veridicality with respect to  $M$ :

(31) (Non)veridicality for propositional operators (Giannakidou 1998; 1999)

i. A propositional operator  $F$  is **veridical** iff  $Fp$  entails or presupposes that  $p$  is true in some individual's model  $M(i)$ ;  $p$  is true in  $M(i)$ , if  $M(i) \subset p$ .

ii. If it is not the case that all worlds in  $M(i)$  are  $p$ ,  $F$  is **nonveridical**.

The difference between a veridical function and a nonveridical function  $F$  is that in the former case  $M$  is homogenous, but in the latter case  $M$  contains also non- $p$  worlds. A veridical  $M$  expresses knowledge or Hintikka belief; a nonveridical  $M$ , on the other hand, expresses what Giannakidou and Mari (to appear) call **suppositional belief**, which is a weaker doxastic attitude that contains a 'not know' component.<sup>6</sup> Attitude verbs such as the words *believe*, *know*, *dream*, and their Greek counterparts, are veridical because

<sup>6</sup> Suppositional belief licenses the subjunctive mood, as can be seen clearly in Italian. Mari (2016) refers to suppositional belief as conjectural belief.

they express Hintikka beliefs. Modal verbs and adverbs, on the other hand, express suppositional belief and indicate lack of knowledge or Hintikka-belief of  $p$  (see Giannakidou & Mari 2016; 2018; to appear for more detailed discussion). Giannakidou and Mari state explicitly nonveridicality as a presupposition on modal bases of all modals, and Condoravdi (2002) posits a similar constraint (labeled ‘diversity’ condition on modal bases). Modal bases of modal verbs are nonveridical spaces, and contain both worlds where  $p$  is true and worlds where it is not.

Hence I am happy to concur with Chierchia that beliefs of the speaker (or the sentence subject) are relevant for veridicality. However, Hintikka belief is veridical but the weaker belief of the modality is non-veridical, and (18) correctly predicts that NPIs (and FCIs, let it be recalled) will be licensed by the latter but not by the former. Nonveridicality thus predicts the correct patterns with attitudes and modals, and explains easily also why questions (called **nonveridical prototypes** in Giannakidou 2013) are common licensors of NPIs.<sup>7</sup> I cannot see how Chierchia’s theory, or any theory based on negation or DE alone can handle the empirical contrasts with doxastic attitudes and modals presented by NPIs.

Chierchia states incorrectly that “any operator that is non-veridical in the naïve [sic] sense that fails to license PSIs [sic: NPIs in our current terminology] can be re-analyzed as veridical along the same lines. And vice versa, elements that are good licensors of APIs could readily be analyzed as veridical” (Chierchia 2013, 72). The system is not as free as it is portrayed in these passages. And, when Chierchia suggests as problematic the fact that “the sentence *There might be anyone I know in that house* expresses, at some level, a belief of the speaker” (*ibid.*, 73), it is because he fails to consider the difference between Hintikka belief (veridical) and the modality (nonveridical) which is central to the non-veridicality thesis.

We must conclude, therefore, that the nonveridicality thesis remains unchallenged by Chierchia’s discussion. Nonveridicality is indeed the unifying property of NPI licensors, as well as, as it turns out, subjunctive mood.

We can move on now to address Chierchia’s specific implementation of exhaustivity. The goal should be to derive (a) the distribution of NPIs in nonveridical contexts, and (b) the meaning differences between NPIs with a free choice component and NPIs without it.

<sup>7</sup> Giannakidou (1997; 2013) argues that unbiased questions are like epistemic modals, i.e., modal spaces in nonveridical equilibrium, where  $p$  and not  $p$  are equally “believed”, thus conveying the weakest possible belief. Questions have consistently been problematic for negation and DE approaches (as admitted also in Guerzoni & Sharvit 2007). Disjunctions and imperatives also denote nonveridical  $M$ s, and are licensing environments for NPIs (recall Table 1).

#### 4. Exhaustification and NPI licensing Chierchia style

The program of (1) is initiated in Chierchia's (2006) *Linguistic Inquiry* article, and expanded in his 2013 book. Chierchia and Liao (2015) develop further the syntactic part of the theory, which addresses the Mandarin NPI *shenme*. These three works will be jointly referred to below as the "Chierchia program".

##### 4.1. Chierchia 2006; 2013: covert $O$ and checking of $\sigma$

The program is inspired by Kadmon and Landman's (1993) domain widening and Krifka's (1995) application of focus semantics to *any* (themselves inspired by earlier works by Fauconnier 1975 and Horn 1972 on pragmatic scales). Unlike Chierchia, neither Kadmon and Landman nor Krifka propose general theories for NPIs; rather, they propose theories specific for *any*. Krifka actually acknowledges two versions of *any* – he calls them emphatic and non-emphatic *any* – only one of which is "exhaustive" (the emphatic one). There are more voices in recent literature noting non-emphatic and non-scalar *any* (Duffley & Larrivée 2010; Giannakidou 2011).

Chierchia posits (scalar or subdomain) alternatives for *any*, and assumes two additional devices: (a) a phonologically null counterpart of *only* ( $O$ ) and (b) a syntactic  $[\Sigma]$  feature on the NPI. As Geurts (2009) and Giannakidou and Quer (2013) point out, no independent evidence of the existence of these devices is provided; and  $O$  and  $[\Sigma]$  do not follow from focus alternatives. Focus theories (Krifka 1995; Rooth 1985; 1992; Beaver & Clark 2008) propose alternatives without exhaustifying them syntactically, unless there is conventional association with focus with overt *only* (or some equivalent). Neo-Gricean theories have also proposed models of scalar alternatives without  $O$  (Geurts 2010). Thus, addition of  $O$  with alternatives is a special move for *any*, and the acceptance  $O$  must rest entirely on how successful  $O$  is at capturing its distribution.

Chierchia (2006, (19)) defines covert *only*  $O$  as follows:

Chierchia's  $O$

- a.  $O_C[q] = q \wedge \forall p [[p \in C \wedge p] \rightarrow q \subseteq p]$   
( $O$  is a mnemonic for *only*:  $q$  and its entailment are the only members of  $C$  that hold)
- b.  $[[\phi]]_s = O_C[[\phi]]$ , where  $C = [[\phi]]^{\text{ALT}}$

Covert  $O$  is posited to be a syntactic object like the focus particle *only*: as expected by overt *only*, when  $O$  applies to a proposition  $p$ , we have

a reading of  $p$  such that only  $p$  and its entailments are true, and all alternatives not entailed by  $p$  are false. This works well with negation, but delivers a contradiction in the positive sentence. Consider first negation:

- (32) a.  $O$  [There aren't any cookies]  
 b.  $ALT-D = \{D' | D' \subseteq D\}$ ;  $D =$ cookies in the kitchen  
 c.  $ALT-p = \{\text{there aren't cookies in the cupboard, there aren't cookies on the shelf, there aren't cookies on the table}\}$ .

Application of  $O$  is felicitous because all propositions based on the smaller subdomains are entailed. Scale reversal is always good because the assertion entails the negation of all the (smaller) alternatives.

Without negation, application of  $O$  creates a contradiction:

- (33) a.  $*O$  [There are cookies in the kitchen]  
 b.  $ALT-p = \{\text{there are cookies in the cupboard, there are cookies on the shelf, there are cookies on the table}\}$

The propositions in  $ALT-p$  are now not entailed, and must therefore be false, by  $O$ . This leads to a contradiction: the sentence says that there are cookies in the kitchen but not in any of the subdomains of the kitchen. Chierchia says that application of  $O$  is “pointless” (to use his own term), and pointlessness leads to contradiction. This type of explanation originates, to my knowledge, in Kadmon & Landman (1993), and works well with describing why negation is good for NPIs, and why NPIs cannot occur without it.

NPIs, however, are not merely infelicitous; they are **ungrammatical** if unlicensed. And as pointed out in Giannakidou (2011) and Giannakidou & Quer (2013), it would be surprising if contradiction alone were to suffice to rule out the ungrammatical NPIs. Chierchia himself also acknowledges this insufficiency:

- (34) “So why is a sentence like [47a] (an NPI-licensing violation) ungrammatical? There is an impasse here between the way domain widening explains the distribution of NPIs (using Gricean principles) and the way such principles are typically taken to work...”  
 (Chierchia 2006, 557)

Chierchia then posits a lexical entry for *any* ((51) in his 2006 article) where *any* has an uninterpretable syntactic feature  $[+\sigma]$  (Chierchia 2006, 559). The  $[+\sigma]$  requires that *any* be in the checking domain of a negative or DE operator which can check the feature. The  $[+\sigma]$  is a syntactic feature, and the grammaticality of *any* depends on the checking of this feature, as reflected in the lexical entry Chierchia supplies (clause a.iii below):

- (35) a. Lexical entry for *any*
- i.  $\llbracket \text{any}_D \rrbracket = \lambda P \lambda Q \lambda w [\exists w' \exists x \in D_{w'} (P_{w'}(x)) \wedge Q_w(x)]$
  - ii.  $\text{ALT}(\llbracket \text{any}_D \rrbracket) = \{\lambda P \lambda Q \lambda w [\exists w' \exists x \in D'_{w'} (P_{w'}(x)) \wedge Q_w(x)]: D' \subseteq D \wedge D' \text{ is large}\}$
  - iii. *Any* has an uninterpretable feature  $[+\sigma]$
- b.  $\llbracket \phi \rrbracket_S = E_C(\llbracket \phi \rrbracket)$ , where  $C = \llbracket \phi \rrbracket^{\text{ALT}}$

The analysis of *any*, therefore, in the Chierchia program, involves covert  $O$ , and the syntactic feature  $[+\sigma]$ . These are its two “souls”.  $O$  is the pragmatic soul that exhaustifies; but the reasoning delivered by  $O$  does not suffice to account for the basic licensing failure without negation.<sup>8</sup> Checking of  $[+\sigma]$ , as *deus ex machina*, delivers licensing.

Now, recall that checking of  $[+\sigma]$  must derive, as shown in section 3, the distribution of *any* not only with negation but in nonveridical contexts, too. This means that *all* licensers in Table 1 – including modals, questions, disjunction, and nonveridical propositional attitudes – must contain syntactic heads able to check the  $[+\sigma]$  feature. It would thus have to be stipulated that these non-negative licensers are  $\sigma$  checkers. But if we say that, we disconnect the relation of  $[+\sigma]$  and the reasoning of  $O$ , because  $O$  does not work in non-assertive, non-monotonic cases such as questions, modalized assertions and intensional contexts. We are therefore left with no semantic characterization at all of what it means for a syntactic head to have  $[+\sigma]$ ; but without it, the  $[+\sigma]$  feature is merely a re-incarnation of Klima’s  $[+\text{affective}]$  feature. The syntactic soul of the program thus leaves as much to be wanted as Klima’s syntactic account did.

The Chierchia program, in other words, contrary to what a generous reader might take it to proclaim, does not supply a semantic theory of licensing but only a syntactic one. The semantic-pragmatic part (alternatives,  $O$ ) does no work in licensing, no more than the meaning of the pronominal part of a reflexive does in the Binding Theory in configurational theories like Chomsky 1986. By relying on  $[+\sigma]$ , and without an accurate semantic analysis of what it means for the licensers to be able to check it, Chierchia’s theory becomes just a variant of Klima’s, and for this reason it represents a regression in our understanding of NPI distri-

<sup>8</sup> Chierchia (2013, 49–53) appeals to unpublished work by Gajewski (2002) to justify when a contradiction is “grammatical” and when it is “ungrammatical”. Giannakidou and Quer (2013, 136–137) criticize Gajewski, and conclude that it is meaningless to even be asking whether a contradiction is ungrammatical. See Giannakidou & Etxebarria (2018) (and references therein) for more discussion on the nature of semantic judgment relevant to NPIs.

bution. If *O* does not suffice to restrict the presence of *any* to nonveridical environments, then it simply fails to derive the licensing of *any*.

Let us now ask this question: as a syntactic theory, does [+ $\sigma$ ] give us an adequate and complete analysis of *any*? I'm afraid not. First, as I just said, if we want  $\sigma$  to reflect the logic of improvement with negation (that characterizes the Kadmon and Landman, Krifka, and Chierchia systems), the non-negative licensers pose a problem, and the Chierchia theorist would have to stipulate  $\sigma$  for all nonveridical licensers. Alternatively, the Chierchia theorist would have to stipulate that there are two *anys*: an NPI one, and a FCI one. This is indeed taken up in Chierchia (2013). NPI-*any*, the argument would go, requires checking of  $\sigma$ , but the FCI-*any* does not. This, however, would entail one more stipulation – that there are two *anys* –, and would still fail to account for NPI-*any* in non-assertions such as questions (where we only have NPI-*any*, recall: \**Did you see almost anything?*). The negative vs. non-negative distinction does not map onto NPI- vs. FCI-*any* in the way the Chierchia theorist would want it to.

Second, it remains unclear how [+ $\sigma$ ] would handle the well-known contexts where *any* appears *without* a licenser. These environments were made prominent in the polarity literature since Linebarger (1980) who pointed them out as problems for both Ladusaw and Klima. I illustrate the problem with emotive predicates such as *be grateful* and *be glad*:

(36) The thing I am most grateful for is that anyone is asking any questions.  
(J. J. Abrams, *Entertainment Weekly* 54, Nov. 20, 2015)

(37) I am glad that she has any friends. (Linebarger 1980)

The urgent question here is the following: what is the negative or DE operator that checks the [+ $\sigma$ ] feature on *any* in the above sentences? Emotive verbs and predicates, especially the positive ones above, are not negative (or nonveridical for that matter), hence they cannot check the feature of *any*. Emotives were a problem for Klima's affective feature, for exactly the same reason. Equally problematic for Klima was the occurrence of *any* with *hardly* and *barely*, *long after* – all not being logically negative (Horn 2005), thus lacking + $\sigma$ :

- (38) a. John *barely* said anything.  
b. John *hardly* talked to anybody.  
c. John continued trying *long after* he had any chance of succeeding.

Giannakidou (1998; 2006) takes these cases to indicate that *any* is not always licensed. Instead, I suggested, *any* can be sanctioned without a



licenser, in which case it is **rescued** by implicit negation which the conventional meaning of *barely*, *hardly*, *be glad*, *be grateful*, *long after* triggers (i.e., as a presupposition or implicature). Rescuing is a secondary mode of sanctioning, in the absence of a proper licenser in the syntax. The Chierchia system makes no such distinction, it is therefore unable to explain why *any* appears with emotives etc. In order to maintain the *O* plus  $\sigma$  story, it would have to be stipulated that *barely*, *hardly*, *be glad*, *be grateful*, *long after* are  $\sigma$  checkers despite the fact that they are not negative or nonveridical. But if we posit that, then there is no hope to ever achieve a semantics for  $\sigma$ ; in other words,  $\sigma$  can be stipulated just anywhere.

To make things worse, there is an empirical contrast between *any* and the Greek and Korean NPI (Giannakidou 2006; Giannakidou & Yoon 2016), and as shown here, *shenme*:

(39)\*I Ariadne xairetai pu ipe tipota.  
the Ariadne is-glad.past.3SG that said.3SG anything  
'Ariadne is glad that she said anything.'

(40) Yuehan hen gaoxing zhidao Mali shuo le shenme.  
John very happy know Mary say PERF shenme  
'John is glad to know what Mary has said.'  
\*'John is glad to know that Mary has said something/anything.'

As we see, the NPIs are not admitted without a licenser; only the wh-reading of *shenme* is possible in (40). In this respect, *tipota* and *shenme* are, in fact, more 'proper' NPIs than *any*, since they cannot survive without a nonveridical licenser. *O* plus  $\sigma$  cannot account for this cross-linguistic contrast. If we were to claim, as just suggested, that the emotive verb bears the requisite  $[+\sigma]$  feature, then we must say that the Greek and Mandarin verbs do not. But if we said that, we would be merely restating the empirical contrast without explaining it.

Finally, *any* appears with *only*. Given that *O* is the covert counterpart of *only*, we would expect bare focus, which triggers *O*, to also allow *any*. But this is not what we find:

(41) a. Only Ariadne said anything.  
b. \**O* (ARIADNE said anything).

Why would covert *O* not license *any*? After all, the semantics of *O* is claimed to be identical to that of overt *only*. Therefore, if overt *only* supplies  $\sigma$  and checks *any*, why would covert *O* be any different? I am thankful to Jason Merchant for his comments on this point, which presents, in

my opinion, a very serious challenge to the theory. The problem becomes more acute when we consider the inability of *O* to license *any* in answers to questions:

- (42) Q: Who said anything?  
 A: \**O* (Ariadne said anything).  
 A': Only Ariadne said anything.

Since answers to questions trigger exhaustivity (by implicature, at least), *O* is predicted to license *any* in an answer to a question, contrary to fact. Positing *O*, therefore, overgeneralizes, and it seems difficult to respond to this systematic discrepancy without adding yet another stipulation – perhaps that despite the identical semantics, *O* and overt *only* differ in some other way that makes predicting the behavior of *O* from *only* impossible. This, however, is an unsatisfactory statement because the theory does not give us an independent criterion of how two semantically identical objects (*O*, *only*) differ other than with respect to the very facts the theory needs to explain.

In the light of this discussion, we must conclude that the Chierchia program has fundamental difficulties in handling the distribution of *any*. The program motivated by the thesis in (1) relies on two stipulations – covert *O*,  $\sigma$  – which empirically afford very little and leave much to be wanted for, specifically the actual distribution of *any* which includes negative as well as non-negative nonveridical contexts, and contexts without a licenser. The program can indeed be salvaged if augmented with the semantic treatment of  $\sigma$  as nonveridical, and Giannakidou's two modes of licensing (licensing proper vs. rescuing). But if we adopt these positions, we are left wondering why covert *O* and  $\sigma$  are needed at all – since *O*, by Chierchia's own admission, appears to do literally nothing for licensing, and  $\sigma$  now means 'nonveridical'.

#### 4.2. A Chierchia style account for the Mandarin NPI *shenme*: Chierchia & Liao (2015)

Chierchia and Liao 2015 (CL) develop further the syntactic part of the theory, and posit an interplay between two features: the  $\Sigma$  (changed from Chierchia's earlier [ $\sigma$ ]) and a *wh*-feature ([WH]). NPI-hood now means having the [+ $\Sigma$ ] feature, and *shenme* is argued to have it as well. To explain *shenme*'s use, unlike *any*, as a question word, CL claim that *shenme* has an unconstrained *wh*-feature ([u-WH]). An overview of the system is

given below; *shenme* and English items are put in the cell according to the features assumed by the CL system.

**Table 3:** Types of NPI-indefinites in Chierchia and Liao<sup>9</sup>

	[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			

The unconstrained *wh*-feature explains why *shenme* appears as a question word, and as an NPI. *Any*, on the other hand, is [-WH] and does not function as a question word. [+ $\Sigma$ ], on the other hand, predicts *any*-like NPI behavior since there is no other factor in the system that could be used to predict variation. The only difference between *any* and *shenme* in this system is that *shenme* carries [u-WH] whereas *any* has [-WH]; polarity-wise, both have [+ $\Sigma$ ].

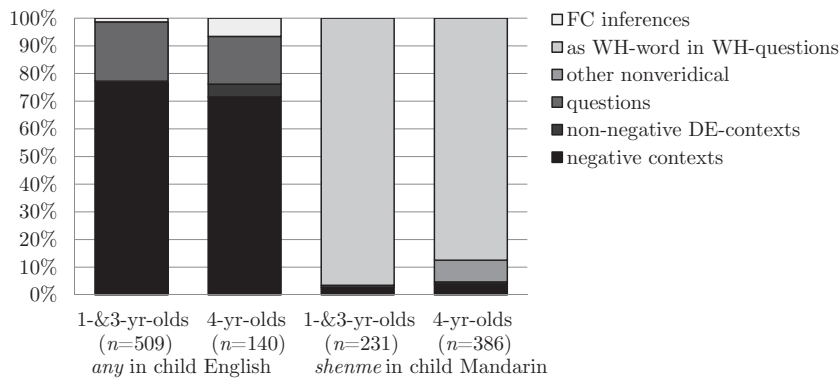
Before we proceed, some questions must be raised about the foundations of this two-feature system. CL appear to identify the *wh*-feature with being a question word, but this cannot be sufficient. What is exactly the *wh*-feature? Is it a syntactic feature? A syntactic feature, perhaps, morphologically realized? (The same question of morphological realization, by the way, arises with the  $\Sigma$  feature.). Assuming that the *wh*-feature is realized by some *wh*-morpheme, why is the Greek FCI *opjosdhipote* which contains a *wh*-feature/morpheme (*pjos*), not used as a question word (Giannakidou 2001; Giannakidou & Cheng 2006)? If *wh*-feature means ‘used as a question word’, morphological *wh*- is collapsed with interrogative *wh*; but this leads to overgeneralization. If *wh*-words all bear the *wh*-feature, similar behaviors are predicted, but Cheng and Huang (1996), and Lin (1996; 1998) show the contrary, at least for Mandarin. Giannakidou and Cheng (2006), Cheng and Giannakidou (2013) further show that *wh*-FCI *na-ge* ‘which-CL’ differs substantially in distribution from *shenme* and is an FCI, not an NPI, suggesting that the *wh*-feature alone is not a reliable predictor of distribution or NPI–FCI status. It seems more reasonable to

<sup>9</sup> The above is adapted from Chierchia & Liao (2015, (59)). Logically speaking, we also expect a type of indefinite that has a negative  $\Sigma$ -feature, an option not included in CL. To provide a complete picture of how their system looks like, we add a column headed by [- $\Sigma$ ]-only.

view *wh*-forms as being grammaticalized as NPIs along different paths, not directly derivable from the *wh*-feature.

Equally problematic is the fact that the two features – [WH] and [Σ] – bear no relation to one another. It seems to be a mere coincidence that *any* lacks the *wh*-feature, and that *shenme* has it. The significant fact that indeterminate *wh*-words are used as NPIs is entirely missed if we assume that [WH] and [Σ] bear no relation to each other. Crucially, there are reasons to believe that the relation between *wh*- and NPI use is not accidental. Lin (2015) builds an argument from the acquisition of *shenme* that the two uses follow if we assume that *shenme* denotes a dependent variable in the sense of Giannakidou (1998; 2011). I summarize the argument here.

Lin hypothesizes that if *any* and *shenme* represent the same kind of NPI, 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 Figures 2, in which the distribution of *any* and *shenme* in child language development is presented (adapted from Lin 2015, Chapter VI, Figure 11 and 12). Darker colors stand for stronger negative environments.



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

The graph demonstrates that 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. For *any*, it is found that children start out using it either in the scope of a sentential negation or in polar questions while also using it in non-negative nonveridical contexts besides polar questions (e.g., in conditionals) approximately after the age of four. 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, and shift to a broader analysis of *shenme* such that they also use *shenme* in a variety of nonveridical contexts that are not *wh*-questions later on.

According to Lin et al. (2014) and Lin (2015), the learning pathway of *shenme* can be explained if *shenme* is an NPI that contains a dependent variable, like *kanenas*. Cheng and Giannakidou (2013) and Giannakidou and Cheng (2006) already claimed that Mandarin FCIs have dependent variables (of type *i*). Lin and Lin et al. generalize this position to argue – based on acquisition data – that the Mandarin NPI *shenme* also contains a dependent variable (of type *e*). Lin argues for an acquisitional process in which children start with a narrow assumption that *shenme* is a question word but reanalyze it as a broad NPI later due to the presence of a dependent variable. When children make the initial analysis of *shenme* as a question word, they have already acquired that it contains a dependent variable: a question variable *is* dependent, i.e., it can only be licensed if bound by the question operator. After this initial binary classification (a variable is either dependent or non-dependent, Giannakidou 1998; 2011), children proceed to extend the distribution of the dependent variable to other contexts where it can be bound, namely all kinds of non-veridical contexts. Negation does not feature prominently with *shenme*, as can be seen in the graph.

What does it mean for a variable to be dependent? This question is discussed in detail in Giannakidou (1997; 1998; 2011) and Giannakidou & Quer (2013), and I offer only a brief outline here. The dependent variable is a semantic object that establishes a syntactic dependency (“licensing”). The idea is that there are two kinds of variables in natural language, dependent and non-dependent. Dependent variables are lexically “deficient”, and can only be well-formed if found in an appropriate structural relation with another expression that will value them. The presence of a dependent variable therefore creates limited distribution, and a significant portion of polarity phenomena are due to such variables.

The dependent variable class includes NPI and FCI variables – but also non-polarity variables such as reflexive pronouns, traces, distributivity markers (reduplicated indefinites in Hungarian, Farkas 1997; see also Henderson 2014), the temporal variable of the subjunctive mood (“temporal” polarity in Giannakidou 2009), and as recently argued in Grano (2011), subjects of exhaustive control verbs such as *try*, *manage*, etc. The dependent variable creates a semantico-syntactic dependency at the logical form,

and therefore 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.

The dependent variable imposes an isomorphism between semantics (dependent variable that cannot remain free) and morphosyntax (a dependent variable being a distinct syntactic object from a non-dependent variable). Dependent variables, as just noted, can be of various kinds, and the one relevant for NPIs is the non-deictic variable:

(43) Dependent non-deictic variable (Giannakidou 1998; 2011)

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

The non-deictic variable is a variable that cannot remain free, and is in need to be bound. It is designated here as  $x_d$ ; another avenue, as suggested in Giannakidou & Quer (2013), would be to represent the dependent vs. non-dependent contrast as belonging to different systems, e.g., as a difference between colored variables (Gardent & Kolhase 1996). The exact implementation is immaterial here. Question word variables, crucially, are non-deictic: they occur only as bound by the  $Q$  operators and are never free. Thus, once we acknowledge dependent variables as a class, the transition from question word to NPI becomes expected. Within the dependent variable framework such transitions are predicted to be common, as indeed appears to be the case with *wh*-indeterminates.

The dependent variable analysis therefore accounts for the NPI-status of *shenme*, and its transition from a question word to an NPI. The CL system, on the other hand, cannot explain the connection because the two features WH and [+ $\Sigma$ ] do not correlate: i.e., *shenme*'s [u-WH] does not entail that it must also be an NPI (which means bearing [+ $\Sigma$ ]) or vice versa. The extension of *shenme* from a *wh*-word to a broad NPI in acquisition is thus merely a coincidence in the CL program rather than a predicted outcome, as is the case with the dependent variable approach.

## 5. No exhaustivity for *kanenas/rato/shenme*

We proceed now to offer more empirical arguments against the exhaustivity for all thesis in (1) by studying contrasts between the Greek/Korean/Mandarin NPIs and *any*. I will use six diagnostics pointing out to the conclusion that Greek *kanenas*, Korean *rato*, and Mandarin *shenme* do not represent the same type of NPI as *any*. Our point here will be that it is impossible to derive the meaning and distribution differences between *kanenas/shenme/*

*rato*, on the one hand, and *any*, on the other, from the *O* plus [+Σ] analysis alone. Something more needs to be said about the different meanings of the two types of NPIs, specifically that *kanenas/shenme/rato* lack the exhaustified free choice component resulting in distributional differences (as we saw earlier). Some of the data to be presented were already noted in Giannakidou & Quer (2013) and Giannakidou & Yoon (2016). A preliminary version of the Mandarin data is found in Giannakidou & Lin (2016). Here I offer a more comprehensive consideration.

### 5.1. No indiscriminative readings in conditionals

As well known, *if*-clauses are proper licensing environments for NPIs and FCIs. *Any* and FCIs may (though they do not have to) trigger the so-called indiscriminative reading of “just any” in conditionals (see Haspelmath 1997; Duffley & Larrivée 2010), and here is variant of an example due to Larry Horn (2005):

(44) If you sleep with just anybody you are not being very selective.

The Greek, Korean, and Mandarin NPIs do not have indiscriminative reading, but FCIs do.

(45) An koimasai me {*opjondipote*/\**kanenan*}, dhen ise poly epilektikos. (Greek)  
 if sleep.2SG with FCI/\*NPI, not be.2SG very selective  
 ‘If you sleep with (just) anybody you are not being very selective.’

(46) Ney-ka banyak {*amwu-hako-na*/<sup>#</sup>*amwu-hako-rato*} (Korean)  
 you-NOM hypothetically sleep-can-COND  
 cal-swuis- tamyen, ne-nun acwu kkatalop-cinan-ta.  
 FCI/RVI-with you-TOP very selective-NEG-DECL  
 ‘If you can sleep with just any person, then you are not very selective.’

(47) Ruguo ni neng he \**shenme* ren shui, na (Mandarin)  
 if you can with NPI person sleep than  
 ni hai yet zhenshi bu tai tiaoti.  
 you really be not very selective  
 ‘If you can sleep with just any person, then you are not very selective.’

If, as most current accounts agree, the indiscriminative reading depends on free choice inference (which is exhaustive, as mentioned earlier), then





that only free choice brings exhaustive variation, and *kanena/shenme* lack free choice.

### 5.3. Referentially vague readings in modal contexts

Greek, Mandarin and Korean NPIs appear in modal contexts with the referential vagueness reading. *Any*, as can be seen, is impossible in this reading:

- (53) I Ariadne {*isos/bori*} na agorase xthes (Greek)  
 the Ariadne maybe/might SUBJ bought.3SG yesterday  
 {kanena/#opjodhipote} vivlio.  
 NPI/#FCI book  
 ‘Ariadne may have bought {*some/#any*} book or other yesterday.’
- (54) I Ariadne {*malon/prepei*} na agorase xthes  
 the Ariadne probably/must SUBJ bought.3SG yesterday  
 {kanena/#opjodhipote} vivlio.  
 NPI/#FCI book.  
 ‘Ariadne probably bought {*some/#any*} book or other yesterday.’
- (55) Ariadne-nun ecey eccemyen {*amwu-chayki-rato/#amwu-chayki-na*} (Korean)  
 Ariadne-TOP yesterday maybe NPI/#FCI.book  
 sa-ulswuiss-ta.  
 buy-might-DECL  
 ‘Ariadne maybe have bought {*some/#any book*} yesterday.’
- (56) Ariadne-nun ecey ama {*amwu-chayki-rato/#amwu-chayki-na*}  
 Ariadne-TOP yesterday probably NPI/#FCI.book  
 sa-ssulkesi-ta.  
 buy-may-DEC  
 ‘Ariadne maybe bought {*some/#any book*} yesterday.’
- (57) Yuehan zuotian haoxiang mai-le shenme/\*renhe shu.  
 John yesterday probably buy-PREF NPI/\*FCI book  
 ‘John probably bought {*some/#any book*} yesterday.’

The pattern is therefore quite consistent: the Greek, Mandarin and Korean NPIs do not receive free choice in modal contexts. The Chierchia system does not offer us a way to handle this contrast. But if we assume that the

NPIs have referential vagueness, they invoke alternatives which are not exhausted, and there is no conflict in the examples above.

#### 5.4. No subtriggering

In veridical simple past sentences, all NPIs are ungrammatical. However, *any* improves with a relative clause – a phenomenon known as subtriggering (LeGrand 1975). In this case, *any* is interpreted again universal-like (see discussions in Dayal 1998; Giannakidou 2001; Horn 2005). *Kanenas*, *rato*-NPI and *shenme*, in contrast, cannot be subtriggered:

- (58) a. \*John bought any book.  
 b. John bought any book that he could find.
- (59) \*O Janis aghorase kanena vivlio (pou vrike stin aghora). (Greek)  
 the John bought.3SG NPI book REL found.3SG in-the-market  
 Intended: ‘John bought any book that he found on the market.’
- (60) \*Con-un ku-ka palkyenha-n etten-chayki-rato sa-ss-ta. (Korean)  
 John-TOP he-NOM found-REL NPI.book buy-PST-DECL  
 Intended: ‘John bought any book that he found.’
- (61) \*Yuehan mai-le (ta neng zhao-dao de) shenme shu. (Mandarin)  
 John buy-PERF he can find-PERF REL NPI book  
 Intended: ‘John bought any book he could find.’

Thus, *kanena*, *rato*, and *shenme* contrast again with *any*, and need a proper licenser. In this respect, *kanena*, *rato*, and *shenme* are more “proper” NPIs than *any* since they can simply not become licit in the veridical context. They always need a licenser.

FCIs, on the other hand, can undergo subtriggering in the veridical context as expected:

- (62) Yuehan mai-le \*(ta neng zhao-dao de) renhe shu. (Mandarin)  
 John buy-PERF he can find-PERF REL FCI book  
 ‘John bought any book he could find.’
- (63) O Janis aghorase opjodhipote vivlio \*(vrike stin aghora). (Greek)  
 he John bought.3SG FCI book found.3SG in-the market  
 ‘John bought any book that he found on the market.’

Subtriggering thus allows *any* to be rescued (i.e., to be sanctioned without a licenser, recall Giannakidou 2006); but Greek, Korean, and Mandarin NPIs cannot be rescued, again in agreement with what we saw earlier. Giannakidou and Cheng 2016 specifically argue that the subtriggered FCI (free choice free relative, in their terminology) is not licensed. The subtriggering diagnostic, therefore, reveals two more differences between the Greek, Korean, Mandarin NPI class and *any* that do not follow from (any implementations of) (1).

### 5.5. No supplementary use

Exhaustive NPIs and FCIs exhibit supplementary use (Horn 2005); but non-exhaustive NPIs do not. Regardless of what the proper analysis is, it suffices to see the asymmetry between exhaustive *any* and the Greek, Korean and Mandarin NPIs:

(64) Pick a card, any card!

(65) Pare mia karta, {*opjadhipote/#kamia*} karta! (Greek)  
 take.IMP.2SG one card, FCI/#NPI card  
 ‘Take a card, any card!’

(66) Tiao yi-zhang ka ba, {*renhe/#shenme*} ka! (Mandarin)  
 pick one-CL card PART FCI/#NPI card  
 ‘Pick a card, any card!’

(67) Khatu-lul hana kolla-la, {*etten-khatu-na/#etten-khatu-rato*}. (Korean)  
 card-ACC one pick-IMP FCI.card/#NPI.card  
 ‘Pick a card, any card.’

### 5.6. Felicitous appearance with universal modal verbs

Finally, exhaustive NPIs such as *any* and FCIs are known to be implausible with universal modal verbs (Giannakidou & Quer 2013; Menéndez-Benito 2010) (see (49)); but the Greek, Korean and Mandarin NPIs are fine in these contexts:

(68) a. #Ariadne must marry any lawyer.

b. #I Ariadne prepi na pandrefti opjondhipote dikigoro. (Greek)  
 the Ariadne must SUBJ marry.3SG FCI lawyer  
 Intended: ‘Ariadne must marry any lawyer.’

c. #Ta bixu dei jia gei renhe lvshi. (Mandarin)  
 she must necessarily marry for FCI lawyer  
 Intended: ‘She must marry any lawyer.’

(69) I Ariadne prepi na pandrefthi kanena dikigoro. (Greek)  
 the Ariadne must SUBJ marry.3SG NPI lawyer  
 ‘Ariadne must marry a lawyer, some lawyer of other.’

(70) Ta bixu dei jia gei shenme lvshi cai nen (Mandarin)  
 she must necessarily marry for NPI lawyer then can  
 jiejie jingjishangde kunnan.  
 solve financial trouble  
 ‘She must marry a lawyer, some lawyer of other (to avoid financial trouble).’

(71) Maria-nun {amwu/etten}-pyenhosa-hako-rato kyelhonhay-yahan-ta. (Korean)  
 Maria-TOP NPI.lawyer marry-must-DECL  
 ‘Maria must marry a lawyer, some lawyer of other.’

Notice, importantly, the use of supplementary *some or other* – which is intended to bring about the contrast in meaning with *any*. The empirical contrast between *kanena/shenme/rato*, which are felicitous with universal modals, and *any*, which is implausible in the same contexts, suggests again that it is empirically invalid to collapse the two kinds of NPIs. The contrastive behaviors of *kanenas/rato/shenme* versus *any* can be replicated with epistemic universal modals (see Giannakidou & Quer 2013; Giannakidou & Yoon 2016 for the relevant data).

## 5.7. Summary

In this section, we found that NPIs such as *any* that have been argued to be “exhaustive” – either in the Chierchia way via *O* (or a variant thereof), or by Giannakidou’s (2001) implicature of exhaustive variation – contrast sharply with the Greek, Mandarin, and Korean NPIs with respect to six widely used diagnostics. No implementation of the exhaustivity-for-all hypothesis that we know of is able to predict the differences we identified. The data presented here showed that Greek, Mandarin, and Korean NPIs resist exhaustified free choice readings. However we are to analyze the specific characteristics of each NPI paradigm, it should be evident that the description of Mandarin, Korean and Greek NPIs does not necessitate appeal to exhaustivity.

## 6. Conclusions

The most obvious conclusion from our discussion is that the exhaustivity-for-all hypothesis cannot be maintained as a principle of polarity. The empirical asymmetries identified between *any* and the non-exhaustified Greek, Korean, and Mandarin NPIs tell us that, even if we were to accept exhaustification as a semantic property of *any* (which we cannot, since NPI *any* has non-exhaustive interpretation at least in questions), for Greek, Korean, and Mandarin NPIs it is unreasonable to assume exhaustification in any form.

The hypothesis in (1), as implemented in the Chierchia program with the stipulations of covert  $O$  and  $\Sigma$ , was found to be inadequate to explain the distribution and interpretation of Greek, Korean, and Mandarin NPIs, and it was also empirically challenged as an account for *any*. A theorist of (1) might respond by saying that perhaps other factors obscure the effect of covert  $O$  and  $\Sigma$ , rendering it unobservable in Greek, Korean, and Mandarin NPIs. In that case, more stipulations would have to be added to derive the differences between *any* and these NPIs; and there appears to be no theory-internal filter on how complex the system can become. Chierchia & Liao (2015) is an example of the resulting complexity, while empirically affording too little since only a very small portion of the *shenme* data can be captured. Much of the *shenme* data presented here (and in the works cited) remain unreported in Chierchia and Liao. If one wants to maintain (1) as a hypothesis and account for the actual, vast, and diverse crosslinguistic and intra-linguistic data, one will end up building an unconstrained system with a proliferation of ad hoc rules and covert devices for each NPI paradigm, therefore with very little predictive power beyond each specific case. That alone would lead most researchers to the conclusion that a system that does not need that level of unlimited, *ad hoc*, yet not predictive complexity would be superior to a system that needs it.

The matter, I believe, is not simply about whether some variant of (1) can be constructed to handle the facts and contrasts discussed here. (Though this is also an obvious challenge for (1).) The matter is, perhaps primarily, about the role of empirical evidence in our linguistic theories, and how we want to proceed with theorizing, i.e., as a form of explanation or as a form of ideology. If the latter, we start with the assumptions and then fix the data in order to confirm the intended assumptions. But if our theories are proposed as explanations, we start with the data, and Ockham's razor serves as the golden standard: do not multiply theoretical constructs beyond necessity. Let us grant the (1) theorist that some con-

struct can be built in the future that will come close to capturing some of the facts presented here. That construct would have to be unnecessarily complex – and I say “unnecessarily,” because the facts under discussion can indeed have alternative explanations with fewer (or no) *ad hoc* stipulations. When presented with competing hypotheses about a set of data, the empirical scientist typically concludes that the hypothesis that makes fewer *ad hoc* assumptions and explains more data is preferable to the one that makes more such assumptions and explains less data.

The theory with fewer *ad hoc* assumptions and better empirical coverage, in this case, takes the data at face value, gives up (1), and posits that there is no single semantic source for NPIs and FCIs. This is the **diversity** theory (also known as **the landscape of polarity items**, after the title of Giannakidou 1997), which I have pursued in my own work since the mid-nineties, and has been further developed in the studies cited in this paper. Diversity posits that some NPIs are exhaustive (with free choice readings typically), and some are not (lacking free choice). Some NPIs have dependent variables and some do not. Some NPIs have a scalar component, others do not. The task in the diversity program is to specify a finite, and independently motivated, set of semantic and morphological properties of NPI and FCI classes, so as to make generalizations about the classes' distribution in the particular subsets of nonveridical contexts observed. Unlike (1) which needs to be augmented with case-by-case stipulations in order to get closer to the actual distribution, the diversity program can make predictions across languages based on the limited set of what can be thought of as possible “ingredients” of polarity-hood as these are extracted from observation of the various classes of NPIs.

Finally, the goal of  $O$  and  $\Sigma$ , as in any theory of polarity, is to account for the distribution of NPIs in (certain subsets of) nonveridical contexts – which means negative, modal, and inquisitive contexts. We saw that  $O$  and  $\Sigma$  fail to do that. Chierchia (2013) was unable to produce valid counterarguments to the thesis that nonveridicality – and not merely negation or downward entailment – is the property that unifies NPI and FCI licensers as a natural class. Therefore, the failure of  $O$  and  $\Sigma$  to predict *any* in nonveridical contexts can no longer be excused by downplaying the validity of the nonveridicality thesis.

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