Rullmann, Hotze 1997. *Even*, polarity, and scope. In: M. Gibson, G. Wiebe & G. Libben (eds.).
    Papers in Experimental and Theoretical Linguistics 4. Edmonton, AB: PETL, Department of
    Linguistics, University of Alberta, 40–64.
Russell, Bertrand 1905. On Denoting. *Mind* 14, 479–493.
Sauerland, Uli 2004. Scalar implicatures in complex sentences. *Linguistics & Philosophy* 27, 367–391.
Schein, Barry 1993. *Plurals and Events*. Cambridge, MA: The MIT Press.
Schein, Barry 2001. Adverbial, descriptive reciprocals. In: R. Hastings, B. Jackson & Z. Zvolenksy
    (eds.). *Proceedings of Semantics and Linguistic Theory (= SALT) XI*. Ithaca, NY: Cornell
    University, 404–430.
Strawson, Peter 1950. On referring. *Mind* 59, 320–340.
van der Wouden, Ton 1997. *Negative Contexts: Collocation, Polarity and Multiple Negation*. London:
    Routledge.
Zwarts, Frans 1998. Three types of polarity. In: F. Hamm & E. W. Hinrichs (eds.). *Plurality and
    Quantification*. Dordrecht: Kluwer, 177–238.

Elena Herburger, Washington, DC (USA)

64. Negative and positive polarity items

Abstract

*In this chapter, we discuss the distribution and lexical properties of common varieties of
negative polarity items (NPIs) and positive polarity items (PPIs). We establish first that
NPIs can be licensed in negative, downward entailing, and nonveridical environments, and
within the NPI class we distinguish two main distributional patterns: an NPI with a broad
distribution in the environments just mentioned, and a more narrow one appearing only
in negative contexts. We also note that within the broad class there are scalar and non-
scalar NPIs. We examine to what extent the scalarity approach (originating in Kadmon &
Landman 1993) can explain the basic patterns, and conclude that this approach, by
reducing all polarity phenomena to one source, fails to capture that a significant number
of NPIs and PPIs are not scalar, and that there is variation within the scalar class between
broader (any) and narrow NPIs (either, minimizers). Another fundamental problem with
pure scalarity is that it predicts weaker effects (contradictions, presupposition failures)
with ill-formed NPIs than is actually the case. We then consider the variation approach
pursued by Giannakidou (1998 and sequel) which posits two possible lexical sources of*

polarity: (a) scalarity (Giannakidou 2007a), which mostly yields weaker ill-formedness, and (b) referential deficiency of expressions that end up becoming NPIs. The variation approach is more consistent with the diversity of NPIs, and extends easily to PPIs, which, as a class, appear to be non-scalar (Szabolcsi 2004; Ernst 2009).

1. Introduction: common paradigms of polarity items and basic terminology

Polarity phenomena in natural language are pervasive. In this chapter, we study the properties of two of the most famous classes: 'negative polarity items' (NPIs) and 'positive polarity items' (PPIs). This first section offers the background necessary for our discussion, and introduces the terminology that will help identify NPIs and PPIs as distinct among other PI-paradigms.

1.1. Negative polarity items

NPIs are typologically very common (Haspelmath 1997 reports data from forty languages), and seem to exist in virtually every language we consider. Their hallmark property is exclusion from positive assertions with simple past (i.e., episodic sentences that make reference to a single positive event; Giannakidou 1997). English *any, ever,* Greek *tipota* 'anything', and Dutch *ook maar iets* 'anything' are well-known NPIs:

(1) a.   Bill didn't buy *any* books.
    b.   *Bill bought any books.   (versus: Bill bought {*War and Peace/*two books}).

(2) a.   *Bill has *ever* read *War and Peace*.
    b.   Bill hasn't ever read *War and Peace*.

(3) a.   Dhen   idhe *tipota*   o   Janis.   Greek
         not   saw   anything   the   John
         John didn't see anything.

    b.   *Idhe tipota o Janis.
          John saw anything.

(4) a.   Niemand heeft *ook maar iets*   gezien.   Dutch
         nobody   has   even something seen
         Nobody saw anything.

    b.   *Jan heeft ook maar iets gezien.
         *John saw anything.

Any, ever, ook maar iets, and *tipota* are ill-formed in positive episodic sentences, but become fine with negation (and their distribution is in fact much broader, as we see later). Importantly, *any, ever* and *ook maar iets* are scalar in the sense that they invoke a *widened* domain of quantification, or may contain *even* (*ook maar* translates as *even,*

as we see in the gloss above). Statements with scalar NPIs are usually strong, emphatic statements. Greek *tipota* is not scalar; rather a negative statement with *tipota* is weak (as opposed to an emphatic variant that we review later, and which is always emphatic; see Giannakidou 1994 and sequel).

The non-scalar NPI is a weak indefinite in that it always gets interpreted with narrow scope, and can never be used if the speaker has a specific object in mind (Giannakidou 1997, 1998; Giannakidou & Quer 2010). Such indefinites are said to have "low" referentiality (Partee 2008), and are labeled also *epistemically non-specific* (Haspelmath 1997), *extremely non-specific* (Farkas's 2002), or *referentially vague* (Giannakidou & Quer 2010). They are sensitive to 'knowledge of the speaker' and can only be used when the speaker does not know what their referent is. Such indefinites are referentially deficient also in that they are unable to introduce discourse referents on their own, as indefinites normally do (Giannakidou 1998). Referentially deficient NPIs are common crosslinguistically; besides Greek NPIs, similar distributions with NPIs are observed in Romanian (*vreun*; Farkas 2002; Falaus 2009), Salish (*ku*; Matthewson 1998), Navajo (*h…da*; Fernald & Perkins 2006), N-of-N structures in some Southern dialects of Dutch (van Craenenbrook 2008), and Korean *nwuku-(ila)to* NPIs (Yoon 2008). Scalar NPIs and non-scalar referentially deficient NPIs are the two main types that we find, and these will be the main object of study in this chapter.

NPIs belong to various syntactic categories: there are nominal NPIs, as the ones above, but also NPI adverbs (*ever,* Dutch *ooit;* Hoeksema 1999), NPI verbs (*hoeven, brauchen* in Dutch and German; van der Wouden 1994), NPI focus particles such as EVEN (Greek *oute*, Giannakidou 2007a; Spanish *nisiquiera* Herburger 2003, English *either*); and a class known as *minimizers* because they contain expressions of minimal amount (the earliest reference is Fauconnier 1975):

(5) a.   Bill isn't here yet.
     b.   *Bill is here yet.

(6) a.   I haven't seen Bill in years.
     b.   *I saw Bill in years.

(7) a.   Bill doesn't like pasta either.
     b.   *Bill likes pasta either.

(8) a. Je   hoeft niet te komen.   (Dutch)
        you   need   not   to come
        You need not come.

     b. *Je hoeft te komen.

(9) a. Dhen theli na dhi   *oute*   to idhio tou to pedi.   (Greek)
        not want3sg to see.3sg even.NPI   the self his the child
        He doesn't want to see even his own child.

     b. *Theli na dhi **oute** to idhio tou to pedi.
          #He wants to see even his own child.

(10) a.   Bill didn't lift *a finger* to help me.
     b.   She didn't say *a word* all night.

NPIs are said to be *licensed* (or *triggered;* Ladusaw 1980) by negation. Licensing normally says that the NPI must be in the scope of negation, and scope often translates into overt c-command:

(11) a.   ¬∃x. book (x) ∧ bought (bill, x)
     b.   ∃x. book (x) ∧ ¬ bought (bill, x)

(12) a.   *Any books Bill didn't buy.
     b.   Bill didn't buy any books.

Any books can only be interpreted inside the scope of negation, as in (11a) — the scoping in *b* is impossible. Furthermore, appearance to the left of negation, in a position where *any* is not c-commanded by negation is prohibited, though logically *any books* may still be in the scope of negation. Not all NPIs must be overtly c-commanded by their licenser, and language specific conditions can play a role, but this is certainly a strong tendency for (a subset of) NPIs. In this paper, our focus is on the semantics, and details of syntactic questions like overt c-command are put aside (see Giannakidou (1998: 232–242) for a semantic explanation for this tendency, by attributing it to the fact that NPIs cannot be topical: construals like (12a) are not possible because *any* would have to be interpreted as a topic, but it can't). For an attempt to reanalyze overt c-command as LF licensing, see Uribe-Etxeberria (1994).

1.2.   Free choice items

Free choice items (FCIs) are often thought of in relation to NPIs. Because of *any,* which exhibits both NPI and FCIs usage, attempts have been made to attribute NPIs and FCIs to a common source (Chierchia 2006). This dual usage, however, does not characterize all NPIs, certainly not the non-scalar, referntially weaker ones, hence attempts of unification are bound to face a number of empirical challenges, as we will see in the paper.

   FCIs express what Vendler (1967) called *freedom of choice*, a property manifested in the typical FCI use of *any* in generic sentences and with modal verbs:

(13) *Opjadhipote*   ghata   kinigai pondikia.   (Greek)
       Any   cat   hunts mice.   (English)

(14) *Opjosdhipote*   fititis   bori na lisi afto to provlima.   (Greek)
       Any   student   can solve this problem.   (English)

In Greek the FCI *opjadhipote* is distinct lexically from NPI *tipota* (Giannakidou 1998 gives the full paradigms). These sentences with FCIs are not about specific cats, so in this sense FCIs are also non-referential expressions. However, FCIs are usually scalar-marked, and require exhaustive variation (Giannakidou 2001) — properties also described as *domain widening* (Kadmon & Landman 1993), *indifference* (von Fintel 2000; Horn 2000a, 2000b), *domain vagueness* (Dayal 1998), *non-individuation* (Jayez &

Tovena 2005). Free choice is usually marked with special morphology — e.g., Greek –*dhipote*, and many languages follow the pattern of Greek with distinct lexicalizations of NPIs and FCIs (see Giannakidou & Cheng 2006; C. Lee 1997; Quer 1998, 1999; Vlachou 2007; Menéndez-Benito 2010 among others).

Importantly, FCIs are bad in both positive *and* negative sentences:

(15) a. *Idha   *opjondhipote*.   (Greek; Giannakidou 2001)
          saw.perf.1sg FC-person
          *I saw anybody.

     b. *Dhen   idha   *opjondhipote.*
          not   saw.perf.1sg   FC-person
          Intended: I didn't see anybody.

Unlike NPIs, FCIs remain bad with negation in an episodic (simple past) context. Giannakidou (1998, 2001) and Giannakidou & Cheng (2006) show that this fact characterizes FCIs in many languages, e.g., Spanish, Catalan, French, Chinese:

(16) * (Non) Expulsaron del   partido a   *cualquier* disidente. (Spanish; Quer 1999)
         not   expel.3pl   from-the party ACC FC   dissident
         Intended: *They expelled any dissident from the party.
         Intended: They didn't expel any dissident from the party.

(17) * (No) Li   va   comprar *qualsevol* ram.   (Catalan; Quer 1998)
         not   her/him aux.3sg to.buy   FC   bouquet
         Intended: *S/he bought him/her any bouquet.
         Intended: S/he did't buy him/her any bouquet.

But not all FCIs are polarity sensitive; e.g., German *irgendein* (Kratzer & Shimoyama 2002) is fine in positive episodic contexts, and so is English *wh-ever* (Horn 2000a, 2005):

(18) a. *Irgendjemand*   hat angerufen.   (Kratzer & Shimoyama 2002: (6))
          irgend-one   has called

     b. * Opjosdhipote tilefonise.   (Greek)

(19) a. Bill bought *whicheve*r book he liked.
     b. *Bill bought whichever book.

Indeed, looking across languages, one finds variation in FCIs with respect to their status as polarity items — though the majority does seem to exhibit polarity sensitivity. I am not going to discuss how FCIs come to be polarity sensitive (see Giannakidou 2001; Giannakidou & Cheng 2006); rather, we consider FCIs only in order to compare to NPIs when it comes to assessing the idea that they are due to the same source (in particular, widening or scalarity). Given that FCIs remain bad with negation, we must hypothesize that NPIs and FCIs, as classes, cannot be sensitive to the same thing.

1.3.   Positive polarity items

Affirmative PIs, or positive PIs (PPIs) are expressions that are 'repelled' by negation and tend to escape its scope. PPIs were first identified as a class in Baker (1970), and are discussed more recently in Szabolcsi (2004), Nilsen (2003), and Ernst (2009). Expressions like *some, already, would rather,* and speaker oriented adverbs have been identified as PPIs in the literature:

(20) a.   Bill didn't buy some books.
     b. $\exists$x. book (x) $\wedge \neg$ bought (b, x)

(21) a.   Bill would rather be in Montpellier.
     b.   #Bill wouldn't rather be in Montpellier.

(22) a.   John is here already.
     b.   #John isn't here already.

(23) a.   Unfortunately, John died.
     b.   #John didn't unfortunately die.

As we see, *some books* exhibits the scope outside negation that *any* lacks, and only that. *Would rather* and *already* are also odd with negation, and likewise *unfortunately*. (Only metalinguistic denial — which is *not* regular negation (Horn 1989) — can rectify them, and see Ernst 2009 for discussion.) This contrasting behavior of NPIs and PPIs prompted analyses of PPIs as *anti-licensed* by negation (Giannakidou 1997, 1998; Progovac 1994; also Ladusaw 1980), but recently attempts have been made to reformulate anti-licensing as a positive condition (Szabolcsi 2004; Giannakidou 2006).

1.4.   Roadmap

Polarity phenomena are significant because they provide a case of well-formedness that is not fully determined by syntax: the distribution of NPIs is not predicted by their syntactic category alone, and they seem to be sensitive to semantic factors of the sentence (roughly at this stage, the presence or not of negation). This sensitivity addresses the fundamental relation between syntactic and semantic well-formedness, and polarity thus provides a uniquely complex domain to investigate the relation between syntax and semantics, and the nature of semantic knowledge.

   In this chapter, we examine the distribution and meaning of NPIs and PPIs, in the light of the issues that have determined the research in the past 30 years: distributional variation (within and across languages), mode of sanctioning (licensing, anti-licensing), and how the lexical semantics of the PI relates to its limited distribution. These foundational issues are presented in section 2. In section 3, we examine the basic distribution patterns of NPIs and see that NPIs are licensed in negative, downward entailing and nonveridical contexts (which may be upward entailing). In section 4, we discuss the notion of nonveridicality in more detail and show a correlation between mood and NPI licensing that concerns both scalar and non-scalar NPIs. In section 5 further we single out a class within NPIs that is licensed more narrowly in negative contexts. In section 6,

we revisit the broad NPI class that appears in nonveridical contexts, and show that within this class, there is an NPI type, notably illustrated by English *any* and minimizers, that can appear in *veridical and non-DE* contexts. We propose this NPI is not actually licensed in these cases, but *rescued* by a global negative inference. In section 7 we discuss the scalarity approach to NPIs, and conclude that it is inadequate empirically and conceptually as a general theory of NPIs. In section 8, we identify low referentiality as a possible lexical source of NPIs, and define a class of NPIs that contain variables that cannot be used deictically. This is a widely attested class crosslingustically. In section 9, finally, we examine PPIs. We follow Ernst (2009) in acknowledging that the scalar approaches face problems when it comes to characterizing PPIs and PPI-variation. An approach based on veridicality and speaker commitment is argued to be more successful in this respect.

2. Core questions about polarity: sanctioning, variation, and sensitivity

NPI licensing has been a central issue in linguistic theory, and indeed one that has received considerable attention since Klima's (1964) seminal work on English negation. In the earlier works, the focus was on English NPIs, but recent crosslinguistic studies extended the empirical domain of polarity, and made obvious a complexity that in the earlier works went unnoticed.

The central theoretical task in most theories of polarity in the past 30 years has been to delimit the set of potential NPI-licensers. This is known as the *licensing* question (Ladusaw 1996). In order to be able to predict if an expression can act as a licenser or not, we have come to expect a coherent characterization of the set of expressions that can *possibly* allow PIs within and across languages. There have been two main approaches to the licensing question: a pragmatic one based on negation, and a semantic one. The pragmatic approach, best represented by Baker (1970) and Linebarger (1980, 1987, 1991) claims that *all* licensing is done by negation, either by entailment (with negation), or (conventional or conversational) implicature, when there is no negation in the sentence. Linebarger also proposes that NPIs must be in the *direct* scope of negation (Linebarger 1987), excluding PIs when "harmful" material intervenes between negation and PI; these cases are known as *intervention* phenomena and will not be discussed in the present paper for reasons of space (see Jackson 1994, however, for a good overview).

The semantic approach originates in Ladusaw (1980), and is further developed in Zwarts (1995), von Fintel (1999), and Giannakidou (1994, 1995, 1997, 1998, 1999, 2001, 2002, 2006). It maintains that the set of possible NPI licensers must include expressions that are negative, downward entailing (DE, Ladusaw; or Strawson D; von Fintel 1999), and nonveridical — in this case often without being negative or DE (Giannakidou, Zwarts). In sections 3 and 4 we define these terms precisely.

A second important question concerns the *status* of illicit NPIs. Polarity, as mentioned earlier, raises the question of well-formedness that is not purely determined by syntax. If not purely syntactic, then what is the nature of polarity ill-formedness? Since Ladusaw, the intuition has been that sentences with failed NPIs, e.g., **Bill brought any presents, *Bill talked to John either,* are unacceptable in a sense stronger than mere lexical anomaly, or presupposition failure.

(24) a.   #The king of France arrived yesterday.
     b.   #Jason has a population of 3 million.

Here we have a presupposition failure and a category mistake (people cannot have populations), and the sentences are perceived as odd, though we can almost figure out what they mean (e.g., *If Jason were a city, then it would have the population of 3 million*, and likewise, *If France had a King then that person could have visited the museum yesterday*). Ill-formed *any, tipota, ook maar,* and similar NPIs, on the other hand, are odd in a qualitatively different way. But how exactly?

In the more than thirty years of research on polarity, with a few exceptions (Ladusaw 1996; Giannakidou 1998, 2001), scholars were eager to ignore the status question. Ladusaw in his dissertation certainly thought that *any* failures are not mere pragmatic oddities, and presented polarity conditions as cases of grammatical *semantic well-formedness* (see also Ladusaw 1983). Recently, on the other hand, the tendency has been to view NPI ill-formedness as pragmatic infelicity or, as Chierchia puts it, 'logical failure' (Lahiri 1998; Krifka 1995; Chierchia 2006; van Rooy 2003). In these approaches, NPI failures are typically reduced to presupposition failures or contradictions. However, recent processing evidence suggests that polarity failures have stronger psychological status mere lexical anomalies (Saddy at al. 2004; Drenhaus et al. 2006; Drenhaus, Blaszczak & Schütte 2010. This research finds a biphasic N400/P600 pattern with violating conditions of NPIs, suggesting that the processing of NPIs is linked to syntactic and semantic factors: roughly, the N400s reflect the attempts to integrate the NPI semantically, and the P600 manifests the processing cost relating to syntax. These results, though to some extent inconclusive, challenge the idea that NPI failures are mere presupposition failures or contradictions, and at any rate call for caution when it comes to deciding what kind of explanation for the NPI-distribution one must look for. We will come back to the questions of status when we discuss the pragmatic theories later in section 7.

Finally, a third important question concerns compositionality: for a given PI-paradigm, what exactly is responsible for the limited distribution we see? This question prompts a close examination of the lexical contribution of individual classes of NPIs, but in the earlier days polarity conditions were postulated as global, composition external filters on sentences (or grammatical representations), without recourse to the lexical meaning of the NPI. (Another case of such global filtering were the principles of binding theory). For instance, *semantic filtering* (Ladusaw 1983) claims that a syntactically well-formed structure with *any* will be filtered out semantically, because *any* is subject to a semantic licensing condition (it requires negation), and this condition is not satisfied if there is no negation. Why *any* is subject to this condition is not explained, but is merely stipulated.

In current theorizing, the idea of global semantic filtering is unsatisfactory. Instead, we want lexical motivation for the observed licensing rules; we want to understand how the lexical content of a given PI is responsible for its limited distribution. In the new agenda, the polarity status is no longer stipulated but follows from compositional processes*,* and PIs are no longer "special" or mysterious, but manifestations of properties and phenomena whose existence is independently motivated in the grammar. Recent examples of theories inspired by this goal are: Kadmon & Landman (1993), Lee & Horn (1994), Krifka (1995), Israel (1996, 2004, Lahiri (1998), Tovena (1998), Giannakidou (1998, 2000, 2001, 2007), Chierchia (2006). A view of sensitivity has emerged where PIs are 'deficient'

because they contain, or lack, components in their meanings, thereby creating more demands on the environments of occurrence.

Having outlined these important foundational issues, we now go back to *any* and the Greek and Dutch NPIs we introduced earlier, and take a closer look at their distribution.

3. NPI-licensing and downward entailment

There is indeed a class of NPIs (to be discussed in section 5) whose distribution is limited to mainly negative contexts. The distribution of *any*, however, exceeds negation by far. I proceed to show this incrementally. First, *any* is fine in the scope of *few* (the IP c-commanded by *few professors*), and in the NP argument (i.e., the restriction) of the universal quantifier *every*:

(25) a.   Every [student who saw anything] contacted the police.
     b.   {Few professors/*Many professors} invited any students.

The restriction of *every*, especially, makes a remarkable case against negation being the key factor in the appearance of *any*. *Any* also appears in questions, and in *if*-clauses:

(26) a.   If you say anything about this, I'll be very upset.
     b.   Did you see anybody?

Klima (1964) coined the term "affective" to unify descriptively negation, questions, and the other environments where *any* occurs, but "affective" remains merely a descriptive label in Klima. Real progress beyond that was made with Ladusaw (1980) who argued that there is an underlying semantic property characterizing all affective contexts: downward entailment (DE).

3.1. Downward entailment, and degrees of negativity

Ladusaw proposed the following licensing condition for NPIs:

(27) *Ladusaw's (1980) licensing condition*
     α is a trigger for negative polarity items in its scope iff α is downward entailing.

Trigger is the expression in the sentence that is needed to make the NPI legitimate, i.e., the *licenser* of the NPI. Unlike upward entailing (UE) functions, which are order preserving and closed under supersets, DE functions are order reversing and closed under subsets. Both are illustrated below (the definitions rely on Zwarts 1986; Giannakidou 1998):

(28) A function f is upward entailing iff for every X,Y: if $X \subseteq Y$, then $f(X) \subseteq f(Y)$

(29) A function f is downward entailing iff for every X,Y: if $X \subseteq Y$, then $f(Y) \subseteq f(Z)$

UE functions support inference from sets to supersets, and DE functions support inference from sets to subsets. In DE contexts, expressions denoting sets can be substituted

for expressions denoting subsets *salva veritate*. Negation, *few students* and the restriction of *every* are DE:

(30) a Lucy does not like linguistics.
    $[\![\text{syntax}]\!] \subseteq [\![\text{linguistics}]\!]$

    ─────────────────────────────
    ∴ Lucy does not like syntax.

   b Few students like linguistics.
    $[\![\text{syntax}]\!] \subseteq [\![\text{linguistics}]\!]$

    ─────────────────────────────
    ∴ Few students like syntax.

(31) Every [student who likes linguistics] came to the party.
    $[\![\text{student who likes syntax}]\!] \subseteq [\![\text{student who likes linguistics}]\!]$

    ─────────────────────────
    ∴ Every student who likes syntax came to the party.

DE thus appears to capture the occurrence of NPIs with negation and in the restriction of *every*. This was a remarkable result, and DE initiated a fruitful research program for semanticists (Hoeksema 1986; Zwarts 1986, 1993; van der Wouden 1994; Kas 1993; Dowty 1994; among many others); one also finds references to licensing environments as non-UE (Postal 2000; Progovac 1994).

    Zwarts (1993), further, conceptualized all DE as *minimally* negative in that they satisfy the first and fourth of de Morgan relations, and he defined within this class more *strongly* negative functions: antiadditive and antimorphic ones. Antiadditive functions satisfy the first de Morgan biconditional. Antimorphic functions, on the other hand, convey *classical* negation in Zwarts's terminology and satisfy all four of the de Morgan relations; sentence negation is thus antimorphic:

(32) Downward entailment   (a) $f(X \cup Y) \rightarrow f(X) \cap f(Y)$
                                  (b) $f(X) \cup f(Y) \rightarrow f(X \cap Y)$

    Antiadditivity   (a) $f(X \cup Y) \leftrightarrow f(X) \cap f(Y)$
                                  (c) $f(X) \cup f(Y) \rightarrow f(X \cap Y)$

    Antimorphicity   (a) $f(X \cup Y) \leftrightarrow f(X) \cap f(Y)$
                                  (d) $f(X) \cup f(Y) \leftrightarrow f(X \cap Y)$

Antiadditive functions are a subset of the DE, and antimorphic functions are a subset of the anti-additive. A DE quantifier like *few* is not antiadditive, but *nobody* is. Depending on whether they are licensed by DE, antiadditive or antimorphic expressions, Zwarts distinguishes between *weak, strong*, and *superstrong* NPIs. *Any* is weak in this system because it is licensed by *few,* but the Dutch *ook maar iets* (that we saw at the beginning of the chapter) is strong: it is not licensed by *weinig* 'few' and needs *niemand* 'nobody':

(33) a. *Weinig mensen hebben   ook maar iets gezien.   (Zwarts 1981)
         few   people   have.3pl   anything   seen
         Few people saw anything.

     b. *Niemand* heeft   ook maar iets gezien.
         nobody   have.3pl   anything   seen
         Nobody saw anything.

Van der Wouden (1994) further mentions a class of collocations that require antimorphic negation, i.e., idioms like *voor de poes* in Dutch, which can only occur in with negation: *niet voor de poes zijn* "to not be considered lightly". In this tradition, the shared enthusiasm has been that we can characterize semantically the class of NPI-licensers, and that within that class we can neatly establish varying degrees to sensitivity to stronger or weaker forms of negation. The facts however, are not as neat because, as we see next, not all environments where NPIs appear can be described as DE.

3.2. Problems with DE: NPIs appear in non-DE contexts

Critiques of DE are to be found in numerous places in the literature starting with Linebarger 1980; I will mention here also Zwarts (1995), Giannakidou (1997, 1998, 2006), and van Rooy (2003). Linebarger's criticism aimed to show that an entailment based approach to NPIs is simply untenable (see Giannakidou 2006 for addressing some of Linebarger's concerns). From our current perspective, the main conceptual problem with both the old-style Ladusaw and the refined Zwarts style DE-condition is, as mentioned earlier, that they are merely stipulated as global, composition external filters on representations that contain PIs; why NPIs are subject to DE-based licensing rules remains a mystery. Most accounts within this earlier tradition limit their analytical goal to simply positing licensing conditions.

   In this section we focus on the main empirical problem: DE does not predict the correct set of licensing environments in English or crosslinguistically, and it is not flexible enough to capture the variation attested.

3.2.1. Non-uniform and unexpected licensing in the restrictions quantifiers

Though DE appears to explain nicely the occurrence of NPIs in the restriction of *every,* the distribution of NPIs in the restrictions of quantifiers is factually more complex. First, we find a contrast between the restriction of *every*, which allows *any*, and the restriction of *each* and *both*, which doesn't (Giannakidou 1997, 1998); for earlier notes see also Horn (1972), Seuren (1984):

(34) {Every student/the students} who saw anything reported to the police.

(35) a. */??Each student who saw anything reported to the police.
     b. */??Both students who saw anything should report to the police.

(Greek NPIs behave exactly the same). This asymmetry is problematic for DE which predicts uniform licensing in universal restrictions, and Giannakidou (1997, 1998, 1999)

argued that the contrast follows if we consider that *each* and *both*, but not *every*, are pre-suppositional. Presuppositional determiners can only be defined in non-empty domains. *Every* has no such restriction and can be used in a context that allows an empty domain (for more details see Giannakidou 1998, 1999). The non-sanctioning with *each/both* then suggests that, for NPIs, it is not DE that matters, but whether or not there exists a nonempty domain.

Israel (2004) further observes (and see Sailer 2009 for more recent discussion) the following data, supporting again the correlation between NPIs in the restriction and (non) existentence:

(36) a. *Most* children with *any sense* steal candy.
     b. *Most* people who would *lift a finger* to help Bill now are either very foolish or very well-paid.

We see here that *most* too can license an NPI in its restriction — despite that it is not DE. For *most* to license NPIs, it must be used generically — these are law-like contexts where the existential commitment of *most* gets suspended. These data support what we just observed about *every* versus *each/both*, and are problematic if we assume that DE is all that we need to account for NPIs in restrictions of determiners. Giannakidou (1998: Ch. 3) finally discusses certain specificity effects that can be understood as pointing in the same direction, and see also Hoeksema 2010 for data from Dutch suggesting the role of non-existence in the restriction.

3.2.2. NPIs in questions

DE cannot explain the occurrence of NPIs in questions. It is very hard to establish monotonicity patterns in questions, and to my knowledge, there has been no successful attempt to do this, a difficulty noted already by Ladusaw (see also Guerzoni & Sharvit 2007). This is a serious empirical problem, as NPIs are very common in questions: in virtually every language that can be identified to have an NPI with distribution that exceeds negation, the minimal extension is questions. I illustrate below with Greek and Dutch:

(37) a. Heb   je   ook maar iets gezien?   (Dutch)
         have.2sg you anything   seen
         Did you see anything?

     b. Idhes   tipota?   (Greek)
         saw.2sg   anything
         Did you see anything?

The Dutch *ook maar iets*, and the Greek *tipota* are fine in information questions (and with no negative bias), while *not* being licensed by the equivalents of *few:*

(38) a. */??Liji anthropi idhan   tipota.   (Greek)
         few   people   saw.3pl   anything
         Few people saw anything.

b. * To poli 5   anthropi idhan tipota.
    At most five people saw anything.

c. *Weinig mensen hebben ook maar iets gezien.
    Few people saw anything.

The non-occurrence of *ook maar iets* and *tipota* with a DE quantifier, and their improvement with questions challenges the assumption that these items are sensitive to DE, and the attempt to render them strong NPIs fails: a strong NPI, according to Zwarts, is expected to occur in antiadditive environments only, but questions are not DE, let alone not antiadditive. Things become worse next, when we consider modal and other non-DE contexts.

3.2.3. Modal and other non-DE enviroments for NPIs

NPIs appear in imperatives, with modal verbs, subjunctive complements of propositional attitudes, habituals, and disjunctions (Giannakidou 1994, 1995, 1998, 1999, 2006). I illustrate with Greek and English *any* in order to keep things simple, but similar observations are reported for NPIs in Salish (Matthewson 1998), Chinese (Lin 1996), Navajo (Fernald & Perkins 2006), Russian (Haspemath 1997; Pereltsvaig 2000), Ossetic (Haspelmath 1997), Hindi NPIs (Lahiri 1998), N-of-N NPIs in southern Dutch dialects (van Craenenbrok 2008), and Romanian *vreun* NPIs (Farkas 2002; Falaus 2009), to mention just some of the paradigms.

(39) a. Patise   {kanena/opjodhipote} pliktro.
          press.imperative   any key
          Press any key.

b. O Janis bori na milisi   me {kanenan/opjondipote}.
    the John may subj talk.3sg   with anybody
    John may talk to anybody.

c. O Janis ine prothimos na milisi   me {kanenan/opjondipote}
    the John is willing subj talk.3sg with anybody
    John is willing to talk to anybody.

Modal environments are known to be non-monotone. We talk more about the licensing of NPIs with propositional attitudes in section 4, but notice here that in Greek both the non-scalar NPI and the FCI are good in modal contexts. In other words, it is not just FCIs that we find in imperatives, with modals verbs and propositional attitudes.

    Another problematic case for DE is the conditional. I illustrate below with *any* as well as the Greek NPIs and FCIs, to make clear that it is not just a free choice effect that we observe:

(40) An kimithis me   {opjondhipote/kanenan} tha se   skotoso.
     if   sleep.2sg with FCI-person/NPI-person FUT you kill.1sg
     'If you sleep with anybody, I'll kill you.'

Heim (1984) noted the problem with classic DE in conditionals. If the set of situations where one *goes to Spain and has a car accident* is a subset of the set of situations where one *goes to Spain,* it becomes problematic to infer from *If you go to Spain you will have a good time* that *If you go to Spain and have a car accident you will have a good time.* Heim herself suggested that we can maintain DE if we strengthen pragmatically the antecedent, and the line of pragmatically restoring DE is later taken on in von Fintel (1999). However, Giannakidou (2006) shows that if we allow pragmatic reasoning to determine DE, we make too broad predictions—and we lose one of the most appealing features of the Ladusaw-Zwarts approach: that NPIs are sensitive to semantic properties of the environment of occurrence.

Another non-negative and non-DE NPI-environments is the habitual. Giannakidou (1995) noted that Greek NPIs and FCIs appear in habitual sentences with Q-adverbs of varying force (meaning *often, rarely, sometimes, never*). In Greek, the habitual sentence Greek contains imperfective aspect:

(41) I Eleni dhiavaze sinithos   {kanena/opjodhipote}   periodhiko (otan
                                                       variotane).
    the Ellen read.imperf.3sg usually   NPI/   FCI   magazine
    Ellen used to read {some magazine or other/any magazine} when she was bored.

The ambiguity of the English simple past, which allows perfective and habitual readings, may help improve *any*, if speakers understand the sentence as habitual, as indicated above. And we also see here that the NPI appears in the scope (the main VP) of the clause, not the restriction. We also see in the example above that NPIs as well as FCIs appear in habitual sentences with Q-adverbs. FCIs additionally appear without Q-adverbs with generic readings (unlike Greek NPIs, which cannot refer to kinds; Giannakidou 1997).

Finally, NPIs occur in disjunctions (Giannakidou 1998):

(42) a. I bike mesa   kanenas   i   afisame to fos anameno.   (disjunction)
       either entered.3sg NPI   OR left.1pl the light on
    (??/#Either anybody came in OR we left the light on.)

    b. *Bike mesa kanenas   ke   afisame to fos anameno.   (conjunction)
       * Anybody came in AND we left the light on.

(Notice here the asymmetry with *any*, discussed in Giannakidou 1999, 2006.) The occurrence of NPIs in disjunctions but not conjunctions is very unexpected from the point of view of negation or DE, and suggests a role of veridicality for NPI-licensing: disjunctions are nonveridical, but conjunction is veridical (it requires that both conjuncts be true; Zwarts 1995).

I summarize below the broad distribution of NPIs, *any* and FCs, some of which I illustrated here. The Tab. 64.1 relies on Giannakidou 20

Rows 1–17 are the core polarity data an adequate theory of polarity must explain. Notice that, of these environments, only the restriction of universal quantifiers, DE quantifiers (which are *not* licensers in Greek), and negation are DE, the rest are not.

Tab. 64.1: Comparative distribution of broad NPI, FCI and 'any' sanctioning environments

Environments	any	Broad NPI	Free choice item
1. Episodic negation	OK	OK	*/#
2. Episodic yes/no question	OK	OK	*/#
3. Conditional (*if*-clause)	OK	OK	OK
4. Restriction of *every/all*	OK	OK	OK
5. (Non-antiadditive) Downward entailing Q	OK	*	*
6. Modal verbs	OK	OK	OK
7. Directive attitudes (e.g., *want, insist, suggest, allow*)	OK	OK	OK
8. Imperatives	OK	OK	OK
9. Habituals	OK	OK	OK
10. Disjunctions	*	OK	OK
11. *isos/perhaps*	*	OK	OK
12. Stative verbs	OK	*	OK
13. *prin/before* clauses	OK	OK	OK
14. NP Comparatives	OK	*	OK
15. *monon/only*	OK	*	*
16. Emotive factive verbs	OK	*	*
17. Episodic past sentences	*	*	*
18. Positive existential structures	*	*	*
19. Epistemic attitudes (e.g., *believe, imagine, dream, say*)	*	*	*
20. Progressives	*	*	*
21. Non-emotive factives (e.g., *know, remember*)	*	*	*

Before moving on to nonveridicality, let me again emphasize that the broader distribution of the Greek NPI is not a peculiarity of Greek and English *any*, but is found in various languages. In many cases we are dealing with non-scalar NPIs that belong to the decreased referentiality class that we mentioned at the beginning (especially in Greek, Salish, Navajo, Chinese, Romanian; but not in Hindi, English). Now we move on to nonveridicality as the property unifying negation and these non-negative, non-DE licensing environments as a natural class.

4. NPI-licensers as a natural class: from downward entailment to nonveridicality

In philosophy, the term *veridicality* is related to truth and sometimes existence (as in Montague 1969). Giannakidou (1994 and sequel) and Zwarts (1995) propose that the main distributional fact about NPIs is that they are excluded from veridical sentences and are allowed in nonveridical ones, and define the notion in terms of truth.

4.1.   Main definitions

Veridicality is a property of sentence embedding functions: such a function *F* is veridical if *Fp* entails or presupposes the truth of *p*. If inference to the truth of *p* under *F* is not possible, *F* is nonveridical. More specifically, veridical operators express certainty

and an individual's commitment to the truth of a proposition, but nonveridical expressions express uncertainty and lack of commitment. Within the class of the nonveridical expressions, negation is identified as ANTI-VERIDICAL in that *NOT p* entails that *p* is false.

The intuitive idea behind veridicality and nonveridicality is very simple: a linguistic item L is veridical if it expresses certainty about, or commitment to, the truth of a sentence; and L is nonveridical if it doesn't express commitment. For example, if *We know that Bill left* then *Bill left* is true — in fact *Bill left* is not simply entailed in the context, but presupposed to be true, i.e., it is part of the context's common ground. Hence all factive verbs are veridical. But if it is true that I have a desire that *Bill leaves*, I am not committed to the truth of *Bill leaves*. From this intuitive description, we see immediately that veridicality and nonveridicality correlate with the two basic categories of the indicative selecting verbs (factives), and the subjunctive ones (volitionals). In Giannakidou (1998) and (1999) I developed a formal system that described these distinctions, and I will reproduce part of that discussion here.

The notion of certainty and uncertainty that I employ here is one of epistemic assessment, and epistemic assessment itself relies on an *individual* assessing whether the proposition denoted by a sentence is true or false. This individual is the *individual anchor* (Farkas 1992; Giannakidou 1998, 1999), and I made the assumption that *every sentence*, embedded or not, is true or false with respect to an individual. An unembedded sentence will be assessed as true or false with respect to the speaker. With propositional attitudes (which are propositional operators, a treatment originating in Hintikka 1962), we have two possible individual anchors for truth assessment: the speaker, as in the unembedded sentence, and the attitude subject; and the complement sentence may be true or false depending on whose perspective we take.

In my earlier work, I added to the context 'models of individuals'. These models represent the doxastic state of individuals, as in the philosophical tradition where belief and knowledge states are modeled as sets of possible worlds in terms of accessibility functions relative to individuals (see Hintikka 1962 and Heim 1992, among many others).

(43) *DF*1: Model of an individual   (Giannakidou 1999: (44))
       Let c= <cg(c), W(c), M, s, h, w_0, f,…> be a context.
       An model M(x) ∈ M is a set of worlds associated with an individual x; x is the individual anchor.

The context assumed in this definition is Stalnakerian. It is a tuple consisting of a common ground (cg(c)), a context set W(c), i.e., the set of worlds in which all the propositions in the cg(c) are true (i.e., it is the set of worlds compatible with that is believed to be true by the agents of the conversation prior to any assertion), an assignment function *f*, and a number of what Condoravdi calls *Kaplanian* (Condoravdi 1994) parameters such as the speaker *s*, the hearer *h*, the actual world w_0, and possibly other parameters. Models are construed as collections of worlds in *c*, corresponding essentially to the accessibility functions what we know from the treatment of attitudes in modal logic and possible world semantics. (Farkas 2003 uses the similar function "worldview").

In the simplest case, i.e., for an unembedded assertion, and for sentences embedded under epistemic verbs as we shall see later, M(x) stands for an individual's belief state: it represents the epistemic status of that individual, and it includes worlds compatible with

what x believes in the actual world. This is captured in the definition below, where M(x) is indexed with B:

(44) *DF* 2: Belief model of an individual   (Giannakidou 1999: (45))
    Let c= $<cg(c), W(c), M, s, h, w_0, f,...>$ be a context.
    An model $M_B(x) \in M$ is a set of worlds associated with an individual *x* representing worlds compatible with what x believes.

The proposition *p* of an unembedded assertion will be evaluated with respect to the speaker's model, naturally:

(45) a   John won the race.
    b $[\![$ John won the race $]\!] = 1$ iff
         $\forall w [w \in M_B (s) \to w \in \lambda w'.$John wins the race in $w']$

This tells us that if the speaker decides in a context to truthfully assert the sentence *John won the race*, (s)he must believe that John won the race, which means that all worlds in his model M_B (s) are *John-won-the race* worlds. Hence: $M_B(x) \subseteq p$:

(46) *DF*3: Truth in an epistemic model
    A proposition p is true in an epistemic model $M_B(x)$ iff:
    $\forall w [w \in M_B (x) \to w \in \lambda w'.p (w')]$

So, unembedded assertions expresses speaker commitment. This is formalized in some recent works (e.g., Alonso-Ovalle & Menendez-Benito 2010) by introducing an implicit assert operator in the syntax that brings in the $M_B(x)$, but in Giannakidou (1998, 1999), $M_B(x)$ remains a parameter of evaluation that is not syntactically present. The question of whether $M_B(x)$ needs to be syntactically present or not parallels the debate about whether the *judge* (Lasersohn 2005), the individual anchor for predicates of personal taste, must be represented syntactically as a covert pronoun (as in Stephenson 2007) or not. The debate is not central to what we discuss here though, so I leave it aside.

    Unembedded positive assertions in the simple past, then, like *John won the race,* are veridical. We are now ready to definite the notion:

(47) *DF*4. (Non)veridicality for propositional operators (following Giannakidou 2006)
        i. A propositional operator *F* is veridical iff *Fp* entails or presupposes that *p* is true in some individual's model M(x); p is true in M(x), if $M(x) \subset p$.
       ii. If (i) is not the case, *F* is nonveridical.
      iii. A nonveridical operator *F* is *anti*veridical iff *Fp* entails *not p* in some individual's model: iff $M(x) \cap p = \varnothing$

Given that a proposition *p* is true in a model M(x) iff it is true in all worlds in M(x), *DF*4 says that an expression *F* will be veridical if the proposition of the sentence F embeds is universally true in all worlds in M(x). So veridical operators express an individual's commitment to the truth of a proposition. When this is the case, no NPIs will be licensed.

Nonveridical expressions, on the other hand, lack truth commitment: it is not the case that all worlds w in M(x) are p-worlds. This is typically what we get with volitional and future oriented predicates, questions, disjunctions, modal verbs, subjunctive taking verbs—all licensing environments for NPIs.

Within the class of the nonveridical functions, negation is identified as ANTI-VERIDICAL: assertion of *NOT p* requires that the set of worlds in M_B(speaker) and the p worlds are disjoint:

(48) *Antiveridicality* of negative assertion

⟦not p⟧ is true in M_B(speaker) iff M_B(speaker) $\cap$ p $=\varnothing$

Negation, a prototypical NPI-licenser is antiveridical. Giannakidou (1998) used the term *averidical* (with Greek *a-* meaning *without*) for non-assertive sentences such as imperatives and questions because for their assessment we do not use the concepts or truth or falsity, hence they lack veridicality. Since then, I am using the term nonveridical to include the nonveridical and averidical cases, because the latter too, strictly speaking, do not require satisfaction of clause (i), i.e., truth in a speaker's model.

I showed in my earlier work that nonveridicality is relevant for NPIs, FCIs, as well as mood choice (at least in Greek). I should mention also that Quer's (1998, 2001) account of mood in Spanish and Catalan implements the notion of model that I define here, and suggests that the availability of multiple models is the key to explaining mood shifts in Romance. An interesting case where we see the workings of nonveridicality is the interaction between NPI licensing and propositional attitudes. It will be helpful to consider the main facts here because they tend to not be discussed much.

4.2. Propositional attitudes and NPI licensing

Giannakidou (1995, 1998, 1999) observes a correlation between mood choice and NPI licensing in Greek: NPIs appear in subjunctive complements (*na*) of propositional attitude verbs that are *directive* (meaning *want, ask, suggest* and the like), but are excluded from the indicative (*oti*), complements of epistemic, factive, and similar verbs:

(49) I Ariaδni epemine   na afiso {opjonδipote/kanenan} na   perasi mesa.
    the Ariadne insisted.3sg   subj let.1sg FC-person/NPI-person subj come.3sg in
    'Ariadne insisted that I allow anyone in.'

(50) I Ariaδni θa iθele   na milisi me {opjonδipote/kanenan} fititi.
    the Ariadne would like.3sg   subj talk.1sg with FC- /NPI-   student
    'Ariadne would like to talk to any student.'

(51) a. * O   Pavlos pistevi   oti idhe {kanenan/opjonδipote}.
          the Paul believe.3sg   that saw.3sg NPI/FCI
         * Paul believes that he saw anybody.

    b. * Kseri   oti   aγorasa   {kanena/opjoδipote} aftokinito.
          know.3sg   that   bought.1sg NPI/FCI   car
         * He knows that I bought any car.

This correlation is found in most of the languages that possess this type of broad NPI, even if there is no formal subjunctive-indicative distinction; and notice that *any* too is fine in the (infinitival) complements of *would like, insist*, while it is out in *that* clauses of epistemic and factive verbs.

(52) a.   John would like to invite any student.
     b.   John asked us to invite any student.
     c.   John is willing to invite any student.
     d.   I insist that you allow anyone in.

(53) a.   *John believes that we invited any student.
     b.   *John dreamt that we invited any student.

Giannakidou (1998, 1999) argues that epistemic and factive attitudes are veridical. For *x believes that p* to be true, it must be the case that *x*, the main clause subject, is committed to the truth of the embedded proposition *p*. Though the speaker might disagree, a prerequisite for *p* to be true is that Jacob's epistemic model (i.e., the set of worlds compatible with what Jacob believes) be a subset of the worlds where *p* is true: $M_E(Jacob) \subseteq p$. The speaker may believe or even know that what Jacob believes is false, but this is irrelevant for Jacob's beliefs.

(54) $[\![$ Jacob believes that Ariadne loves Paul $]\!]_c = 1$ iff
     $\forall w [w \in M_E(Jacob) \rightarrow w \in \lambda w'.Ariadne loves Paul in w']$

(See also Tancredi 2007 for a very similar formulation.) Since all worlds in the model $M_E(Jacob)$ are *p*-worlds, *believe* is veridical: $[\![$pistevo $(x\ p\ ]\!]_c = 1 \rightarrow [\![\ p\ ]\!]_{MB(x)} = 1$; likewise, other epistemic verbs such as *think,* and *imagine,* and fiction verbs *(dream)*. Factives are *strongly* veridical: the worlds in the speaker's model too are *p*-words, consistent with the observation that factive complements are presupposed to be true (see Giannakidou 1998, 1999 for more discussion).

The directive class, on the other hand, does not require an individual's commitment to the truth of the embedded proposition, and thus express a weaker relation between the speaker and the embedded proposition. Consider *thelo* 'want'. Intuitively, "wanting something is preferring it to certain relevant alternatives, the relevant alternatives being those possibilities that the agent believes will be realized if he does not get what he wants." (Stalnaker 1979: 89; see also Heim 1992). This simply requires that the intersection between $M_E(x)$ and *p* be nonempty:

(55) $[\![$ Jacob wants that Ariadne leave $]\!]_c = 1$ if
     $\exists w [w \in M_E (Jacob) \wedge w \in \lambda w'.Ariadne leave in w']$

X wants p is true in case there is a world in $M_E(x)$ that is also *p*-world. We can thus envision $M_E(x)$ as partitioned into two sets, W_1 and W_2. W_1 is the part that intersects with *p*. W_2, is the part containing non-*p* worlds: therefore $W_2 \cap p = \varnothing$. The worlds in W_1 are more desired alternatives than the worlds in W_2, but from *want (x, p)* we cannot infer that *p* is true in $M_E (x)$. Giannakidou 1998 extends this analysis to modal verbs (which also allow NPIs).

Nonveridicality thus makes the right predictions as to where NPIs may appear and captures the distribution of the broad type of NPI. (Other labels for this NPI have been "affective PI", Giannakidou (1997), nonveridical PI; Giannakidou (1998). Here I adopt the NPI label, following the tradition.) Within the broad NPI class, further, we need to distinguish between the Greek type NPI which is licensed only in nonveridical contexts, and the *any*-like NPIs which exhibit a more liberal distribution and can appear even in veridical contexts under certain conditions. This discussion continues further in section 6.

I will close by summarizing the main tenets of what I call here the nonveridicality theory of polarity, a label that refers to a number of works inspired by the notion (Giannakidou 1997, 1998, 1999, 2001, 2006, 2007, 2009; Giannakidou & Cheng 2006; Giannakidou & Zwarts 1999; Giannakidou & Yoon 2010; Zwarts 1995; Lin 1996 for "non-existence"; a (non)veridicality calculus in a categorial type logic for PI-licensing has been proposed for Italian by Bernardi 2002). The nonveridicality theory represents the most detailed, crosslinguistically oriented program for FCIs and NPIs to date, and its starting point is that PIs across languages and paradigms have varied, but predictable, distributions. The main tenets can be summarized as follows:

(56) **The Nonveridicality theory of Polarity**
    A. *Licensing Property*
    PIs appear in nonveridical contexts. Nonveridical contexts include modal, intensional, generic, downward entailing contexts, disjunctions, and non-assertive contexts (questions, imperatives, and the protasis of conditionals).

    B. *Varied distribution due to lexical composition*
    For each PI paradigm, its lexical semantic properties and its morpho-syntactic features will determine where precisely, within the licensing property space, the PI will appear. Crucially, there are TWO lexical semantic sources for polarity: *scalarity* and *referential deficiency*.
     i. <u>Referentially deficiency</u> covers NPIs that are dependent indefinites (unable to be text-level existentially closed), vague indefinites (indicating uncertainty), two kinds of FCIs (definite or indefinite, both containing a dependent world variable), and the subjunctive mood (which is a non-deictic tense; Giannakidou 2009).
     ii. <u>Scalarity</u> handles NPIs whose meaning includes an EVEN-like component (Giannakidou 2003, 2007; C.-M. Lee 1999; Yoshimura 2007: J.-H. Lee 2010; Yoon 2008).

    C. *Two modes of sanctioning*:
    NPIs can be *licensed* or *rescued*. Licensing happens at the scope of an operator that has the licensing property. Rescuing happens in an otherwise non-licit context due to global semantic-pragmatic reasoning (rescuing accounts for the alleged 'Strawson DE' cases). Rescuing is a secondary option: there are no PIs that are rescued but not licensed.

These three clauses define a flexible framework where various NPI and FCI paradigms can be studied and understood. We examine in this paper the main patterns we

find, starting the class of stricter NPIs — those that are only sensitive to negative and antiveridical contexts.

5. Strict NPIs: NPIs only licensed by antiveridicality

Within the class of of nonveridical functions, antiveridal ones are those entailing the negation of *p*. This category helps make sense of a very common pattern crosslinguistically: NPIs that are licensed very narrowly and appear only with negation and the antiveridical connective *without* (Giannakidou 1997, 1998, 1999). These NPIs are often labelled "strong" or "strict", as opposed the broad NPIs which are thought of as *weak*. Strict NPIs do not appear in nonveridical environments that are not negative.

5.1. Either

Either is known to be an NPI with very narrow distribution (Nathan 1999; Rullman 2003; Giannakidou 2006):

(57) a.   John didn't come either.
     b.   John left without talking to Bill either.
     c.   *Did John come either?
     d.   *I want John to come either.
     e.   * Pick this up either!

There is some variation in the reported data, but all sources agree that *either* is licensed mainly by negative and negative-like expressions.

5.2. Minimizers in Greek, Japanese and Korean

Minimizers in Greek, Japanese and Korean also show very narrow distribution (in contrast to the corresponding class in English, which is very liberal, as we see in section 6). They are only allowed with negation and antiveridical *without*. I give here some of the relevant data (for Greek, see Giannakidou 1998, 1999):

(58) *Dhen dhino dhekara* jia   to ti   th'   apojinis.
     not give.1sg damn   about the what will happen.2sg
     I don't give a damn about what will happen to you!

(59) Kathotan eki *xoris na lei leksi*!
     He just stood there without saying a word.

(60) *Dhinis dhekara ja to ti tha apojino?
     Do you give a dam about what will happen to me?

(61) *An dhinis dhekara, tha me akousis.
     (If you dive a damn, you'll listen).

(62) a. Watasi-wa   gakusei-o   {<u>dare-mo</u> / <u>hito-ri-mo</u>}   mi-nakat-ta.
         I-ᴛᴏᴘ   student-ᴀᴄᴄ   {who-MO / one-ᴄʟ-MO}   see-ɴᴇɢ-ᴘᴀsᴛ
         'I didn't see any students.'

    b. *Gakusei-o   {<u>dare-mo</u> / <u>hito-ri-mo</u>}   mita-ra   siras-ero.
        student-ᴀᴄᴄ   {who-MO / one-ᴄʟ-MO}   see-if   inform-ɪᴍᴘ
        'If you see any student, inform me.'

(For more Japanese data, see Nakanishi 2007; Yoshimura 2007.) Yoshimura (2007) argues that –*mo* lexicalizes as an item with ONE and the wh-indeterminate *dare,* and gets special intonation, in agreement with other strict NPIs crosslinguistically (e.g., Greek minimizers, and n-words; we review these in a minute). In Japanese –*mo* is an additive focus particle that means *also* and in this context *even.* (Japanese also has an unambiguously EVEN item: -*sae;* see Yoshimura 2007 for extensive discussion.)

   Minimizers are also strict NPIs in Korean (J.-H. Lee 2010; C. Lee 1999, 2003), and in this language, a particle meaning exclusively EVEN is used: -*to*.

(63) Ku-nun   pamsay   *hanmati-to*   ha-ci   an-ess-ta.
     he-Top   all night   a word-NPI-even   say-Comp Neg-Pst-Decl
     He didn't say a word all night.

(64) a. *ku-nun   pamsay   hanmati-to   ha-ess-ta.
          he-Top   all night   a word-NPI-even   say-Pst-Decl
          *He said a word all night.

    b. *ku-nun   pamsay   hanmati-to   ha-ess-ni?
         he-Top   all night   a word-NPI-even   say-Pst-Q
         Did he say a word all night?

    c   *ne-ka   hanmati-to   ha-myen, nay-ka ne-lul   cwukyeperi-keyss-ta.
         you-Nom   a word-NPI-even   say-if   I-Nom   you-Acc kill-Fut-Decl
         If you say a word, I'll kill you.

-*To* is itself an NPI-even, used with negation and *without* (unlike –*mo*)—and is also to be found in the Korean n-word (*anwu-to*), producing again a strict NPI (C. Lee 1999, 2003). So, in Korean and Japanese we find NPI-EVEN based NPIs that have this stricter distribution.

5.3. NPI-EVEN

NPI-EVEN is observed, in addition to Korean, in many languages: e.g., Spanish (Herburger 2003), German (*einmal;* Zwarts 1995, and Greek (*oute;* Giannakidou 2007a). I give below examples form Greek:

(65) a. Dhen theli   na dhi   *oute*   to idhio tou to pedi.
         not want3sg   subj see.3sg   even.NPI   the self his the child
         He doesn't want to see even his own child.

    b.   …xoris na theli na dhi to idhio tou to pedhi.
          Without wanting to see even his own child

    c.   *Theli na dhi oute to idhio tou to pedi.
           He wants to see even his own child.

    d.   *Idhe oute to idio tou to pedi?
           Did he see even his own child?

Rooth (1985) claims that there an NPI-*even* in English, and for more extensive recent discussion of the relation between EVEN meanings and polarity see Giannakidou (2007). The connection between strict minimizers and *even* is clear when one looks at languages like Korean, as we saw, and Greek (*oute* can be added to the minimizers).

    Lahiri (1998) pursues an analysis of Hindi NPIs that relies on EVEN but, crucially, his Hindi NPIs exhibit broad distribution, not the narrow one observed typically when a language lexicalizes an NPI-EVEN. Likewise, NPIs that have been claimed to contain *even* in English, i.e., minimizers as we see in section 6, exhibit broader distribution than the strict minimizer NPIs observed here in Greek, Japanese, and Korean. It seems reasonable then to assume that, when it comes to using a lexical item meaning EVEN as the basis for a PI, we must acknowledge at least two different EVENs: one that serves as the basis for strict NPI, and one that produces a broader variety. The former, according to Giannakidou (2007) following Rooth, expresses high likelihood, but the latter low likelihood, and may also be more flexible in the kind of scale it depicts (for this, see also Hoeksema & Rullmann 2001).

5.4. N-words in strict negative concord

N-words (Laka 1990) in strict negative concord languages (Giannakidou 1998, 2000, 2006) can also be thought of as strong NPIs: they cannot appear without negation in the clause:

(66) a. * (Dhen) theli   na dhi KANENAN.   Greek
              not want.3sg   subj. see.1sg n-person
              He doesn't want to see anybody.

     b. *(Non) ho visto nessuno.   Italian (Zanuttini 1991)
         He didn't see anybody.

(67) a. *Idhe KANENAN?
         Did he see anybody?

     b. *Ho visto nessuno?
         Did he see anybody?

The Japanese *dare-mo* and Korean *anwu-to* fall into this category too. The fact that n-words also provide negative fragment answers does not threaten their status as NPIs in strict negative concord, if we assume that fragment answers involve ellipsis of a

negated IP (Giannakidou 1998, 2000, 2006; Merchant 2004). Space prevents me from expanding here; see Giannakidou 2006 and Zeijlstra 2004 for more comprehensive recent discussions.

Importantly, n-words come often with emphatic intonation, as indicated above with upper case. In my earlier work, I took the emphatic NPI paradigm in Greek to be lexically distinct from the non-emphatic NPI—which is deaccented, has much broader distribution — and is still licensed with negation: the version *(Dhen) theli na dhi kanenan* 'It is not the case that she wants to see somebody" is rally a weaker, non-emphatic negation, compared to the emphatic n-word version above (see also Suranyi 2006 for two variants of n-words with negation in Hungarian, and empahtic and non-emphatic negative sentences with NPIs in Chinese, Cheng & Giannakidou 2011). It is important to keep in mind that the stronger NPI classes (including EVEN-containing NPIs) show correlation with emphatic intonation. The broader classes (including any) are not emphatic. So, clearly, negative sentences with NPIs are not always emphatic, it depends on what kind of NPI they contain.

Besides negation, strict NPIs appear also in the scope of negative particles such as *without* and its equivalents, as we saw. *Without p* entails *not p*, hence *without*, just like negation, is antiveridical (Giannakidou 1997, 1998). Crucially, the stricter NPI class is *not* licensed with weak DE quantifiers (*at most n, few N*), since these are not anti-veridical:

(68) a. *To poli pende fitites   dhiavasan   oute ena arthro.
          At most 5 students   read   even one article.

     b. *To poli pende fitites   dhiavasan   KANENA arthro.
          At most 5 students   read   any article.

(For the relevant data in Japanese and Korean see Yoshimura 2007, Yoon 2008.) Besides their severely restricted distribution in antiveridical contexts, strict NPI classes, including n-words, are also distinct from the broader NPIs in that they obey syntactic locality restrictions: their licenser must be usually be a clausemate. This is emphasized in Giannakidou (1998, 2000, and especially 2006), where examples are given with minimizers and n-words from numerous languages including Greek, Slavic, Hungarian, Romance (for the original data see also Progovac 1994; Zannuttini 1991; Przepiorkopski & Kupc 1997; and others); in Giannakidou (2007) it is further shown that NPI-*oute* is also licensed within a clause.

(69) a. * Dhen ipa oti o Janis diavase *oute* tis *Sindaktikes Dhomes*.
          I didn't say that John read even *Syntactic Structures*.

     b.   *O Janis dhen ipe oti idhe KANENAN.
          John didn't say that he say anybody.

     c. *O Janis dhen ipe oti dini dhekara.
          ?John didn't say that he gives a damn.

(70) * John didn't say that Bill came either.

Notice the contrast with the broader NPIs *any* and *kanenas*, which can be licensed long distance even through syntactic islands (see Giannakidou & Quer 1995, 1997 for data on Greek, Spanish, and Catalan, Giannakidou 1998, 2000; Yoshimura 2007 on Japanese):

(71) a. Dhen tou ipan   oti o Bill milise me kanenan.
         They didn't tell him   that Bill talked to anybody.

     b. Dhen prodose mistika pou eksethesan kanenan.   (relative clause)
         He didn't reveal secrets that exposed anybody.

The impossibility of long-distance licensing of strict NPIs, and the fact that it is observed systematically in a number of (often unrelated) languages, suggests that, with this class, licensing is not merely a question of semantic compatibility with a certain context, but rather, perhaps primarily, a question of syntax. The locality has been implemented as QR (Giannakidou 1998, 2000; an idea extended further to Japanese by Shimoyama 2003; Yoshimura 2007; and Hungarian, Suranyi 2006), and in other analysis as a form of agreement (as was originally suggested by Haegeman & Zannuttini 1981 in the *Neg-criterion;* more recent discussions in Progovac 2005; Zeijlstra 2004; Watanabe 2004; Herburger & Mauck 2006; Giannakidou 2007a). In both QR and agreement accounts, the NPI actually moves to a position higher than negation, in violation of c-command, thus allowing for a definition of PI-hood that does not necessarily map into a syntactic scope (see especially Giannakidou 1998, 2000).

To sum up, we have seen in the last two sections that the notion of nonveridicality allows us to unify the polarity environments as a natural class, and predicts that NPIs may appear in contexts that are unrelated to negation or DE as long as they are nonveridical: with modalities, directive propositional attitudes, disjunctions, and questions. Antiveridicality, on the other hand, is the notion we need as a criterion for the stricter NPI classes that are licensed narrowly by more 'negative' licensers. For this class, which is often emphatic, a growing body of literature suggests that we must view licensing also as a syntactic, and not merely a semantic (NPI-EVEN based), relation. Such a conclusion appears to weaken the view that *all* polarity phenomena as purely semantic — and suggests that a more realistic view of polarity is appropriate, where polarity is a landscape of phenomena, some of which may depend on syntax more than others.

6. NPIs in veridical contexts: licensing versus *rescuing*

In this section, we review unexpected occurrences of *any* in veridical contexts, such as sentences with *only,* emotive factive verbs, *hardly, barely*, and *most*. These cases were used by Linebarger as an argument against the attempt to characterize semantically the class of NPI licensers. I start with the NPIs known as minimizers, and which, as we mentioned at the beginning, can be thought of as containing expressions of minimal amount. In Greek, Korean and Japanese, as we just saw, minimizers are strict NPIs, occurring only with antiveridical expressions. In English, on the other hand, minimizers behave more liberally:

(72) a. Ruth didn't *lift a finger* to help me.
     b. Ruth doesn't *give a damn* about what I think.

    c.   Did Ruth *lift a finger* to help?

    d.   If you *you give a damn,* you'll listen.

English minimizers are also fine with directive propositional attitudes, as is shown in the following data, retrieved with Google, 10/17/2006; *gratia* Jason Merchant:

(73) She's still funny and cute and smart and I wish she gave a damn that we aren't friends anymore. I miss Candice. www.xanga.com/betweenIDs

(74) "I just wish you gave a damn about something besides your television set." Mr. Smith threw the remote control across the room stomped out of the room … www. deadmule.com/content/word.of.mule.php?content_id=952

(75) till the pianist finished, we left, and I dropped off tom and went home. Now I wish I had said a word. It would have come out lame though, I just know it. everything2. com/index.pl?node_id=1166781

English minimizers must therefore be thought of as *broad* NPIs, despite the fact that scholars often refer to them as *strong*. The reason why people label them strong NPIs does not have to do with their distribution, obviously, but with the fact that minimizers (in all languages) trigger negative bias in questions (an observation that goes back to Borkin 1971). Negative bias is the expectation (*not* a presuppositionl see Guerzoni 2004; Giannakidou 2007a) of a negative answer to the question containing the minimizer.

(76) Do you give a damn about me?
    Expected answer: No you don't.
    Less expected, though possible answer: In fact, I do!

In more recent accounts, negative bias is either supposed to be triggered by a negative feature on the minimizer (Postal 2003), or is attributed to the presence of a silent or overt *even* (Linebarger 1980; Heim 1984) in English, and crosslinguistically (Giannakidou 2007a). The *even* meaning responsible for bias, crucially, cannot be NPI-EVEN, since NPI-even was shown earlier to be ungrammatical in questions.

    English minimizers and *any* are broad NPIs that have an additional peculiarity when we compare them to the Greek style broad NPI *kanenas:* they can appear in the scope of *only*, and in the complement clauses of emotive factive verbs.

(77) a.   I am glad he said a word!
    b.   I'm glad we got any tickets.   (from Kadmon & Landman 1993)
    c.   Mary regrets that she lifted a finger.
    d.   Only Mary {gives a damn/said anything}.

These data are well known (see Atlas 1993, 1996, and Horn 1996), and pose a puzzle for both DE and nonveridicality, since factives and *only* are veridical and not DE:

(78) Only Bill left   →   Bill left.

(79) Only Larry ate a vegetable   -/→ Only Larry ate broccoli.
     Larry may have eaten spinach.

(80) Larry regrets that I bought a car.   -/→ Larry regrets that I bought a Honda.
     Because, in fact, I bought a Ferrari, and Larry might not regret this at all.

Von Fintel (1999) and Hoeksema (1986) propose weaker versions of DE to deal with
the problem, by allowing the inference to the subset to be part of the common ground.
For instance, if we know in the context that John ate spinach, then from *Only John ate
a vegetable* we can infer that *Only John ate spinach*. By making this move, however, i.e.,
by allowing context knowledge to influence reasoning, weak DE overgenerates (Atlas
1993; Giannakidou 2006); it predicts, for instance, that NPIs may occur also in positive
sentences: if I know that John ate spinach, then upon hearing *John ate a vegetable* I can
infer that *John ate spinach*—yet this will not be sufficient for allowing me to use *any*.
Weakening DE in this way therefore fails to provide a true explanation and predicts a
flexibility of judgement that is not observed (see Atlas 1993 and Giannakidou 2006 for
discussion of more specific problems).

   Greek-style broad and narrow NPIs, we must note, are excluded from *only* and fac-
tives (Giannakidou 1998), and Giannakidou (2006) gives examples illustrating the same
for Spanish minimizer NPIs:

(81) a.   *Xerome pou   {dhinis dhekara/ipes tipota}.
           I am glad   {you give a damn/you said anything}.

     b.   *Mono i Maria   {dhini dhekara/ipe tipota}.
           Only Mary   {gives a damn/said anything}.

     c.   *I Maria metaniose pou kounise to daktilaki tis.
           Only literal interpretation: Mary regrets that she lifted her finger.

(82) a.   *María se arrepintió de haber movido (ni) un dedo.
           Mary regrets that she lifted a finger.

     b.   *María se arrepintió de haber gastado (ni) un duro.
           María regrets having spent a red cent.

Greek and Spanish broad NPIs and minimizers are well behaved NPIs, and are ungram-
matical with *only* and factives, as expected. The absence of DE in *only* and emotive fac-
tives (and some other cases including *long after, hardly, barely*; all impossible in Greek,
at least, Giannakidou 2006), were used by Linebarger as challenges for a semantic expla-
nation for NPI-licensing. However, given the Greek and Spanish facts we see here, we
must admit that this unexpected NPI-sanctioning of *any* and English minimizers is not a
general phenomenon, but specific to the English type of NPI.

   To account for the Linebarger challenge, Giannakidou (2006) suggests that *any* and
minimizers instantiate a class of NPIs that can not only be licensed—in the traditional
sense of being in the scope of nonveridical expression at LF—but also *tolerated* in a

context if that context gives rise globally to a nonveridical inference. In this case, the NPIs are *rescued:*

(83) *Rescuing by nonveridicality*   (Giannakidou 2006)
　　A PI α can be rescued in the scope of a veridical expression β in a sentence S, if (a) **the global context C** of S makes a proposition S' available which contains a nonveridical expression β; and (b) α can be associated with β in S'.

"Association with a nonveridical proposition" means "be in the scope of a nonveridical expression at a level other than LF", however we are to define it, perhaps at the expressive layer (suggested in Yoshimura 2007; Park 2009, building on Potts 2005). The global context C of S is the set of propositions that arise from S without necessarily being *entailed* by it. C thus contains the assertion (entailments), and presuppositions, implicatures. The negative proposition that is responsible for rescuing will be conventionally contributed by some expression in the sentence. In the case of *only*, it is the non-cancelable conjunct *no x other than y P;* with a negative factive, e.g., *regret,* it is the counterfactual *I wish that not p* that is conventionally contributed by it. With *barely* and *hardly* the NPIs are rescued via association with a background negative proposition (whose precise status is still a matter of debate, see Horn 2002), while their veridical or non-DE component becomes, according to Horn (2002), *assertorically inert.*

Rescuing builds on what I called *indirect licensing* in earlier work (Giannakidou 1998, 1999), and happens in violation of scope at LF. Horn (2002) discusses these phenomena in the context of *assertoric inertia,* intended to capture the state of affairs where an NPI appears in the syntactic scope of an expression that does not have the *semantic* potential to license it. The idea, roughly, of assertoric inertia is that when conflicting inferences arise — e.g., as with *only*, the prejacent is veridical but the exclusive inference is nonveridical — one of the inferences becomes assertorically inert, in the case of *only* the veridical prejacent, thus allowing *any* to be licensed. The contrast between the Greek-style NPIs and English-type *any*/minimizers (see Beaver & Clark 2003 for some data from Dutch) shows that we must allow this kind of rescuing/indirect licensing as an option in the grammar, but only as a secondary one: to my knowledge, there are no reports of NPIs that appear to be rescued but not licensed (such NPIs would have to be fine with *only* and emotive factives, for instance, but unacceptable with negation).

Given that the option of rescuing exists, languages may exploit it to a varying degree for the various items. English seems to be more liberal than Greek in this respect. Ideally, one would like to know why a particular type of NPI favors rescuing, or why a given language X exploits the rescuing strategy more liberally than a language Y, but I will leave this to future research. One obvious avenue to explore is that the NPI itself contributes to the rescuing effect, as suggested by Ladusaw's idea of "auto-licensing' in earlier work.

We move on now to the compositionality question.

7.　The scalar approach to polarity

In the following two sections, we address the question of compositionality: why do PIs appear the contexts they appear in? What is it about negative and nonveridical environments that makes them appropriate environments for NPIs? Why are some NPIs more

narrow, and some more broad? Addressing these questions is extremely important, as I said at the beginning, because in answering them we gain a better understanding of what NPIs mean, and how — and to what extent — their meaning restricts their distribution.

There have been two approaches to compositionality. The first claims that there is only one source of ill-formedness in polarity — *scalarity*, which in some form or other, is supposed as the culprit of *all* polarity phenomena (Kadmon & Landman 1993; Krifka 1995; Chierchia 2006; Lee & Horn 1994; Lahiri 1998). This position has been very influential, so we need to assess very carefully what it says and how far it can go. The second approach within the nonveridicality theory of polarity that we mentioned earlier (Giannakidou 1998, 2001, 2006, 2007) is a variation position. It claims that there are *two* main sources of lexical sensitivity: (a) scalarity, which in most cases contains some sort of morphological marking via e.g., a focus particle such as EVEN (Giannakidou 2007a); and (b) referential deficiency, i.e., a difficulty in the NPI to refer to an object in the usual ways existential quantifiers do (Giannakidou 1998). Referentially deficient NPIs are in fact quite common, and referential deficiency comes in many forms, e.g., non-deictic (or dependent reference, as we will see below), free choice, referential vagueness (Giannakidou & Quer 2010).

In what follows, I address the scalarity approach. In the next section we examine the referential deficiency approach.

7.1.   Domain widening

Kadmon & Landman's (1993) influential paper on *any* proposed a unified theory for NPI and FCI *any* by appealing to the notion of domain widening:

(84) Meaning of *any* (Kadmon & Landman 1993)
    any CN = the corresponding indefinite NP or CN with the additional semantic/pragmatic characteristics (widening, strengthening) contributed by *any*.

(85) *Widening* of *any* (Kadmon & Landman 1993)
    In an NP of the form *any CN, any* widens the interpretation of the common noun phrase along some contextual dimension.

Domain widening says that the use of *any* widens the quantificational domain. *Any* is thus unlike other quantifiers—whose domain must be typically narrowed down. Widening is felicitous only if it produces *strengthening*:

(86) Licensing condition for *any*: Strengthening
    Any is licensed only if the widening that it induces creates a stronger statement, i.e., only if the statement on the wide interpretation entails the statement on the narrow interpretation.

The idea is that widening must have a purpose, and this to make a stronger statement (see also Krifka 1995). So, the driving idea is that statements with *any* are always strong, emphatic—recall however, that NPIs as a class are *not* strong in the sense of emphatic. Greek broad NPIs, and similar NPIs crosslinguistically typically produce weak statements — as opposed to their emphatic variants that are indeed emphatic but

have much narrower distribution. And, apart from the Greek type, it is helpful to note Israel's (1998) *attenuating* NPIs ("long", "much", "yet", "in weeks") which do not yield a stronger negative assertion, but a weakened one.

Strengthening is said to be satisfied in a negative context, but not in a positive one:

(87) a.   I didn't see any book on the table.
     b.   *I saw any book on the table.

The positive sentence is out because, in Chierchia's words, "domain widening is pointless" (Chierchia 2006: 557) in a positive sentence. If it is true that I saw a book in the narrower domain, it is also true that that I saw one in the wider domain, thus the widened statement is too weak, and for this reason not very informative. Strengthening, however, is satisfied with negation and DE quantifiers. Here lies the essence of all widening/scalarity based accounts.

Chierchia (2006) further pursues a unitary analysis for FCI and NPI *any* via domain widening — implemented in a system where implicatures project in a syntactic-like manner. Chierchia excludes *any* in the positive sentence in the following way. First, the NPI introduces alternative smaller domains, indicated by the index *i*, which refers to numbers between 1 and the maximum number (in this arbitrary case *three*) that we take our largest domain to consist of:

(88) a.   *I saw any boy.   (Chierchia's (47))
     b.   Meaning
          $\exists w' \exists x \in D_{w'} [\text{boy}_{w'}(x) \wedge \text{saw}_w (I, x)]$ $D = \{a, b, c\}$

     c.   Alternatives
          $\exists w' \exists x \in D_{w'} [\text{boy}_{i,w'}(x) \wedge \text{saw}_w (I, x)]$, where $1 \leq i \leq 3$

In a domain that consists of three boys, *any boy* quantifies over domains that contain one boy, two boys, and all three boys. These alternatives are active with a word like *any,* and must be used to enrich plain meaning, according to Chierchia. The domain of individuals is not ordered, but in choosing among alternatives, speakers tend to go for the strongest one they have evidence for. In the case above, we end up saying that even the most broad choice of D makes the sentence true: "in other words, the base meaning will acquire an *even*-like flavor" (Chierchia 2006: 556).

The positive sentence also gives rise to the following implicature (Chierchia's (48)):

(48) Implicature
     $\exists w' \exists x \in D_{w'} [\text{boy}_{w'}(x) \wedge \text{saw}_w (I, x)] \subseteq_c$
     $\exists w' \exists x \in D_{w'} [\text{boy}_{i,w'}(x) \wedge \text{saw}_w (I, x)]$, where $1 \leq i \leq 3$, and
     $p \subseteq_c q$ means: p is stronger (hence, less likely) than q relative to the common ground c

Chierchia claims that "given the way domains are chosen, (48) is logically false: all of the alternatives are logically stronger than the statement in *b*; therefore, the latter statement cannot be less likely than its alternatives. The positive sentence enriched by implicature (48) is inconsistent, whence its deviance." (Chierchia 2006: 556).

7.2. Problems with domain widening

Here I will take widening theories to task and see how far they can go in explaining (at least some of) the core facts we saw in this chapter, and how successful they are in being compositional, in the sense that they derive the restricted distribution by meaning alone.

In all widening approaches (Kadmon & Landman, Krifka, Chierchia), the failure of *any* in a positive veridical sentence follows from informational strength. Sentences with unlicensed *any* are claimed to be impossible because the use of *any* renders them too weak to be informative (Kadmon & Landman, Krifka), or inconsistent (Chierchia) after implicature enrichment. The first, rather obvious, problem lies precisely here: the ill-formedness that such a type of explanation predicts is weak (Giannakidou 1998, 2001): sentences with failed *any* must have the same psychological status as uninformative or contradictory sentences. But this is not true. Speakers generally perceive, with failed NPIs, an effect stronger than mere infelicity, which is what characterizes uninformative sentences — contradictions, tautologies (*The morning star is the morning star*), presupposition failures (*The king of France is my brother*), lexical anomalies (*The green ideas sleep furiously*) are never judged ungrammatical. The grammar generates them, and speakers have an intuition that they can produce them; they can even figure out ways to render them felicitous in certain contexts. Pragmatically odd sentences as thus perhaps non-sensical without context, but certainly repairable and grammatically possible.

Deciding that polarity ill-formedness is psychologically equivalent to mere "logical failure" (to borrow the term from Chierchia) is not a trivial question. Certainly, Ladusaw did not think they were equivalent, and Giannakidou made repeatedly the same point in discussions about various kinds of NPIs. Both Ladusaw (especially Ladusaw 1983) and Giannakidou view NPIs as a case for semantic well-formedness being a *grammatical* constraint, not merely a pragmatic one. And since Chomsky (1957, 1964), the field has generally (and I think correctly) accepted that speakers' reactions to, and intuitions about, "odd" and "ungrammatical" sentences differ. Thus, unless we have an independent (e.g., *psychological*) metric that *shows* that NPIs failures and contradictions or uninformative sentences are the same, the scalarity approach simply predicts too weak a result.

Giannakidou (2007a) further shows that in the EVEN-NPI domain in Greek, there are NPIs that are ungrammatical (NPI-EVEN), and NPIs that are indeed only merely odd. For negative concord phenomena — where n-words are subject to much stricter licensing conditions and for which speakers have an even clearer intuition that the NPIs (n-words) are not simply odd but ungrammatical — it is unavoidable to posit further syntactic constraints. So, the informativity based scalar accounts can only go a small distance, but have gained prominence because a lot of the variation and distribution nuances is usually "abstracted away" in the descriptions.

Chierchia does acknowledge the insufficiency of the purely pragmatic account as the following passage shows: "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). And later on, he posits a lexical entry for *any* (his (51)) where, in addition to widening, *any* is claimed to have an uninterpretable feature $[+\sigma]$ (Chierchia 2006: 559), ensuring that *any* will be in the scope of some operator. It is checking of this feature that renders *any* grammatical, and this is a clear withdrawal from the purely pragmatic position.

One could still view the pragmatic principle of widening as *motivating* the grammatical constraint (perhaps historically, perhaps synchronically). (Thanks to Paul Portner for the suggestion.) Widening and strengthening may not be the explanation for NPI ungrammaticality, but rather a description of how the grammatical constrained emerged. (In the literature on the definiteness effect similar reasoning has sometimes been pursued.) However, the research in the widening account is not satisfied with such modest goal. Their goal, as clearly stated in Kadmon & Landman, Krifka, and Chierchia, is a more ambitious one: to explain the distribution of *any* directly, and only, via widening and strengthening. Chierchia's [+σ] feature, then, is a withdrawal from this purely pragmatic position, since widening alone cannot rule out correctly NPIs in positive episodic sentences (Giannakidou 2001).

Another problem lies with the very claim that *any* induces widening: widening is not always present with *any*, NPIs or FCIs (as noted in Krifka 1995, who actually accepts an emphatic and a non-emphatic variant of *any,* and more recently Duffley & Larivée 2010). Consider the examples below:

(89) Pick any one of *these 5 cards*.

(90) Consider any arbitrary number.

Here *any* extends over a very specific domain of the five cards in the context supplied by the partitive. We cannot talk about domain widening in this case. Likewise, the set of numbers is infinite, so it is hard to see what domain extension would yield in *any arbitrary number.*

Duffley and Larivée point out as problematic for widening the case of questions:

(91) Did you hear any noise?

"Contrary to questions with end-point scalars, such sentences usually do have the force of neutral information-seeking questions. Since information questions do not normally bear on scalar end-points, a scalar analysis of *any* is highly problematic in this environment." (Duffley & Larivée 210: 6). And they continue: "Besides the interrogative above, the scalar paraphrase by means of 'even the least/even a single' also encounters difficulties in its application to other common uses of *any* in standard polarity contexts. Three such cases are given below:

(15) If you find any typos in this text, please let us know.

(16) You can pull out of the driveway. I don't see any cars coming.

(17) We checked the wiring before we made any changes to the electrical box."
                                                                      (Duffley & Larivée 2010: 7)

In these contexts, *any* is interpreted indeed very weakly, unlike scalar, EVEN containing items which typically give rise to stronger statements. It should be thus clear that widening is not empirically motivated always, not even for *any,* the item for which it was designed.

Another problem, when one considers the generality of the widening approach — and recall that the approach has indeed been conceived of as a general theory of NPIs — has to do with the fact that not all NPIs are scalar. *Kanenas*, as mentioned earlier, is not:

(92) Fere kanena gliko.
    Bring some cake.
    (Context: No need for something specific; it doesn't matter what you bring really).

Kanena is a non-scalar existential, and statements with it are typically weak and nonemphatic. The *kanenas*-type of NPI seems to require not a wide domain, but some variation in the domain because it is referntially vague — as Giannakidou & Quer 2010 suggest. Such NPIs are non-scalar, but are still unacceptable in the veridical positive sentence, just like the scalar ones. For these NPIs, which are in fact more common than we think, domain widening is simply not a plausible starting point.

Now, even when it comes to scalar items, recall that not all widened PIs improve with negation: *any* improves, but FCIs, in many languages (Greek, Spanish, Catalan, Romanian, Chinese), remain unacceptable with negation:

(93) a.   *Idha   opjondhipote.   (Greek; Giannakidou 2001)
        saw.perf.1sg FC-person
        '*I saw anybody.'

     b.   *Dhen idha   opjondhipote.
         not   saw.perf.1sg   FC-person
         Intended: 'I didn't see anybody.'

The problem posed by these data is twofold. First, the non-improvement of FCIs with negation undermines the idea that NPI and FCI are due to the same source (*pace* Chierchia 2006). Clearly, this cannot be the case, or at least it cannot *generally* be the case. Second, the informativity based account predicts improvement with negation for *all* widened items; there is no way to distinguish between the scalar NPI and the scalar FCI. The ill-formedness of FCI *opjondhipote* suggests, again, that there is something other than widening that further reduces the distribution of FCIs. Giannakidou (2001) argues that this additional dimension in FCIs is intensionality, and regardless of whether one accepts this analysis, it is simply not true that all scalar items improve with negation.

The asymmetry within the class of NPIs and FCIs in terms of polarity poses an equally challenging problem. Take *any* and *whoever* as the contrastive pair here. Both involve domain widening (Jacobson 1995; Horn 2002; Giannakidou & Cheng 2006), but only *any* is polarity sensitive:

(94) a.   Whoever saw a fly in his soup complained to the manager.
     b.   Irgendein hat angerufen.
     c. *Anyone complained to the manager.

Likewise, *irgendein* in German patterns with *whoever* and not with *any*, despite its domain widening (Kratzer & Shimoyama 2002). This variation leads to a conclusion similar to the one we just reached regarding the variation with negation: there must be

something other than widening that further reduces the distribution of some scalar items, but not others.

The final puzzle for domain widening is posed by the fact that items like *any*, as we saw earlier, are admitted in a large set of contexts not related to negation and DE: modal verbs, imperatives, questions, nonveridical propositional attitudes, generic and habitual sentences. It is not obvious how widening and strength invoked by Kadmon & Landman, Krifka and Chierchia can be extended to explain why *any* is licit in these contexts. Consider, for example, the generic and habitual case:

(95) a. Any cat hunts mice.
　　 b. Opjadhipote ghata kinigai pondikia.

(I am not using the *kanenas* paradigm here since it does not involve widening). Here *any cat, which* is an NPI/FCI and gets widened interpretation, does *not* entail the more narrow one, since there are exceptions to generic generalizations (Krifka et al. 1995). Hence *any* should be unacceptable in this context. But it is not; rather, genericity is a very common context for widened items.

Consider also NPIs in questions. I noted earlier that there is no successful analysis of questions as DE, and in the informativity based theories that we are discussing this fact has been recognized (see especially van Rooy 2003). The strategy is to assume that NPIs are allowed in (non-rhetorical) questions either because they make the question more *general* than the corresponding one without the NPI (Krifka), or because a question turns a settled issue into an unsettled one (Kadmon & Landman). But why should a general question be preferred to a more specific one, as these theorists pose? And how, and why, should this notion of generality be seen as a special case of strength in questions?

Van Rooy (2003) proposes that strength in questions must be reduced to *entropy*. Entropy is the measure of the informativity value of a question. The informative value of question Q is maximal just in case the answers to Q are all equally likely to be true. The value becomes less than maximal when an NPI occurs (resulting in biased readings). In van Rooy's words: "The NPI weakens the satisfaction conditions for the positive answer, q, and strengthens the satisfaction conditions for the negative answer ¬q." (van Rooy 2003: 263). It is further proposed that entropy can replace strength also in assertions, so it allegedly provides the unifying notion of strength.

This type of explanation should make us pause. First of all, the use of an NPI in questions generally does *not* yield bias in polar questions — only the use of a certain type of NPIs does, and is due to a particular kind of EVEN that it contains (Giannakidou 2007a*)*. Secondly, the entropy and strength explanation is analytically too weak: as mentioned already, less informative sentences do not become less grammatical. Van Rooy takes it for granted that informativity impacts grammaticality directly, and as we saw with widening, this is not a sound assumption—or at least, should be one argued for, not just taken for granted.

The purely pragmatic route thus produces liberal theories that predict more fluid judgment than we have with NPIs. Even *any*, an NPI of the more liberal kind as we noted, cannot occur just as freely as van Rooy's reasoning predicts. In fact, in questions, free choice *any*, and FCIs generally, are systematically out. The diagnostic is the ability to modify *any* by *almost* (only FCI-*any* accepts this modification, Davison 1981):

(96) a.   *Did you see almost anybody?
      b.   *Idhes sxedhon opjondhipote?   (Greek)

FCIs are prototypical scalar items, but they fail to be licensed in questions (see also Quer 1998 for Spanish, Catalan data). This robust empirical fact is a surprise for van Rooy's unifying negation and questions account, and remains a surprise for all strengthening theories: FCIs, involving domain widening, are *not* admitted van an Rooy's unified environments of strength: negation and questions; and non-scalar weak NPIs, on the other hand, like *kanenas, do* appear in negation and questions. This suggests (a) that widening does not necessarily correlate with strength, and (b) that widening and strengthening (in whatever version) do not predict the right kind of polarity sensitivity, a dooming conclusion in both cases. It must be admitted that we still need other factors (syntactic or semantic) besides pure informativity for accurately restricting NPI and FCI distribution, and distinguish correctly between the two.

Finally, regarding other nonveridical NPI environments, it is unclear how informativity as entropy would apply, e.g., in directive, but not epistemic, propositional attitudes. I know of no research that has actually defined strength in this domain, and this is probably because if we want to have strength for these cases, the notion itself becomes too weak to be useful.

To summarize, then, we saw in this section that a purely pragmatic theory of domain widening, by appealing exclusively to scalarity and conversational principles such as informativity and strength, does not predict the correct distribution of various kinds of NPIs or FCIs; nor does it predict the correct effect of illicit NPIs. Domain widening also misses the fact scalar and non-scalar NPIs are equally sensitive to negation, questions, and other nonveridical environments, and is unable to account for variation with respect to negation (negation does *not* save all widened items: FCIs remain bad), or within widened items as regards their polarity status or not (some FCIs are polarity sensitive, and some others aren't). In the end, it becomes obvious that even though widening may indeed be a lexical property of some NPIs (though recall the difficulties with *any*), when it comes to working out the details of the explanation, it becomes impossible to make the argument that it is widening alone that restricts the distribution of these NPIs. Chierchia admits this point by adding a syntactic feature [+σ] to *any*. But by doing that, the purely pragmatic argument loses its appeal, and NPIs can no longer be offered as a case illustrating a direct impact of pragmatic principles on sentence grammar. This conclusion carries over to Lahiri's (1998) account based on the overt presence of EVEN in Hindi broad NPIs, and I will refer here to Giannakidou (2007a) for detailed consideration and counterarguments.

8. The other side of polarity: non-deictic variables and referential deficiency

As we noted already, one of the empirical limitations of the scalarity approaches is that they tend to lump together all polarity phenomena as scalar, thus assigning priviledged status to scalarity as the basis for explanation. Non-scalar NPI indefinites of the *kanenas* type, were noted early in Haspelmath, Giannakidou, Lin, and Matthewson's work, but research tended to place these in the margins, despite the fact that they are common

crosslinguistically. In this section we focus on these NPIs, and show that they instantiate a very important aspect of negative polarity that has to do with what I call broadly *referential deficiency*.

By 'referential deficiency', I mean to refer to obligatorily narrow scope phenomena that have been known to semanticists for many years—e.g., incorporated nominals in Greenlandic Eskimo (Bittner 1987; van Geenhoven 1998), accusative-partitive alternation in Finnish (Kiparsky 1998) and related phenomena in Turkish (Enç 1991; de Hoop 1992), the genitive of negation in Russian (Partee 2008; Borschev et al. 2008), English bare plurals always taking scope inside negation (Carlson 1977), narrow scope indefinites that must be bound by higher quantifiers (*egy-egy* indefinites in Hungarian, Farkas 1998, and similar items in Russian, Basque, and other languages; Pereltsvaig 2008). Almost all analyses of obligatorily narrow scope expressions assume a notion of 'low ', or decreased (to use Partee's 2008 word) referentiality to capture narrow scope — as opposed to 'higher' referentiality, or specificity, that characterizes indefinites that tend to take wide scope (i.e., indefinites with specificity markers, or accusative marked indefinites in Finish and Turkish, as observed in the accusative-partitive alternation). Scales of referentiality have also been proposed (Anagnostopoulou & Giannakidou 1995), and referentially low expressions occupy the bottom end of those scales.

The referential deficiency approach says that NPIs of this kind cannot refer in the normal way. In Giannakidou (1998: 70–71, 139–140) I suggested that the *kanenas* type of NPI must be seen referentially deficient, thus obligatorily narrow scope indefinites. By making this move, we capture the 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 non-veridical ones. In this context, no special status is given to licensing per se, and I used the label 'dependent' existential to capture the *kanenas* NPI:

(97) An existential quantifier $\exists x_d$ is dependent iff the variable x_d it contributes does not introduce a discourse referent in the main context. (based on: Giannakidou 1998: 70)

A dependent existential in this sense is an existential that cannot assert existence in a default context. This is formalized by using a designated variable: "x_d" (in Giannakidou 1998 originally "x_{ni}" 'for 'no introduction'). In the indefinite theory of existentials, we would have to say that dependent indefinites contain variables that cannot be closed under Heim's (1982) *text level* existential closure (Giannakidou 1997, 1998); i.e., they cannot receive values from the context. Such variables will not be able to be used in unembedded veridical sentences because they cannot receive a value. Under negation, happily, they will not be forced to refer, and likewise in embedded contexts (see Giannakidou 1998: Ch. 3 for details).

(98) ⟦ kanenas ⟧ = **person** (x_d)

(99) a. *Idha   kanenan.
          saw.1sg   anybody

     b. Dhen idha kanenan.
         not saw.1sg anybody

(100)   a.   # $\exists x_d$ **person** $(x_d) \wedge$ **saw** (I, x_d)
        b. $\neg \exists x_d$ [**person** $(x_d) \wedge$ **saw** (I, x_d)

Under negation, $\exists$-closure of x_d will be fine because x_d will not introduce a discourse referent. Generally, then, dependent variables of this kind will be fine in the scope of nonveridical operators, because these ensure that x_d will not be forced to introduce, or be associate with, a discourse referent in the main context. Den Dikken & Giannakidou (2002) analyze further *any,* and *wh-the-hell* phrases as NPIs of this kind.

The intuition that some quantifiers cannot assert existence is also found in Matthewson's (1998) claim that the NPI *ku…a* and *kwel…a* determiners in St'at'imcet Salish "represent the notion of 'non-assertion of existence'" (Matthewson 1998: 179). (The Salish determiners appear to be a bit broader in their distribution than the Greek *kanenas*—but it is important to note the parallel). Matthewson further argues that such determiners do not entail non-existence of an entity, rather they "merely fail to positively assert the existence of an entity" (Matthewson 1998: 179). Giannakidou (1998) likewise notes that dependent reference does not imply lack of reference:

(101)   An dhis kanenan₁,   pes tu₁   na me perimeni.
        If you see anybody,   tell him   to wait for me.

Here *kanenan* does introduce a discourse referent, which is subsequently modally subordinated to the pronoun *tu.* Yet the introduction of the referent is done not in the main context but in an embedded one (the protasis of the conditional). Dependent existentials thus receive values only in embedded domains; their 'deficiency' is that the assignment function *g* cannot give them a value in a main context. In other words, dependent indefinites of the *kanenas* type cannot be interpreted *deictically*. As a technical aside here, we assume that multiple domains are available in a sentence when there is embedding (Giannakidou 1998; Tancredi 2007a, 2007b), just like there are multiple models; recall our discussion of propositional attitudes. In fact, we can define (following Tancredi) a conversion function that would assign a distinct domain to each model. We can then rephrase the dependency of the *kanenas* indefinite as a claim that it cannot receive a value in the main domain.

The dependent reference that yields polarity sensitive expressions, then, applies to variables that cannot be interpreted in the context as free variables. It will thus be helpful to think of the NPI-variables as 'non-deictic' variables — as suggested to me by Barbara Partee — instead of merely 'dependent' ones — since the term 'dependent' has also been used, e.g., by Farkas (1998), to refer to variables that simply need to co-vary with a quantifier, and which do not yield NPIs. Farkas's choice of "dependent" seems to be a misnomer, however. The so-called dependent indefinites that she studied seem to be distributive object NPs, that are, crucially, reduplicated, e.g., *egy-egy* in Hungarian. Reduplication is a hallmark property of distributive NPs in many languages, Greek included (Giannakidou 2011). In the case of distributive NPs, it should clear that we are not talking about referential dependency in the sense of not being able to introduce a discourse referent; rather we are dealing with a different kind of co-variation constraint that characterizes lexically distributitive QPs.

I define the notion of non-deictic variable below:

(102)   *Non-deictic variables*
        An variable *x* is non-deictic iff *x* cannot be interpreted as a free variable.

A non-deictic variable is thus one whose assignment function is constrained in this particular way — and perhaps an easy way to think of this is as a presupposition on the assignment function *g*, e.g., on a par with constraints on *g* that we have with definites, or anaphoric pronouns.

In Giannakidou (1998, 2001), the non-deictic variable analysis is extended to FCIs which are argued to contain a non-deictic *world* variable w_d. This variable cannot become licit just by being existentially closed in the scope of some operator (after all, there *is* no text-level existential closure of a world variable). Rather it can only become licit via binding by a Q-operator that can bind a world variable. In an episodic context (positive *and* negative) there is no such operator, the variable remains unbound, and the FCI becomes illicit. We can thus explain the empirical contrast between FCIs and NPI vis a vis negation, and why FCIs need adverbial quantification contexts: they contain a dependent variable of type *s* which, because of its nature, needs to be bound, and can't be simply existentially closed in the scope of a nonverdical operator.

A non-deictic variable will create a lexical item that will be a good candidate for becoming an NPI of the broad variety — though from this it does not necessarily follow that all NPIs that contain non-deictic variables will *synchronically* show the same distribution. The path from being a non-deictic variable to being grammaticalized as an NPI may be longer or shorter for various items across languages, and other factors in grammar and, especially, use are expected to play a role. For example, Romanian *vreun* is a non-deictic NPI that appears in nonveridical contexts, but still not in directive propositional attitudes or direct scope of negation (Farkas 2002, Falaus 2009). Given the broad array of nonveridical contexts, grammaticalization can start from any one of these environments — and spread gradually across. It does not follow from the nature of non-deictic reference that negation or propositional attitudes must be the priviledged starting points. Licit contexts can spread overtime — and they can also shrink (as Hoeksema 2010 shows this to be the case for Dutch *enig*). Becoming an NPI is a fluid process — and the deictic variable idea must be understood primarily as a possible lexical source for NPIs pointing to particular distribution (nonveridical contexts), not as a predictor that *all* non-deictic variable NPIs will have synchronically identical distributions.

Another important thing to consider is that the NPI that contains a non-deictic variable, like *any*, may also contain other lexical properties that will place additional factors in determining its distribution. This is where scalarity may become relevant. If you are a non-deictic indefinite *and* have, e.g., a scalar implicature, you are bound to show distribution similar to that of *any*. There may also be tension between the two lexical properties — referential deficiency and scalarity — that may result in dominance, over different stages in time, of one property (and thus distribution) over the other. Viewing lexical sensitivity flexibly indeed affords a unitary analysis of *any* and for the apparent NPI-FCI variety of item generally — a welcome result. It can also explain why there are nonveridical contexts where this type of NPI does not appear — e.g., disjunctions, or why *any* may favor negation more than *kanenas*.

Space prevents me from elaborating more in this paper, but it is important to emphasize that NPI-lexicalization must be viewed as a dynamic process, not a static one, and diachronic work will be instrumental in helping us understand the basic tenets and shifts across language and NPI types. It is also quite plausible that we discover, for instance, that there are NPIs that favor negation and modal contexts only, or just modal contexts, or just intensional contexts, or just questions. These sensitivities to subsets of the nonveridical are all to be expected, and the task will then be to determine what further lexical properties are out there in the world's languages that can possibly narrow down the distribution of NPIs.

9. Positive polarity items

Positive polarity items (PPIs) are thought to have "the boring property that they cannot scope below negation" (Szabolcsi 2004: 409). In this section, we consider two representative members of the class — the indefinite *some* PPIs*,* and speaker oriented adverbs (Nilsen 2003; Ernst 2009). As with NPIs, we see that at least one instance of PPIs (*some*) concerns the referntiality properties of expressions — and another (speaker oriented adverbs) has to do with speaker commitment to the truth of a proposition. In both cases, PPIs will need to be situated in a veridical context — because in nonveridical contexts and negation neither referentiality nor truth commitment are satisfied. Crucially, as Szabolcsi and Ernst both emphasize, scalarity is not a factor in PPIs: PPIs some and speaker oriented adverbs are non-scalar.

We will also uncover a particular intonational pattern for *some*, from which only stressed SOME emerges as a PPI. Unstressed *some*, crucially, is just a non-PI indefinite, as we shall see. The accenting that we find signals scoping above negation, a pattern agreeing with what we find with some NPIs that need to be raised above negation in other languages as we mentioned in section 5. Importantly, as I said, the study of the PPIs discussed here shows that scalarity plays no role in PPI distribution.

9.1. Two kinds of *some* indefinites: emphatic and non-emphatic *some*

Ever since Jespersen, *some* has been thought of as a PPI in that it must scope above negation:

(103)   You didn't see something.

This sentence cannot mean that you *didn't see anything*, where an existential quantifier scopes below negation. Scoping above negation is the defining property of a PPI, and it is indeed observed with equivalent items across many languages, e.g., Serbocroatian (Progovac 1994, 2005), Dutch (van der Wouden 1994), Greek (Giannakidou 1997, 1998), Hungarian (Szabolsci 2004), among others. It has gone unnoticed, however, that this scoping has a particular intonation: *some* is accented (uppercase henceforth), and negation is de-accented:

(104)   You didn't see SOMETHING.

The reverse pattern, when *some* is de-accented, allows, and perhaps even favors, a narrow scope reading under negation. In this case, negation is accented (*emphatic denial*). PPIs

like *some* are thought to be "allergic" to negation, and this allergy was formulated as *anti-licensing* by negation (Progovac, Giannakidou, Ladusaw) in the sense that *some* must raise structurally in a position above negation (plausibly via QR). PPIs in this context are the reverse of NPIs, and scholars thought of them as contrasting pairs; van der Wouden (1994) further identifies a class of so-called *bipolar* items: these are claimed to require a decreasing licensor (an NPI-property) but cannot occur under a local antimorphic item (a PPI-property). Van der Wouden argues that NPI-hood and PPI-hood are two primitive properties and may therefore coexist in one item, but it is hard to assess this claim empirically first because this alleged category is very rare, and second, because the NPI and PPI "features" are not lexically but only distributionally defined.

Apart from clausemate negation, *some* is excluded also from the immediate scope of a negative quantifier, and *without*:

(105)   a.   John didn' t call SOMEONE.   # not > some
        b.   Nobody called SOMEONE.   # no one > some
        c.   John came to the party without SOMEONE.   # without > some

So we can generalize that emphatic SOME must scope above antiveridical elements. However, *some*-PPIs have been notorious for scoping *below* non-local negation (Progovac 1994; Szabolcsi 2004):

(106)   Bill didn't say that you saw something.   not > say> some

This narrow scoping wrt negation is peculiar for items that must escape the scope of negation in the first place. To make things worse, narrow scoping of *some* is observed even with local negation, if *negation + some* is found under an NPI-trigger — a fact noted in Jespersen, Baker and Postal, and emphasized by Szabolsci. I give below data from Szabolsci (2004: (33)–(40)):

(33) I don't think that John *didn't call someone*.   √ not > not > some

(34) No one thinks that John *didn't call someone*.   √ no one > not > some

(35) I am surprised that John *didn't call someone*.   √ surprise > not > some

(36) I regret that John *didn't call someone*.   √ regret > not > some

(37) If we *don't call someone*, we are doomed.   √ if (not > some)

(38) Every boy who *didn't call someone* …   √ every (not > some)

(39) Only John *didn't call someone*.   √ only > not > some

(40) Few boys didn't call someone.   √ few > not > some

Why would a PPI under negation become legitimate in NPI contexts? Szabolsci suggests that this is so because PPI plus negation is an NPI itself. PPIs are claimed to "have two NPI-features. One is a strong-NPI feature like that of *yet* and *squat*: it requires a

clausemate antiadditive licensor, according to Szabolcsi, without intervention. The other is a weak-NPI feature like that of *ever*: it requires a Strawson-decreasing licensor (not necessarily clausemate but without intervention). I propose that these two features are normally 'dormant'. A context that can license the strong-NPI feature 'activates' and, in the same breath, licenses that feature. What we have seen indicates, however, that the other, weak-NPI feature also gets activated at the same time — activated, but not licensed. Therefore, the emergent constellation is illegitimate, unless a licensor for the weak-NPI feature is provided. In other words, PPIs do not detest antiadditives; they have a latent craving for antiadditives. That they appear to detest them is due to the fact that the satisfaction of this craving activates another, which needs to be satisfied independently." (Szabolcsi 2004: 429).

In such an account, a negative condition (anti-licensing) is reduced to a positive one (licensing), and an underlying NPI source is posited in both NPIs and PPIs. The exact nature of the commonality needs to be refined, but the appeal of the reasoning here cannot go unnoticed. However, there are reasons to be cautious. One obvious short-coming is that this account envisions NPI and PPI licensing in terms of syntactic features purely — negations, in particular — and gives us little insight into the lexical semantics of *some* itself.

Szabolcsi is correct to point out that *some* is not scalar, or strictly referential: clearly, in the cases above it takes narrow scope. However, Szabolcsi treats *some* as ¬¬∃, with the two negations canceling each other out, and it is difficult to see this as more than mere stipulation. What is the evidence for the two negations? And why do we never see overt realizations of them in *some* crosslinguistically? This is typologically quite surprising, because negation in languages is never "forgotten" to be marked, if there (Horn 1989). Ultimately, would a language bother to implement two negations on an expression just in order to cancel them out?

In assessing Szabolci's data, it is important to note two things. First, the narrow scope *some* we just observed is non-emphatic; reproducing the examples with emphatic SOME is odd:

(107)   a.   # I don't think that John didn't call SOMEONE.
        b.   # No one thinks that John didn't call SOMEONE.
        c.   # I am surprised that John didn't call SOMEONE.
        d.   # Every boy who didn't call SOMEONE …
        e.   # Only John didn't call SOMEONE.
        f.   # Few boys didn't call SOMEONE.

The judgments here are from a total of five native speakers, and obviously a more large scale inquiry is needed to establish the conditions on the availability of the two intona-tional patters for *some*. Two things are important here: first, the narrow scope correlates with non-emphatic intonation, and second, nonemphatic intonation is *not* the intonation observed with clausemate negation. Based on this contrast, it becomes plausible to argue that the narrow scope *some* is a different species from the PPI emphatic *SOME* under negation. Intonation has been shown to distinguish NPI paradigms in various langages (Greek, Japanese, Korean, just to mention some of the cases we saw earlier) — and it can be understood as a morphological feature. The emphatic member of the pair is the one that outscopes negation, just like, e.g., the emphatic member of kanenas/KANENAS

outscopes negation in the analysis of Giannakidou (1998, 2000). Emphatic SOME, then, becomes part of this general interaction between negation, scope and polarity items.

Notice that SOME is also odd when negation is long distance:

(108)   a.   *John didn't {say/claim/know} that Bill talked to SOMEONE.
        b.   Noone {said/claimed/knew} that Bill talked to SOMEONE.

If SOME has to undergo QR to adjoin to the main IP to get scope higher than negation and *noone,* then the impossibility of SOME can be explained, since QR is not allowed through a tensed clause. Likewise, emphatic NPIs that undergo QR were shown to not be licensed long distance for exactly the same reason (see Giannakidou 1998, 2000 for discussion).

Secondly, to go back to Szabolcsi's observation, lower negation is in fact *not* necessary for narrow scope non-emphatic *some*: this *some* is "licensed" without it:

(109)   a.   I don't think that John called someone.
        b.   No one thinks that John called someone.
        c.   I am surprised that John called someone.
        d.   I regret that I called someone.
        e.   If we call someone, we'll get help.
        f.   Most boys who called someone …
        g.   Some boys called someone.
        h.   Few boys called someone.

Nonemphatic *some* thus appears freely in any context, regardless of veridicality or monotonicity, and it behaves in all respects like a "regular" indefinite (*a NP*) which can be specific (wide scope) or non-specific (narrow scope) depending on the context. There seems be nothing more interesting to non-emphatic *some*. In other words, there seem to be two varieties of *some* indefinites, an emphatic and a non-emphatic SOME, and only emphatic SOME is a PPI.

Why does emphatic SOME need to scope above negation? In my view, the most profitable avenue will be to think of SOME as an indefinite that conveys 'high' referentiality, to go back to Partee's terminology we employed in our examination of the 'low' referentiality NPIs in section 8. SOME is in contrast to those non-deictic indefinites, and which can never be interpreted deictically. If high referentiality relates to specificity — since specific indefinites are also forced to scope above negation and intentional operators, as is well known — then the use of SOME can be seen as some kind of specificity marking on the NP, akin to using, e.g., *certain*, or *particular*. Notice their parallel wide scope with negation:

(110)   a.   Sue didn't talk to a certain Norwegian — his name is Otto.
        b.   Sue didn't talk to a particular Norwegian — his name is Otto.
        c.   Sue didn't talk to SOME Norwegian — his name is Otto.

A certain, a particular, and *SOME* all want to escape negation, and a next task may be to examine whether SOME and *a certain/a particular* also pattern alike in other cases where wide scope is forced for the specific indefinites: with intensional contexts, and interaction with other quantifiers.

(111)   Every student visited SOME museum.   (a specific museum only)

Inverse scope seems indeed to be favored with SOME here, according to the judgment of the five native speakers I checked with. Yet more precise work is needed to establish the extent of the parallelism between emphatic SOME and specific indefinites like *a certain.* (With intensional verbs, for instance, forced specificity is less obvious: *The committee wants to hire SOME candidate* is a bit odd to begin with; but this could also be due to blocking by *a certain,* or additional dimensions in the meaning of SOME.) At any rate, I think it is fair to say that the idea that emphatic SOME is a highly referential or specific expression, helps us understand better its PPI property: i.e., why it needs to be interpreted with wide scope with respect to negation.

9.2.   Speaker oriented adverbs as PPIs

Speaker oriented adverbs have been analyzed recently as polarity items by Nilsen (2003) and Ernst (2009). The main observation here too is that these adverbs are incompatible with the scope of local negation, as illustrated here with *unfortunately*, which Ernst calls strong *evaluative,* and the epistemic modal adverb *possibly*:

(112)   a.   Unfortunately, John disappeared.
        b.   #John didn't unfortunately disappear.

(113)   a.   John possibly left the country.
        b.   #John didn't possibly leave the country.

The positive sentence says that John disappeared and that this is unfortunate for the speaker. The negation of this sentence ought to express truth reversal: John did not disappear and this is not unfortunate. Rather than saying this, however, the negative sentence comes out odd. Similarly with *possibly.*

Evaluative adverbs like *unfortunately, luckily, possibly* are PPIs, Ernst argues, because they expresses subjectivity. He distinguishes three types of speaker oriented adverbs, two of which are subjective and thus PPIs (Ernst 2009: (61)):

(114)   Strong PPIs: Subjective. Blocked in all nonveridical contexts. Indirect licensing disallowed.
        Weak PPIs: subjective or objective. Blocked in antiveridical context, allowed sometimes in nonveridical non-negaitve context. Indirect licensing allowed.
        Non-PPIs: Objective. Allowed in all nonveridical contexs.

We see here the correlation between subjectivity and PPI status. Upon uttering
    (112a), the speaker is committed to the truth of John's disappearing, and further asserts that this *fact* is unfortunate. I am giving below the formulations from Ernst (2009 (62)):

(115)   Subjectivity (for speaker orientation)   (Ernst 2009: (62))
        Where a speaker asserts Q= ADV(p) (thus Q is in $M_E(s)$),
        (a)   ADV is subjective iff all the worlds by which Q is evaluated are consistent
              with respect to $M_E(s)$ at the time of utterance; otherwise ADV is objective.

(b) Consistency: a set of worlds (q-worlds) is consistent with a belief state M if the proposition q is true both in q-worlds and in all the worlds in M.

Subjectivity thus formulated renders evaluative adverbs veridical; recall that factive expressions (e.g., verbs) are veridical too.

(116) $[\![$John has unfortunately disappeared$]\!]_c = 1$ iff
$\forall w \ [w \in M_E \ (\text{speaker}) \rightarrow w \in \ \lambda w'.\text{John disappeared in } w']$

Every world in the speaker's epistemic model is a world where John disappeared. From this, incompatibility with negation follows: negation would require that the proposition be false in all the worlds, and this leads to a contradiction. This type of reasoning predicts oddity and not ungrammaticality, and this is precisely the status that

(112b) with illicit *unfortunately*, as indicated. The truth condition for epistemic speaker oriented adverbs like *possibly* also requires truth commitment, to the main proposition but not in in M_E(speaker); rather, in the hearer's epistemic model (Ernst 2009: 30).

In Ernst's analysis, nonveridical sentences — questions, conditionals, etc. — will be problematic for *unfortunately* and generally adverbs of this category:

(117)   a.   #Has he unfortunately disappeared?
        b.   #If he has unfortunately disappeared…

Nonveridical contexts allow some worlds in M_E (speaker) to not be *p*-worlds, and this again conflicts with the truth condition (116) of the strong PPI *unfortunately*. Factive adverbs like *unfortunately*, then, are veridical and will only be usable in veridical contexts.

Ernst further shows that there is variation within the adverb PPI class — *unfortunately* is excluded from all nonveridical contexts, but epistemic modal adverbials (*possibly*), and what he calls *weak evaluatives* (*mysteriously*) can appear in questions and the antecedent of conditionals given certain conditions. Below, I give Ernst's chart which summarizes the variation, and some examples from his paper to illustrate:

(118)   *Ernst (2009):*

Tab. 1

Adverb type	Regular negation	Questions/ conditionals	Negative questions	Negative counterfactuals	Low-tone denial MN	Other metalinguistic negation (MN)
a. Strong evaluatives (*unfortunately, luckily*)	*	*	*	*	*	OK
b. Weak evaluatives (*mysteriously, conveniently*)	*	*/OK	OK	OK	OK	OK
c. Modals (*probably, possibly*)	*	*/OK	?/OK	*/OK	OK	OK
d. Evidentials (*clearly, obviously*)	OK	OK	OK	OK	OK	OK

(119)   a.   Are they *probabl*y going to be invited to the meeting?
        b.   Where have they *probably* put the loot?
        c.   #Are they *unbelievably* going to be invited to the meeting?

(120)   a.   If, as you say, they're *probably* in line for an award, maybe we should get
             tickets for the ceremony as soon as we can.
        b.   If they have *conveniently* decided to withdraw, the competition will go better
             for us.
        c.   # If they have *luckily* decided to withdraw, the competition will go better for
             us.

Notice that strong evaluatives remain consistently odd in questions, conditionals. This
contrast and variation, unnoticed in Nilsen (2003), suggests that not all speaker ori-
ented adverbs express full speaker commitment; *mysteriously, probably* can be seen as
expressing partial commitment, hence the truth of *p* does not hold in all worlds in M_E
(speaker), but in a subset of this model (a view, I think, consistent with Ernst's). This
predicts incompatibility with negation, but greater flexibility with respect to nonveridical
operators. Evidentials adverbs, on the other hand, are objective: they rely on evidence
for the truth of *p* outside the speaker's beliefs. If speaker commitment is the source of
PPI-status, we thus capture nicely the fact that evidential adverbs are *not* PPIs (and are
fine with negation):

(121)   John didn't *clearly* express his desires.

Space prevents me from elaborating more on these very interesting ideas (see Ernst's
paper for more details). The two important things to emphasize is that variation in the
PPI domain, and speaker commitment are the keys to understanding the incompatibility
of speaker oriented adverbial PPIs with negation and other nonveridical operators.
    One final point worth highlighting is that scalarity is not relevant for speaker oriented
adverbs — see Ernst's extensive arguments (Ernst 2009: 528–532 against Nilsen's *domain
narrowing* analysis). Ernst's main objections are that there is no evidence that the adver-
bial itself contains a scalar component in its meaning. Additionally, Nilsen discusses only
possibly, and it is not obvious how his approach would extend to the larger and more
varied class of adverbs we observe generally. In the end, the scalar approach would fail
even with the epistemic ones like *possibly*, as this type of adverbial is actually OK in the
scope of DE operators:

(122)   One often hears the term "responsible pharmacist" but few *probably* take time to
        explore its meaning. (Ernst 2009: (87a)).

(123)   * One often hears the term "responsible pharmacist" but few *strangely* take time
        to explore its meaning. (Ernst 2009: (88a)).

Notice the contrast with the evaluative *strangely* which remains odd in the scope of the
non-veridical DE *few*. Regarding *probably,* the question is, if it is scalarity that rules out
this type of adverb with negation, why do we get this contrast between negation and a

DE quantifier? Scalar items are expected to be equally good, or bad, in negative and DE contexts.

10. Main conclusions

In this paper, we reviewed a number of classical patterns of NPIs and PPIs, and the main conclusions to be drawn from our discussion are the following. First, polarity patterns within and across languages reveal two main kinds of sensitivity: (a) a more narrow sensitivity to negation and antiveridicality, and (b) a broader sensitivity to nonveridicality. The former characterizes a class of NPIs and PPIs that have very strict distribution, and is often realized also as a syntactic dependency (agreement or QR) in the case of NPIs. Sensitivity to negation also explains the incompatibility of referential PPIs (emphatic SOME) with negation, and the strongly evaluative (thus subjective) speaker oriented adverbs that need, as a class, to avoid the scope of negation.

Importantly, we saw that mere downward entailment is only a very weak NPI licenser, and often, hardly a licenser (Greek, Salish, Chinese and Korean NPIs, Dutch *ook maar,* and similar items). For PPIs, mere DE plays no role (Szabolcsi 2004; Ernst 2009). In this case, referentiality and (speaker) commitment to the truth of the embedded proposition were shown to be the decisive lexical properties of PPIs — those that make them resist the scope of negation (emphatic SOME), and other nonveridical operators (speaker oriented adverbs).

We also found that the scalarity based approaches to NPIs cannot provide a conceptually or analytically secure foundation for a unifying explanation of why NPIs, including *any,* appear in nonveridical contexts generally. At most, they predict a sensitivity to negation for those NPIs that can be seen as scalar, but even in these cases, we saw that distribution exceeds negation and DE considerably (recall *any,* English minimizers, and Lahiri's Hindi NPIs the distribution of which ranges through modalities, questions, propositional attitudes and other nonveridical contexts). We also saw that it is not even clear that *any* itself is a scalar NPI — recall the objections voiced in Duffley & Larivée (2010) (along with similar objections in various places in the earlier literature). At the same time, purely pragmatic approaches, in all varieties — widening and strengthening, EVEN based, entropy based — predict illicit NPIs to be merely uninformative or contradictory, when, in fact, they are ungrammatical. These approaches are also unable to capture why some scalar expressions are good with negation (NPIs), but some others are not (FCIs).

Finally, the scalar approach does not seem to be a plausible theory for NPIs that are not scalar, or for scalar NPIs, like Israel's 2004 *attenuating* NPIs ("long", "much", "yet", "in weeks") which do not yield a stronger negative assertion, as expected strengthening/widening in all forms, but a weakened one. The existence of such paradigms renders any attempt to unify all NPI phenomena under scalarity and strength simply untenable.

I suggested, following my earlier work, that it is empirically and analytically more attractive to think of polarity phenomena as a family of dependencies to nonveridicality (negation and DE included), with two possible lexical sources for NPIs: scalarity, and referential deficiency. Scalar NPIs sometimes contain EVEN, and we need a refined enough theory that will allow distinct and varied distributions of NPIs containing EVEN expressions (Giannakidou 2007a). At the same time, expressions can become NPIs because of

some sort of referential defficiency they contain. I argued that NPIs like *kanenas*, *any, ku,* and similar items, are variable contributing expressions that are "special" in that they cannot introduce a discourse referent in the main context, they cannot assert existence of an object. One way to capture this is to say that their variable is non-deictic, and can therefore *not* be interpreted as a free variable receiving a contextual value. FCIs contain a similar non-deictic world variable, and the subjunctive mood is a non-deictic tense in exactly the same way (Giannakidou 2009). This inability to introduce a discourse referent in the main context renders the expressions that contain non-deictic variables unusable in veridical contexts.

Conceptually, the existence of expressions that have an inherent inability to refer should not come as a surprise. Certainly, anaphoric pronouns are expressions that cannot refer without an antecedent; and so are bare nominals (singulars, in particular) in many languages, and other, case marked, narrow scope NPs (in Finish, Turkish, the genitive of negation in Russian, see Borschev et al. 2008, Partee & Borschev 2004 and earlier work by Paducheva cited there). What I suggested in Giannakidou (1998), and reiterate here, is that a central portion of polarity phenomena has to do with this difficulty, or uncertainty, in referring. With elemetns like *any*, deficient reference may also combine with a scalar component (maybe an implicature, because it is certainly not present in all contexts).

I would like to close with a word of caution. The process on NPI creation and use must be seen as a dynamic one, as patterns do not remain stable over time (Hoeksema 2010), and distributions of the same NPI classes are synchronically rarely completely identical across languages. Nonveridicality, scalarity, and non-deictic reference must thus be seen as predictors of where NPI *could* occur, not as rigid preconditions that NPIs *must* occur in *all* nonveridical environments.

Acknowledgment

11. References

Alonso-Ovalle, Luis & Paula Menéndez-Benito 2010. Modal indefinites. *Natural Language Semantics* 18, 1–31.

Anagnostopoulou, Elena & Anastasia Giannakidou 1995. Clitics and prominence; or why specificity is not enough. In: A. Dainora et al. (eds.). *Proceedings of the Annual Meeting of the Chicago Linguistic Society (= CLS) 31*. Chicago, IL: Chicago Linguistic Society, 132–150.

Atlas, Jay D. 1993. The importance of being only: Testing the neo-gricean versus neo-entailment paradigms. *Journal of Semantics* 10, 301–318.

Atlas, Jay D. 1996. *Only* noun phrases, pseudo-negative quantifiers, negative polarity items, and monotonicity. *Journal of Semantics* 13, 265–328.

Baker, Carl L. 1970. Double negatives, *Linguistic Inquiry* 1, 169–186.

Beaver, David & Brady Clark 2003. *Always* and *only*: Why not all focus sensitive operators are alike. *Natural Language Semantics* 11, 323–362.

Bernardi, Raffaella 2002. *Reasoning with Polarity in Categorial Type Logic*. Ph.D. dissertation. University of Utrecht.

Bittner, Maria 1987. On the semantics of Greenlandic antipassive and related constructions. *International Journal of American Linguistics* 53, 194–231.

Borkin, Ann 1971. Polarity items in questions. In: *Proceedings of the Annual Meeting of the Chicago Linguistics Society (= CLS) 7*. Chicago, IL: Chicago Linguistics Society, 53–62.

Borschev, Vladimir, Elena V. Paducheva, Barbara H. Partee, Yakov G. Testelets & Igor Yanovich 2008. Russian genitives, non-referentiality, and the property-type hypothesis. In: A. Antonenko J. F. Bailyn & Ch. Bethin (eds.). *Proceedings of the Formal Approaches to Slavic Linguistics: The Stony Brook Meeting 2007 (= FASL) 16*. Ann Arbor, MI: Michigan Slavic Publishers, 48–67.

Carlson, Greg 1977. *Reference to Kinds in English*. Ph.D. dissertation. University of Massachusetts, Amherst, MA.

Cheng, Lisa L.-Ch. & Anastasia Giannakidou 2011. The non-uniformity of wh-indeterminates with polarity and free choice in Chinese. To appear in: K.-H. Gil & G. Tsoulas (eds.). *Crosslinguistic Patterns of Quantification*. New York: Oxford University Press.

Chierchia, Gennaro 2006. Broaden your views. Implicatures of domain widening and the "Logicality" of language. *Linguistic Inquiry* 37, 535–590.

Condoravdi, Cleo 1994. *Descriptions in Context*. Ph.D. dissertation. Yale University, New Haven, CT.

van Craenenbroek, Jeroen 2008. About something. Towards a syntactic decomposition of polarity. Paper presented at the *CUNY Syntax Supper*, CUNY Graduate Center at the City University of New York, November 25, 2008.

Davison, Alice 1981. *Any* as universal or existential. In: J. van der Auwera (ed.). *The Semantics of Determiners*. London: Croom Helm, 11–34.

Dayal, Veneeta 1998. *Any* as inherently modal. *Linguistics & Philosophy* 21, 433–476.

Den Dikken, Marcel & Anastasia Giannakidou 2002. From *hell* to polarity: Aggressively non-d-linked wh-phrases as polarity items. *Linguistic Inquiry* 33, 31–61.

Dowty, David 1994. The role of negative polarity and concord marking in natural language reasoning. In: M. Harvey & L. Santelmann (eds.). *Proceedings of Semantics and Linguistic Theory (= SALT) IV*. Ithaca, NY: Cornell University, 114–145.

Drenhaus, Heiner, Peter beim Graben, Stefan Frisch, Douglas Saddy 2006. Diagnosis and repair of negative polarity constructions in the light of symbolic resonance analysis. *Brain & Language* 96, 255–268.

Drenhaus, Heiner, Joanna Blaszczak & Juliane Schütte 2010. *An ERP Study on the Strength of Licensers in Negative Polarity Constructions*. Ms. Potsdam, University of Potsdam.

Duffley, Patrick & Pierre Larivée 2010. Anyone for non-scalarity? *English Language and Linguistics* 14, 1–17.

Enç, Mürvet 1991. The semantics of specificity. *Linguistic Inquiry* 22, 1–25.

Ernst, Thomas 2009. Speaker oriented adverbs. *Natural Langauge and Lingusitic Theory* 27, 497–544.

Falaus, Anamaria 2009. *Polarity Items and Dependent Indefinites in Romanian*. Ph.D. dissertation. Université de Nantes.

Farkas, Donka F. 1998. Dependent indefinites. In: F. Corblin, D. Goddard & J.-M. Marandin (eds.). *Empirical Issues in Formal Syntax and Semantics.* Frankfurt/M.: Peter Lang, 243–267.

Farkas, Donka F. 2002. Extreme non-specificity in Romanian In: C. Beyssade et al. (eds.). *Romance Languages and Linguistic Theory 2000*. Amsterdam: Benjamis, 127–151.

Fauconnier, Gilles 1975. Pragmatic scales and logical structure. *Linguistic Inquiry* 6, 353–375.

Fernald, Theodore B. & Ellavina Perkins 2006. Negative polarity items in Navajo. In: A. Berez, S. Gessner & S. Tuttle (eds.). *Proceedings of the Dene (Athabaskan) Languages Conference (= ALC) 2006* (Alaska Native Language Center Working Papers 7). Fairbanks, AK: ANLC Publications, 19–48.

von Fintel, Kai 1999. NPI-licensing, Strawson-entailment, and context-dependency. *Journal of Semantics* 16, 97–148.

von Fintel, Kai 2000. Whatever. In: B. Jackson & T. Matthews (eds.). *Proceedings of Semantics and Linguistic Theory (= SALT) X*. Ithaca, NY : Cornell University, 27–40.

van Geenhoven, Veerle 1998. *Semantic Incorporation and Indefinite Descriptions: Semantic and Syntactic Aspects of Noun Incorporation in West Greenlandic*. Doctoral dissertation. University of Tübingen. Reprinted: Stanford, CA: CSLI Publications.

Giannakidou, Anastasia 1994. The semantic licensing of NPIs and the Modern Greek subjunctive. *Language and Cognition* 4, 55–68.

Giannakidou, Anastasia 1995. Subjunctive, habituality and negative polarity. In: M. Simons & T. Galloway (eds.). *Proceedings of Semantics and Linguistic Theory (= SALT) V*. Ithaka, NY: Cornell University, 132–150.

Giannakidou, Anastasia 1997. *The Landscape of Polarity Items.* Ph.D. dissertation. University of Groningen.

Giannakidou, Anastasia 1998. *Polarity Sensitivity as (Non)veridical Dependency*. Amsterdam: Benjamins.

Giannakidou, Anastasia 1999. Affective dependencies. *Linguistics & Philosophy* 22, 367–421.

Giannakidou, Anastasia 2000. Negative … Concord? *Natural Language and Linguistic Theory* 18, 457–523.

Giannakidou, Anastasia 2001. The meaning of free choice. *Linguistics & Philosophy* 24, 659–735.

Giannakidou, Anastasia 2002. Licensing and sensitivity in polarity items: From downward entailment to nonveridicality. In: M. Andronis, A. Pycha & K. Yoshimura (eds.). *Proceedings of the Annual Meeting of the Chicago Linguistic Society (= CLS) 38*. Chicago, IL: Chicago Linguistic Society, 29–53.

Giannakidou, Anastasia 2006. *Only,* emotive factive verbs, and the dual nature of polarity dependency. *Language* 82, 575–603.

Giannakidou, Anastasia 2007a. The landscape of EVEN. *Natural Language and Linguistic Theory* 25, 39–81.

Giannakidou, Anastasia 2007b. *The ingredients of free choice*. Paper presented at the *Workshop on Different Kinds of Specificity Across Languages: Funny Infinitives*, July 6–7, 2007, SFB 632 *Information Structure,* Zentrum für Allgemeine Sprachwissenschaft (ZAS), Berlin.

Giannakidou, Anastasia 2009. The dependency of the subjunctive revisited: Temporal semantics and polarity. *Lingua* (special issue on *Mood*) 119, 1883–1908.

Giannakidou, Anastasia 2011. Greek quantifiers. To appear in: E. L. Keenan & D. Paperno (eds.). *Handbook of Quantifiers in Natural Language*. Dordrecht: Springer.

Giannakidou, Anastasia & Lisa Cheng 2006. (In)definiteness, polarity, and the role of wh-morphology in free choice. *Journal of Semantics* 23, 135–183.

Giannakidou, Anastasia & Josep Quer 1995. Two mechanisms for the licensing of negative indefinites. In: L. Gabriele, D. Hardison & R. Westmoreland (eds.). *Proceedings of the Annual Meeting of the Formal Linguistics Society of Mid-America (= FLSM) 6, vol. 2: Syntax II & Semantics/ Pragmatics*. Bloomington, IN: IULC Publications, 103–114.

Giannakidou, Anastasia & Josep Quer 1997. Long distance licensing of negative indefinites. In: D. Forget et al. (eds.). *Negation and Polarity, Syntax and Semantics*. Amsterdam: Benjamins. 95–113.

Giannakidou, Anastasia & Josep Quer 2010. What we gain, and what we lose, with a Hamblin semantics for free choice: From free choice to referential vagueness. Paper presented at the *Workshop on Alternative-Based Semantics*, University of Nantes, October 29–30, 2010.

Giannakidou, Anastasia & Suwon Yoon 2010. No NPI licensing in comparatives. Paper presented at the *Annual Meeting of the Chicago Linguistic Society (= CLS) 46*, April 8–10, 2010.

Guerzoni, Elena 2004. EVEN-NPIs in questions. *Natural Language Semantics* 12, 319–343.

Guerzoni, Elena & Yael Sharvit 2007. A question of strength: On NPIs in interrogative clauses. *Linguistics & Philosophy* 30, 361–391.

Haegeman, Liliane & Rafaella Zanuttini 1981. Neg-heads and the neg-criterion. *The Linguistic Review* 8, 233–251.

Haspelmath, Martin 1997. *Indefinite Pronouns*. Oxford: Oxford University Press.

Heim, Irene 1982. *The Semantics of Definite and Indefinite Noun Phrases*. Ph.D. dissertation. University of Massachussetts, Amherst, MA. Reprinted: Ann Arbor, MI: University Microfilms.

Heim 1984. A note on negative polarity and downward entailingness. In: C. Jones & P. Sells (eds.). *Proceedings of the North Eastern Linguistic Society (=NELS) 14*. Amherst, MA: GLSA, University of Massachussetts, 98–107.

Herburger, Elena 2003. A note on Spanish *ni siquiera, even,* and the analysis of NPIs. *Probus* 15, 237–256.

Herburger, Elena & Simon Mauck 2006. NPIs are low Scalar Items +F. Ms. Washington, DC, Georgetown University.

Hintikka, Jaakko 1962. *Knowledge and Belief: An Introduction to the Logic of the Two Notions*. Ithaka, NY: Cornell University Press.

Hoeksema, Jacob 1986. Monotonie en superlatieven. In: C. Hoppenbrouwers et al. (eds.). *Proeven van taalwetenschap*. Groningen: Instituut RUG, 38–49.

Hoeksema, Jacob 1994. On the grammaticalization of negative polarity items. In: S. Gahl, A. dolbey & C. Johnson (eds.). *Proceedings of the Annual Meeting of the Berkeley Linguistics Society (= BLS) 20*. Berkeley, CA: Berkeley Linguistics Society, 273–282.

Hoeksema, Jacob 1999. Aantekeningen bij *ooit*, deel 2: De opkomst van niet polair ooit. *Tabu* 29, 147–172.

Hoeksema, Jacob 2010. Dutch ENIG: From nonveridicality to downward entailment. *Natural Language and Linguistic Theory* 28, 837–859.

Hoeksema, Jacob & Hotze Rullmann 2001. Scalarity and polarity: A study of scalar adverbs as polarity items. In: J. Hoeksema et al. (eds.). *Perspectives on Negation and Polarity Items*. Amsterdam: Benjamins, 129–171.

de Hoop, Helen 1992. *Case Configuration and Noun Phrase Interpretation*. Ph.D. dissertation. University of Groningen.

Horn, Laurence 1972. *On the Semantic Properties of Logical Operators in English*. Ph.D. dissertation. University of California, Los Angeles, CA.

Horn, Laurence R. 1989. *A Natural History of Negation*. Chicago, IL: The University of Chicago Press.

Horn, Laurence R. 1996. Exclusive company: *Only* and the dynamics of vertical inference. *Journal of Semantics* 13, 1–40.

Horn, Laurence R. 2000a. *Any* and *(–)ever*: Free choice and free relatives. In: A. Z. Wyner (ed.). *Proceedings of the Annual Meeting of the Israel Association for Theoretical Linguistics (= IATL) 15*. Jerusalem: Akademon, 71–111.

Horn, Laurence R. 2000b. Pick a theory: Not just any theory. In: L. Horn & Y. Kato (eds.). *Negation and Polarity: Syntactic and Semantic Perspectives*. Oxford: Oxford University Press, 147–192.

Horn, Laurence R. 2002. Assertoric inertia and NPI-licensing. In: M. Andronis et al. (eds.). *Proceedings of the Annual Meeting of the Chicago Linguistic Society (= CLS) 38, Parasession on Negation and Polarity*. Chicago, IL: Chicago Linguistic Society, 55–82.

Horn, Laurence R. 2005. Airport '86 revisited: Toward a unified indefinite *any*. In: G. Carlson & F. J. Pelletier (eds.). *The Partee Effect*. Stanford: CSLI Publications, 179–205.

Horn, Laurence R. 2006. The boarder wars: A neo-Gricean perspective. In: K. von Heusinger & K. Turner (eds.). *Where Semantics Meets Pragmatics.* Amsterdam: Elsevier, 21–48.

Israel, Michael 1996. Polarity sensitivity as lexical semantics. *Linguistics & Philosophy* 19, 619–666.

Israel, Michael 2004. The pragmatics of polarity. In: L. Horn & G. Ward (eds.). *The Handbook of Pragmatics.* Oxford: Blackwell, 701–723.

Jackson, Eric. 1994. *Negative Polarity, Definites under Quantification and General Statements.* Ph.D. dissertation. Stanford University, Stanford, CA.

Jacobson, Pauline 1995. On the quantificational force of the English free relative. In: A. Kratzer et al. (eds.). *Quantification in Natural Language, Vol. 2.* Dordrecht: Kluwer, 451–487.

Jayez, Jacques & Lucia Tovena 2005. Free choiceness and non-individuation. *Linguistics & Philosophy* 28, 1–71.

Jespersen, Otto 1909–1949. *A Modern English Grammar on Historical Principles*. London: George Allen and Unwin Ltd.

Kadmon, Nirit & Fred Landman 1993. Any. *Linguistics & Philosophy* 16, 353–422.

Kas, Mark 1993. *Essays on Boolean Semantics and Negative Polarity.* Ph.D. dissertation. University of Groningen.

Kiparsky, Paul 1998. Partitive case and aspect. In: M. Butt & W. Geuder (eds.). *The Projection of Arguments: Lexical and Compositional Factors*. Stanford, CA: CSLI Publications, 265–307.

Klima, Edward 1964. Negation in English. In: J. Fodor & J. Katz (eds.). *The Structure of Language*. Englewood Cliffs, NJ: Prentice Hall, 246–323.

Kratzer, Angelika & Shimoyama, Junko 2002. Indeterminate pronouns: The view from Japanese. In: Y. Otsu (ed.). *Proceedings of the Tokyo Conference on Psycholinguistics 3*. Tokyo: Hituzi Syobo, 1–25.

Krifka, Manfred 1995. The semantics and pragmatics of polarity items in assertion. *Linguistic Analysis* 15, 209–257.

Krifka, Manfred, Francis J. Pelletier, Greg Carlson, Alice ter Meulen, Gennaro Chierchia & Godehard Link 1995. Genericity: An introduction. In: G. Carlson & F. J. Pelletier (eds.). *The Generic Book.* Chicago: The University of Chicago Press, 1–124.

Ladusaw, William 1980. *Polarity Sensitivity as Inherent Scope Relations*. New York: Garland.

Ladusaw, William 1983. Logical form and conditions on grammaticality. *Linguistics & Philosophy* 6, 373–392.

Ladusaw, William 1996. Negation and polarity items. In: S. Lappin (ed.). *The Handbook of Contemporary Semantic Theory*. Oxford: Blackwell, 321–341.

Lahiri, Utpal 1998. Focus and negative polarity in Hindi. *Natural Language Semantics* 6, 57–123.

Laka, Itziar 1990. *Negation in Syntax: On the Nature of Functional Categories and Projections.* Ph.D. dissertation. MIT, Cambridge, MA.

Lee, Chungmin 1997. Negative polarity and free choice: Where do they come from? In: P. Dekker, M. Stokhof & Y. Venema (eds.). *Proceedings of the Amsterdam Colloquium 11*. Amsterdam: ILLC, 217–222.

Lee, Chungmin 1999. Types of NPIs and nonverdicality in Korean and other languages. In: G. Storto (ed.). *Syntax at Sunset 2* (UCLA Working Papers in Linguistics 3). Los Angeles, CA: University of California, 96–132.

Lee, Chungmin 2003. Negative polarity items and free choice in Korean and Japanese: A contrastive study. *Korean Society of Bilingualism* 22.

Lee, Jung-Hyuck 2010. Nonveridical dependency: Korean and Japanese focus particles. *Japanese/Korean Linguistics* 17, 231–245.

Lee, Young-Suk & Laurence R. Horn 1994. *Any* as an Indefinite plus *even*. Ms. New Haven, CT, Yale University.

Lin, Jo-Wang 1996. *Polarity Licensing and Wh-Phrase Quantification in Chinese*. Ph.D. dissertation. University of Massachusetts, Amherst, MA.

Linebarger, Marcia 1980. *The Grammar of Negative Polarity*. Ph.D. dissertation. MIT, Cambridge, MA.

Linebarger, Marcia 1987. Negative polarity and grammatical representation. *Linguistics & Philosophy* 10, 325–387.

Linebarger, Marcia 1991. Negative polarity as lingusitic evidence. In: L. M. Dobrin, L. Nichols & R. Rodriguez (eds.). *Proceedings of the Annual Meeting of the Chicago Linguistic Society (= CLS) 27, Part Two: The Parasession on Negation*. Chicago, IL: Chicago Linguistic Society, 165–188.

Matthewson, Lisa 1998. *Determiner Systems and Quantificational Strategies. Evidence from Salish*. The Hague: Holland Academic Graphics.

Menéndez-Benito, Paula 2010. On universal free choice items. *Natural Language Semantics* 18, 33–64.

Merchant, Jason 2004. Fragments and ellipsis. *Linguistics & Philosophy* 27, 661–738.

Montague, Richard 1969. On the nature of certain philosophical entities. *The Monist* 53, 159–194.

Nakanishi, Kimiko 2007. Presentation at the *Annual Meeting of the Linguistic Society of America (= LSA), Workshop on Semantic/Pragmatic Perspectives on Negative Polarity Items*, January 4–7, 2007.

Nathan, Lance 1999. *Either: Negative Polarity Meets Focus Sensitivity*. Honors Thesis. Brown University, Providence, RI.

Nilsen, Oystein 2003. *Eliminating Positions*. Ph.D. dissertation. University of Utrecht.

Park, Eun-Hae. 2009. Free choice and wh-indeterminates in Korean: Definiteness, indefinites, and expressive content. Ph.D. dissertation. University of Chicago, Chicago, IL.

Partee, Barbara H. 2008. Negation, intensionality, and aspect: Interaction with NP semantics. In: S. Rothstein (ed.). *Theoretical and Crosslinguistic Approaches to the Semantics of Aspect*. Amsterdam: Benjamins, 291–317.

Partee, Barbara H. & Vladimir Borschev 2004. The semantics of Russian genitive of negation: The role and nature of perspectival structure. In: K. Watanabe & Robert B. Young (eds.). *Proceedings of Semantics and Linguistic Theory (= SALT) XIV*. Ithaca, NY: Cornell University, 212–234.

Pereltsvaig, Asya 2000. Monotonicity-based versus veridicality-based approaches to negative polarity: Evidence from Russian. In: T. Halloway King & I. A. Sekerina (eds.). *Formal Approaches to Slavic Linguistics: The Philadelphia Meeting 1999*. Ann Arbor, MI: Michigan Slavic Publishers, 328–346.

Pereltsvaig, Asya 2008. Russian *nibud'*-series as markers of co-variation. In: N. Abner & J. Bishop (eds.). *Proceedings of the West Coast Conference on Formal Linguistics (= WCCFL) 27*. Somerville, MA: Cascadilla Proceedings Project, 370–378.

Postal, Paul M. 2000. *The Ohio Lectures on squat*. Ms. New York, New York University.

Postal, Paul M. 2003. *Skeptical Linguistic Essays*. New York: Oxford University Press.

Potts, Christopher 2005. *The Logic of Conventional Implicatures*. Oxford: Oxford University Press.

Progovac, Ljiljana 1994. *Positive and Negative polarity: A binding approach*. Cambridge: Cambridge University Press.

Progovac, Ljiljana 2005. Negative and positive feature checking and the distribution of polarity items. In: S. Brown & A. Przepiorkowski (eds.). *Negation in Slavic*. Bloomington, IN: Slavica Publishers, 179–217.

Przepiórkowski, Adam & Anna Kupc 1997. Eventuality negation and negative concord in Polish and Italian. In: R. D. Borsley & Adam Przepiórkowski (eds.). *Slavic in Head-Driven Phrase Structure Grammar*. Stanford, CA: CSLI Publications, 211–246.

Quer, Josep 1998. *Mood at the Interface*. Ph.D. dissertation. University of Utrecht.

Quer, Josep 1999. *The Quantificational Force of Free Choice Items*. Ms. Amsterdam, University of Amsterdam.

Rooth, Mats 1985. *Association with Focus*. Ph.D. dissertation. University of Massachusetts, Amherst, MA.

van Rooy, Robert 2003. Negative polarity items in questions: Strength as relevance. *Journal of Semantics* 20, 239–273.

Rullmann, Hotze 2003. Additive particles and polarity. *Journal of Semantics* 20, 329–401.

Saddy, Douglas, Heiner Drenhaus & Stefan Frisch 2004. Processing polarity items: Contrastive licensing costs. *Brain & Language* 90, 405–502.

Sailer, Manfred 2009. On reading-dependent licensing of strong negative polarity items. In: A. Riester & T. Solstad (eds.). *Proceedings of Sinn and Bedeutung (= SuB) 13*. Stuttgart: University of Stuttgart, 455–468.

Seuren, Pieter 1984. The comparative revisited. *Journal of Semantics* 3, 109–141.

Shimoyama. Junko 2003. *Wide Scope Universals in Japanese*. Ms. Montreal, McGill University.

Stalnaker, Robert 1979. Assertion. In: P. Cole (ed.). *Syntax and Semantics 9: Pragmatics*. New York: Academic Press, 315–332.

Suranyi, Balazs 2006. Quantification and focus in negative concord. *Lingua* 116, 272–313.

Szabolcsi, Anna 2004. Positive polarity – negative polarity. *Natural Language and Linguistic Theory* 22, 409–452.

Tancredi, Christopher 2007a. *A Multi-Model Modal Theory of I-Semantics, Part I: Modals*. Ms. Tokyo, University of Tokyo.

Tancredi, Christopher 2007b. *A Multi-Model Modal Theory of I-Semantics, Part II: Identity and Attitudes*. Ms. Tokyo, University of Tokyo.

Tovena, Lucia 1998. *The Fine Structure of Polarity Items*. New York: Garland.

Uribe-Etxebarria, Miriam 1994. *Interface Licensing Conditions on Negative Polarity Licensing: A theory of Polarity and Tense Interactions*. Ph.D. dissertation. University of Connecticut, Storrs, CT.

Vendler, Zeno 1967. *Linguistics in Philosophy*. Ithaka, NY: Cornell University Press.

Vlachou, Evangelia 2007. *Free Choice Items In and Out of Context*. Ph.D. dissertation. University of Utrecht.

van der Wouden, Ton. 1994. *Negative Contexts*. Ph.D. dissertation. University of Groningen.

Yoon, Suwon 2008. *From Non-Specificity to Polarity: Korean N-Words*. Ms. Chicago, IL, University of Chicago.

Yoshimura, Keiko 2007. *Focus and Polarity in Japanese*. Ph.D. dissertation. University of Chicago, Chicago, IL.

Zanuttini, Raffaella 1991. *Syntactic Properties of Sentential Negation. A Comparative Studie of Romance Languages*. Ph.D. dissertation. University of Pennsylvania, Philadelphia, PA.

Zwarts, Frans 1981. Negatief polaire uitdrukkingen I. *Glot International* 4, 35–132.

Zwarts, Frans 1986. *Categoriale Grammatica en Algebraische Semantiek. Een studie naar negatie en polariteit in het Nederlands*. Ph.D. dissertation. University of Groningen.

Zwarts, Frans 1993. *Three Types of Polarity*. Ms. Groningen, University of Groningen. Reprinted in: F. Hamm & E. Hinrichs (eds.). *Plural Quantification*. Dordrecht: Kluwer, 1998, 177–238.

Zwarts, Frans 1995. Nonveridical contexts. *Linguistic Analysis* 25, 286–312.

Anastasia Giannakidou, Chicago (USA)